STUDIES IN POLITICAL ECONOMY OF GLOBAL LABOR AND WORK | 2

WHERE SHRIMP EAT BETTER THAN PEOPLE

Globalized Fisheries, Nutritional Unequal Exchange and Asian Hunger

Wilma A. Dunaway and
Maria Cecilia Macabuac

BRILL

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In memory of
Donald Armour Clelland
(*1935–2021*)

Each mortal thing does one thing and the same.
Crying What I do is me:
For that I came.
(George Manley Hopkins)

And so you did with your insightful critical theory and your patient teaching. You challenged us to dig deeper and not to shy away from the complexities.
We loved you, and we miss your irreplaceable voice

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Go to my mountain cradle.
Go to my home and sea.
Look on my ruined forests.
And note what ye did to me.

However, we also need to thank a group of people whose identities we can publicly acknowledge. We wish to express our deep appreciation and warm affection to the many Philippine feminists, fishery/mangrove scholars, nutritional analysts, and time-analysis specialists whose published scholarship we gleaned to construct the historiography of how the Philippines was transformed into a *food extractive enclave* to feed the world. Our bibliography reflects that many of you were on the early cutting edge of concern about hunger, women's overwork, and destruction of the country's ecological resources. Your empirical and conceptual clues often guided us toward deeper, more complex questions and methodologies. We are aware that some of you took political risks by being critical, so we thank you for your brave fortitude.

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Abbreviations

ADB	Asian Development Bank
AFSIS	ASEAN Food Security Information System
APFC	Asia-Pacific Fishery Commission
BFAR	Philippine Bureau of Fisheries and Aquatic Resources
CGIAR	Consultative Group on International Agricultural Research
CRES	Certified Emissions Reductions
EBRD	European Bank for Reconstruction and Development
ESCAP	Economic and Social Commission on Asia and the Pacific, United Nations
EU	European Union
FAO	Food and Agriculture Organization
FAOSTAT	FAO Statistical Databases
GDP	Gross Domestic Product
GNI	Gross National Income
GNP	Gross National Product
IFPRI	International Food Policy Research Institute
ILO	International Labour Organization
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IRD	Institut de Recherche pour le Developpement
MDB	Multilateral Development Bank
MHHDC	Mahbub ul Haq Human Development Centre
PNAPC	Philippine Anti-Poverty Commission
PCAMRD	Philippine Council for Aquatic and Marine Research and Development
PCB	Philippine Central Bank
PDA	Philippine Department of Agriculture
PDENR	Philippine Department of Environment and Natural Resources
PFNRI	Philippine Food and Nutrition Research Institute
PIA	Philippine Information Agency
PNEDA	Philippine National Economic and Development Authority
RSSIS	Philippine Rural Sector Statistical Information System
SAPRIN	Structural Adjustment Participatory Review International Network
SEAFDEC	Southeast Asian Fisheries Development Center
SIAP	Seaweed Industry Association of the Philippines
UNDP	United Nations Development Program
UNEP	United Nations Environment Programme
UNFCC	United Nations Framework for Climate Change

US	United States
USAID	United States Agency for International Development
USAID-PH	United States Agency for International Development– Philippines
USFAS	U.S. Department of Agriculture Foreign Agricultural Service
WHO	World Health Organization
WTO	World Trade Organization

Introduction

> The shrimp live better than we do. They have electricity, but we don't. The shrimp have clean water, but we don't. The shrimp have lots of food, but we are hungry.
>
> (Environmental Justice Foundation 2003: 1)

With these words, a Philippine fisher captures the survival dilemma of Asian peasants. East, South and Southeast Asia are a world hunger paradox. The sixteen major fisheries in this region (see Table 1) produce more than three-quarters of the world's fish. They account for a majority of the world's wild seafood outputs and more than two-thirds of aquaculture production (ADB 2013). Despite economic growth rates of 5 to 8 percent over the last two decades and high levels of food production, East, South and Southeast Asia are populated by two-thirds of the world's hungry people (see Figure 1). Even though these Asians spend more than half of their household budgets on food, regional calories per capita have fallen since 2000, and the highest incidence of hunger and micronutrient deficiencies occur among Asian peasant farmers and fishers (Asia Society 2010). Because of these factual contradictions, the central question of our study is: *Why are the Asian peasants who produce and export so much of the world's food the hungriest people in the world?*

Fishery outputs are more frequently traded than any other agricultural commodities, with over 50 percent of production marketed internationally. Most of those fishery commodities are produced by the sixteen Asian fisheries. However, three-quarters of the world's extremely poor households live and work in the rural communities of these Asian fisheries. Consequently, the most malnourished households in the world are the Asian rural workers who produce and process so much of the world food supply (FAO 2012b). According to the Food and Agriculture Organization (2015: 15), "the highest burden of hunger in absolute terms is to be found in South Asia," which has exhibited only slight reduction in hunger rates since 1990. India is the country with the greatest number of undernourished people (194.6 million). In East Asia, China has 133.8 million hungry people while North Korea is "burdened by continuously high levels of undernourishment and shows little prospect of addressing its problems any time soon." Furthermore, these Asian households do not

TABLE 1 World rankings for the major Asian fisheries, 2019

Fishery territory	World rank in capture fishery production	World rank in aquaculture production	World rank in aquatic plants production	World rank in fishery exporting	World rank in no. fishing vessels	World rank in no. fishers	World rank in no. aquaculture producers
Part A. South Asia							
A [a]Bangladesh	12	5		36	12	12	5
A [a]India	3	3		3	3	3	2
A [a]Pakistan	36	28		50	35	35	30
S [a]Sri Lanka	33	46			34	34	
Part B. Southeast Asia							
A [a]Cambodia	29	26			30	30	27
S [a]Indonesia	2	2	11	12	2	2	3
M Malaysia	13	17		41	13	13	23
S Myanmar	10	11		40	9	9	9
S [a]Philippines	11	6	22	43	11	11	11
M Thailand	18	13		16	14	14	10
S Vietnam	8	4		4	8	8	4

Part C. East Asia							
M China-Mainland	1	1	4	1	1	1	1
L China-Taiwan	23	20	5	20	23	23	20
L Japan	7	12	14	22	7	7	12
S [a]North Korea	57	15					
L South Korea	17	7	15	21	18	18	14

A = ALARMING, S = SERIOUS, M = MODERATE, L = LOW

a 2010 low-income food-deficient country (FAO 2011a).

SOURCES: ANALYSIS OF FAO (2020D). THE LETTERS BEFORE NAMES REFER TO THEIR 2010 GLOBAL HUNGER INDEXES (CONCERN WORLDWIDE 2010),

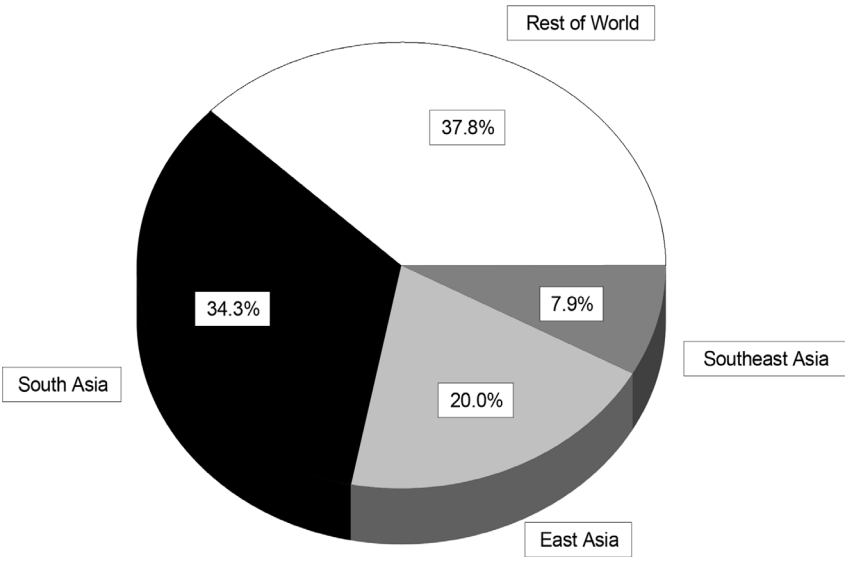

FIGURE 1 Percentage of the world's undernourished people
SOURCE: FAO 2014B

consume much of the fishery output that they produce. On average, white rice and other carbohydrates account for nearly two-thirds of household food expenditures (Asia Society 2010: 6–8).[1]

1 Scholarly Significance and Investigative Goals

We seek to fill a major gap in the social science literature and in public policy formulation. While social scientists have directed a great deal of attention to analyses of neoliberal impacts on Global South agriculture, economists and biological and management scientists have dominated the large body of literature about fisheries and aquaculture that has been published since 2000.[2] We have found only one 21st century book (Einarsson and Óladóttir 2010) that explores the centrality of fisheries to world hunger, but it does not investigate

1 Throughout this book, monetary values are $US.

2 We base this claim on our search for relevant books in the databases of commercial book sellers, of the WorldCat catalog, and of the Library of Congress and our extensive searching of library databases for journal articles.

inequalities in consumption of fishery commodities or the state of peasant fishing communities.[3]

Without addressing food security or peasant fishing communities, seven 21st century books focus on the ecological state of fisheries globally and on the externalized ecological costs of the international fishing industry (DeSombre and Barkin 2011; Jackson et al. 2012; Longo et al. 2015; Webster 2015; Bresnihan 2016; Hilborn and Hilborn 2019; Pauly 2019). Without exploring food security, one book examines governance of fisheries (Fache and Pauwels 2016), and three books (Wang 2004; Bailey 2018; Viatori and Medina 2020) analyze transformation of peasant fishing communities. Over the last three decades, two books (Howell 1995; Wang 2004) examine state mandates that led to significant economic and structural changes in two Asian fisheries, without investigating linkages to food insecurity within those fishing communities. One NGO electronic publication (Environmental Justice Foundation 2003) examines human rights violations in shrimp aquaculture, including some ethnographic attention to hunger in fishing communities, but it does not offer a systematic analysis of inequalities in access to food.

Because social scientists have largely ignored fisheries (Hersoug 2004), in-depth studies of social change and hunger in fishing communities have been very sparse since 1980 (Spoehr 1984, FAO 2005). According to scholar Daniel Pauly (2006: 9, 15–16), the focus has been upon the biological management of fisheries to the neglect of community well-being and food security because social scientists have been absent from the international scholarly debates and from public policymaking. He warns that "there is a need for social-science generlisations which is not presently met," most especially in the formulation of "people-orientated and sustainable government policies." We seek to address this gap in the social science literature and in public policy formulation through careful examination of the region of sixteen Asian fisheries that are simultaneously home to most of the world's hungry people and producers of a majority of global fishery outputs. Moreover, this Asian region is populated by thousands of small-scale fishing communities that are threatened by inequitable access to food, ecological degradation and climate change, and land and waterway dispossession caused by global and national policies that prioritize economic growth through fishery and aquaculture exporting (ADB 2013).

At the turn of the 21st century, many international development organizations advocated that food security is more efficiently attained through

3 We have not included Kent (2018) that was recently republished by Routledge without any updating of the data in the 1987 book.

exporting and importing than through transactions in domestic markets (World Food Summit 1996; Watkins 1996). In contrast to that overly-optimistic view, we introduce the notion of *food extractive enclaves* to explore how Asian fisheries have transformed their natural resources by employing imported Green, Blue and Gene Revolution technologies and chemicals to engage in *nutritional unequal exchanges* (our concept) with countries where there is little hunger. Agriculture and fisheries have been de-localized, and harvests have been standardized into a narrow menu of commodities that are in demand globally (McMichael 2005, 2008). We investigate five research questions that derive from the globalization of food production systems.

1. Why is there such a high incidence of hunger and malnutrition among Asian peasant farmers and fishers who produce so much of the food that is traded in the world economy?
2. Has international trade decreased the food insecurity of Asian fisheries?
3. To what extent do Asian fisheries produce and import foods that address their nutritional needs?
4. To what extent do Asian fisheries prioritize exports and/or nonfood uses over local consumption?
5. How have women's work and hunger been impacted by the integration of Asian fisheries into the world food trading system?

1.1 *The World Food System and Southern Hunger*

How is it possible that the world's food producers and rural households suffer the highest levels of malnutrition? The answer to this question does not lie in over-simplified, Eurocentric Malthusian claims about population growth. Indeed, the explanations for such inequalities lie in the structural mechanisms of world capitalism that have fostered "a system of global profiteering" from transnational food marketing (McMichael 1998: 104). Industrialized food production is justified as the quickest path to food security for Southern countries (Watkins 1996) when, in reality, its aim is to generate market control for multinational corporations (Baviera and Bello 2009). By the early 1980s, the value of food imports of Southern countries outstripped the value of their food exports (Constantino 1988). Consequently, Asian representatives to the 1988 World Food Congress voiced alarm about "the flooding into Third World countries of foods their farmers could produce" (*Philippine Star*, 11 April 1988: 2). Despite these concerns, the 1995 World Trade Organization (WTO) Agreement on Agriculture further constrained the ability of national governments to strategize food self-sufficiency. "Because a pivotal goal of the global agro-food system is the capture of local food markets of Southern countries, the WTO's minimum import rules require all the member states to allow imports of food

up to at least 5 percent of the volume of domestic consumption" (McMichael 2005: 277).

Throughout the Global South, food imports exacerbate national debt, alter consumption patterns, and threaten the livelihoods of local farmers. As the richer countries unload their surpluses on Southern nations, they destroy any possibility for those countries to become food self-sufficient (*New Internationalist* 1999b). By 2000, food imports comprised a significant proportion of the external debt of most Southern countries. At the same time, Asian countries received very little income for their fishery exporting. Southeast Asia accounted for 36 percent of the world's exports but received only 7 percent of total value of world fishery commodities. East Asia did a little better, providing 30 percent of world exports for 10 percent of world value. Even though 21 percent of world exports originated in South Asia, that region acquired only 4 percent of world value.[4]

Production of, access to, and control over food are managed by a global industrialized system that:

1. centralizes control of local ecological resources and food production systems into the hands of export producers and the multinational corporations with which they trade;
2. generates dependency on imported crop and fishery inputs, fossil fuels and technology;
3. degrades and depletes ecosystems, agricultural lands and fisheries;
4. depeasantizes local agricultural and fishery production;
5. globalizes access to basic necessities of survival while putting producing populations at risk of nutritional shortfalls;
6. causes widening class, gender, age and ethnic inequalities in access to food;
7. grounds food security in imports that require additional national indebtedness;
8. and entrenches poverty and hunger by exploiting millions of bonded and forced laborers (Kara 2012; Barclay 2013; Monthly *Review* special issue 50 (3); McMichael 1998, 2005, 2008; SAPRIN 2002; Shiva 2002; Akram-Lodhi and Kay 2009; Baviera and Bello 2009; Holt-Gimenez 2018).

Monocultural agriculture and aquaculture developed as a result of the Green, Blue and Genetic Revolutions that "respond to the financial needs of corporations, not to the food needs of the poor." For that reason, their science has

4 Aggregation and analysis of export data, UN COMTRADE database.

"impoverished smallholder agriculture" and "systematically destroyed farm nutrient diversity." According to Eric Holt-Gimenez (2018: 29–32, 48–49),

> The lion's share of food's value is captured by the agrifoods industry, either upstream by farm input suppliers (seed, chemical, and farm machinery), or downstream by packers, processors, and retailers. While farmers typically earned 40–50 percent of the food dollar in the 1950s, today they capture less than 20 percent. ... The food industry is highly concentrated and demands tremendous uniformity from farming. ... The standardization of food depends on single crop monocultures.

Technically, the global food system has succeeded because production has more than doubled over the last forty years. During the same time period, however, the numbers of malnourished people have either risen or stayed near the same proportions in both poor and rich countries, demonstrating the failure of the system to end world hunger (Wilkinson 2010). The Food and Agriculture Organization (2012b: 1) concedes that economic growth and globalized trade are not enough to insure that a majority of the world's people can acquire adequate nutrients. Because the world economy "determines whether or not production gets distributed to meet the needs of all" (Burback and Flynn 1980: 122), only about one-quarter of the world population benefits from globalized food production. Moreover, food prices have steadily inflated since the 1990s, and malnutrition has worsened in much of the Global South (United Nations 2002).

In the Global South, the neoliberal shift to export production has had the greatest impacts in agriculture and fishing. While a majority of Southern nations produce more crop and fishery exports than ever before, fewer of them are food self-sufficient today than in 1985 (Baviera and Bello 2009). In 1996, heads of state endorsed the World Food Summit Plan of Action which established the precedent that "trade is a key element in food security" (Watkins 1996: 248). Less than a decade later, the Food and Agriculture Organization (2003a: 22) warned that the track record of the global food trade in reducing undernourished populations "has been dismal." There is little evidence that such export priorities have helped Global South countries to rise out of poverty or to end hunger (Galbraith 2002; Stiglitz 2002). On the one hand, these nations accumulate high trade imbalances from the exchange of cheaper exports for expensive imports. On the other hand, more than 90 percent of the profits from export agribusinesses accrue to external corporations, leaving little wealth in the producing countries (Weisbrot and Baker 2002). Since 1980, these trends have worsened, as the Global South has been more deeply

integrated into the global agro-industrial food system (McMichael 2005). Indeed, most of the countries that export high levels of agricultural and seafood commodities exhibit high malnutrition rates (Baviera and Bello 2009). Export strategies drain food from Southern countries in which half or more of the households struggle to meet minimal caloric requirements for their families (Shiva 2002).

In reality, the global food system impoverishes the diets of those who can least afford to experience further nutritional deterioration. Food security is not just about total available caloric intake because Southern communities exchange their highest protein resources for less healthy, but more expensive, grains and processed foods. Worldwide, fish comprises 17 percent of the animal protein in the human diet, but fish and shellfish are the most important sources of animal protein in Asian diets. However, Southern countries that export seafoods consume less fish than richer countries. In fact, the richest fifth of the world consumes nearly half of all fish and meat, the poorest fifth only 5 percent. While Asian countries supply the vast majority of internationally-traded seafood products, a handful of rich countries consume 40 percent of the world total supply of fish.[5] To complicate matters, nonfood uses of fish in rich countries (e.g., livestock and pet feeds, aquariums and industrial oils) are greater than the combined human consumption of fish in India, Latin America and Africa. Nearly 30 percent of fishery exports are intended for nonfood uses (FAO 2012b: 16). For example, almost one-fifth of captured wild fish are dried, pressed and ground into fishmeal and oils to feed livestock and aquaculture species (Changing Markets Foundation 2021).

1.2 *The Global Significance of the Asian Fisheries*

Paradoxically, developing countries exhibit the world's highest levels of hunger and malnutrition while they export so much of the food that circulates in the world economy. Fish is the most traded agricultural commodity in the world, with over 50 percent of production marketed internationally. Even though their populations exhibit nutritional deficiencies that could be alleviated through seafood consumption, Asian countries account for 67 percent of exported food fish and 74 percent of nonfood fishery commodities (FAO 2012b). In 2008, twenty Asian countries– twelve of them classified as low-income food-deficient nations– accounted for more than half of the total quantity of fishery exports, the vast majority imported by developed countries.[6] While these exports occurred, Asians suffered from protein shortfalls, iron deficiency

5 Analysis of FAO (2012b).

6 Analysis of fishery exports, FAOSTAT.

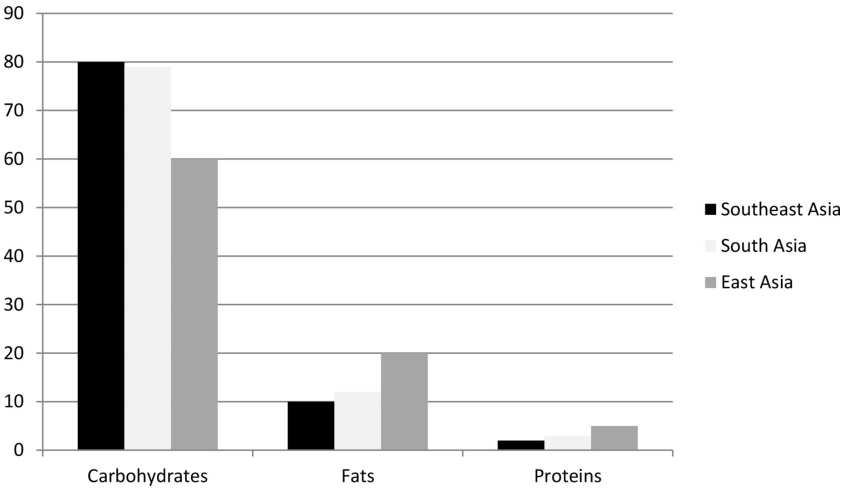

FIGURE 2 Composition of average daily dietary consumption, 2019
SOURCE: ANALYSIS OF FOOD SECURITY STATISTICS, FAOSTAT

anemia, child and maternal nutritional deficiencies to a greater degree than citizens of any other part of the world (FAO 2012b). Despite those food security problems, Asian fisheries and aquaculture facilities prioritized high-value export species over production for local consumption (APFC 2012: 67–130). By 2010, exporting had transformed traditional Asian seafood consumption patterns significantly. As Figure 2 shows, high consumption of fishery products has been displaced by an average daily diet that consists primarily of carbohydrates and fats, with only 10 to 12 percent protein.[7]

We examine the process through which Asian fisheries have been transformed from production for local consumption to follow aggressive export-led agendas, with a particular focus on one country. At the regional level, we provide an overview of the Asian fishery crisis and the linkages between fishery exporting and food insecurity. Through a case study of the Philippines, we pinpoint public fishery policies that exacerbate hunger, nutritional deficiencies and ecological degradation at national and local levels.

1.3 *Hunger and Depeasantization*

We are also interested in a second paradox of world food security. Hunger and malnutrition are concentrated in rural areas of developing countries, most especially Asia, where households and workers produce a majority of

7 Analysis of Food Security Statistics, FAOSTAT.

the world's food (FAO 2012b). In most Asian countries, half to three-quarters of the population are peasants, but their traditional spaces and their livelihoods are increasingly dispossessed by national agendas to target resources for export. Asian commercial capture fishing and aquaculture have been publicly and economically privileged to such an extent that peasant fishers are marginalized and have become the region's poorest, most malnourished food producers (Baviera and Bello 2009). The agro-industrial food regime displaces self-provisioning peasant cultures, converts land and fisheries from production for local consumption to export commodification, and entrenches marketing mechanisms that entangle peasants in debt bondage within export commodity chains (Bailey 1988a, 1988b; Barraclough and Finger-Stick 1996).

Throughout the Global South, small farmers and fishers are displaced through a process of *depeasantization*, i.e., small producers are threatened by national and international pressures to produce for export rather than local markets (Akram-Lodhi and Kay 2009).[8] Through their development priorities, Southern governments reshape local agriculture and fishing into production units that are re-oriented to supply the global supermarket. Under these circumstances, agriculture and fishing are no longer foundational institutions of societies and states because they have been integrated into corporate global supply chains (McMichael 1998: 104). By the early 1980s, nearly one-quarter of all arable lands and about one-third of the fisheries of developing countries were being used to produce food and industrial commodities for the world's richest countries (Magdoff 2013). By 2010, a much greater proportion of Southern lands and fisheries had been "grabbed" by external investors to control those areas for production of export foods, fish and biofuels, displacing or threatening hundreds of thousands of peasant households (OXFAM 2012).

There is another significant way in which depeasantization occurs. National food security is conditioned upon structural incorporation into the global food system, so local households will secure more of their survival necessities from imports, displacing domestic producers (Shiva 2002). "The preference given to the price form disempowers farmers and empowers agribusinesses across the world. In the North, traders and processors purchase commodities through farm contracts at low prices unrelated to production costs. ... For traders, low commodity prices enable commodity dumping in the world market ... forcing

8 European and North American agriculture were depeasantized from the 1940s to the 1980s. By 1994, more than half of all US farm products were cultivated on only 2 percent of the country's agricultural land. Huge corporate agribusinesses supplanted small farmers to the point that 73 percent of farms generated only 9 percent of the country's agricultural outputs in the 1990s (McMichael 1998: 97).

local prices down at the expense of small farmers" (McMichael 2005: 278). The world food regime not only absorbs formal farm and fishery enterprises, but it also captures informal provisioning networks, draining away foods and natural resources that have traditionally been utilized for household consumption (Shiva 2000).

1.4 *The Importance of Gendered Analysis*

The impoverishment and marginalization of rural Asian households have not been eliminated through export-led strategies, and women have borne the brunt of income shortfalls, diminished access to ecological resources, and expanded workloads. According to the Food and Agriculture Organization (2005b: 2, 5), rural Asian women "play a critical role in supporting the three pillars of food security– food production, economic access to available food and nutritional security." Despite these contributions, "a considerable proportion of women's contribution to agricultural labour throughout the region is invisible in macro statistics." To complicate matters, "the development and academic communities have generally paid scant attention to the situation of rural women." In spite of their importance to food security, hunger and malnutrition are disproportionately concentrated among the world's rural females. For these reasons, we focus sharply on rural Asian females, especially fisherwomen. We are concerned about the lack of scholarly attention to gender inequalities in Asian fisheries and to the implications of women's changing work roles in these households. Even though the World Bank (2012) estimates that females account for nearly half the global fishery labor force, "women's work in fisheries, aquaculture, and shellfish harvesting is rarely found in statistics" (Frangoudes and Gerrard 2018: 118). While there have been 21st century international symposia about women in Asian fisheries, that interest has not altered the failure of international organizations to collect and report gender disaggregated data in their annual surveys of the status of fisheries (Harper et al. 2020).[9] According to the Food and Agriculture Organization (2012d: 107–108), "gender analysis in fishing communities focuses mainly on the ... male catching role," minimizing the work of females. For that reason, it is crucial that researchers "look beyond the simplified picture of men as fishers and women as processors to examine the more complex picture."

Women's marginalization and invisibility in public records is also reflected in the failure of scholars to investigate the roles of women, especially when they research Asian fisheries (Pauly 2006; Siar and Kusakabe 2020: 24). Even

9 For example, the 2004 Global Symposium on Gender and Fisheries.

though "gender and fisheries" research emerged in the 1990s as a field of scholarly endeavor (Williams et al. 2004: 5), there is no previous investigation of Asian fisheries "that systematically tackles gender issues or women's participation and integration in fisheries development" (Siason 2001: 76).[10] By reconceptualizing the work roles of fisherwomen, we seek to address this gap in the literature and to overcome the sexist stereotypes that handicap public policy formation about fishing communities. During our ethnographic research, we asked male fishery officials and fishermen to describe women's work roles in fishing. Only 39 percent of our male interviewees acknowledged female work roles, but we routinely photographed female labors that these males could witness as easily as we did. For example, only 22 percent of these men reported that wives mended nets, an activity that was highly visible to us throughout fishing communities.[11] In contrast to male stereotypes, women are visibly involved in work that is credited to male fishers, and many older wives indicate they always have been. Women fish in boats alone, and they manage the harvesting and repairs of large stationary net systems, as our photographs will show. Furthermore, "there has been a research gap about the changing contours and experiencing of gendered lives by men and women in fishing communities in relation to economic restructuring" (Turgo 2015: 372). Daniel Pauly (2006: 16) indicates that the roles of women in small-scale fisheries are understudied because of the narrow range of "traditional" questions that have guided scholars. He advises that what is especially needed is analysis of how women in fishing households "literally subsidize male fishers" and make their continued low-paying fishing economically feasible. We embedded the concerns of Turgo and Pauly in our field research, and we address shifting gender roles in our theoretical formulations.

2 Methods of Inquiry and Areas of Study

While many scholars apply a narrow caloric accounting to their assessments of hunger, we will utilize throughout our analysis the broader, more complex distinctions. *Undernutrition* refers to lack of sufficient calories. *Malnutrition* or *nutritional deficiency* refer to failure to acquire nutrients that are essential to healthy growth, energy for physical activity and bodily survival (WHO 1992, 2017, 2021). We will also adhere to the United Nations definition of *food security*

10 A rare exception to the tendency of western academics and feminists to ignore fisherwomen in the contemporary era is a 2012 special issue of *Signs* (vol. 37, issue 3).

11 Analysis of MSU Naawan Foundation (2006: 201).

as being that context within a country "when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (World Food Summit 1996: Point 3.6). To aid in our comparative analyses, we will employ annual classification of countries by the *Global Hunger Index* (Concern Worldwide 2010–2018), as well as the iterations of *low-income food-deficient* countries by the Food and Agriculture Organization.[12]

2.1 *Target Study Areas*

We have woven six vantage points into our analysis: global, national, regional, small community, household, and women. At the macrostructural level, our first target area consists of those sixteen fisheries of East, South and Southeast Asia that produce more than two-thirds of the world's seafoods and account for more than one-third of world fishery exports (see Table 1). Except for North Korea, they rank in the world's top fifty fishery producers and exporters. Because a majority of Asian countries do not export fish at more than trivial levels (FAO 2012b), we focus on the fifteen countries of East, South and Southeast Asia, plus the Taiwan province of China.[13] Fifteen of these Asian fisheries rank among the top forty producers of captured fish while fifteen rank among the top thirty aquaculture producers (see Table 1). Thirteen of these countries rank among the top fifty fishery exporters. More than two-thirds of their fishery exports go to the United States, Canada, Europe and other developed countries, with only about one-fifth traded to Asian countries.[14] Despite their high fishery exporting and dramatic expansion of agricultural outputs over the last two decades, thirteen of these fisheries exhibited alarming, serious or moderate Global Hunger Indexes between 2010 and 2018 (Concern Worldwide 2010–2018).[15] In 2010, eight of them were classified by the Food and Agriculture

12 For explanation of how the LIFDC list is determined, see www.fao.org/countryprofiles/lifdc/en/ (accessed 2 Oct. 2021).

13 Aggregation and analysis of export data, UN COMTRADE database. We have excluded seven countries that are situated in these Asian subregions. While Lao DRP and Nepal produce fish domestically, they neither export nor import more than trivial levels of seafoods. Bhutan, Brunei and Timor-Leste produce, export and import little fish. Singapore produces no fish, even though it re-exports a small amount of its fishery imports. Despite its high fishery exporting, we were forced to exclude Maldives because data for this little island country are too inconsistently reported by FAO and UNCOMTRADE.

14 Analysis of FAO (2012e).

15 Between 1998–2010, food crop and fish production increased significantly in all these countries, except Japan, North Korea and South Korea (World Bank Development Indicators online).

Organization (2011a) as low-income food-deficit countries that were relying heavily on food imports and exhibiting food shortfalls.

We report data and analysis separately for mainland China and Taiwan, Province of China, because of the sharp differences in the Human Development Indexes for them and because these two parts of China exhibit very different patterns of food security. If we merged mainland and Taiwan data, the food security trends would be distorted, resulting in a highly inaccurate representation of mainland China. Afghanistan, Bhutan, Brunei, Mongolia, Nepal, and Timor-Leste were excluded because they produce, import, and export very little fish. Lao DRP was excluded because it exports very little of its domestic production. Singapore and China-Hong Kong were excluded because they are fishery *re-exporters*. That is, they produce little fish domestically, import great quantities, then re-export higher levels of fish than they produce nationally. Even though Maldives exports a high proportion of its fish and is dependent on food imports, we were forced to exclude that tiny island country because the Food and Agriculture Organization, World Health Organization, Asian Development Bank and World Bank report limited or inconsistent data for it.

Our second target study area is a highly-indebted country that exports three-quarters of its fishery products even though it is food-deficient. In an attempt to repay its accumulated external debt, the Philippines opened access to its ecological resources to foreign investors and vastly broadened its food exporting. In 1994, the World Bank congratulated the Philippines for being one of the "most deregulated" economies in Asia, predicting that the country was right on track for full economic recovery by 2000 (*Asia Money Magazine*, March 1996 Supplement). By the early 21st century, however, the Philippines had declined from the most dynamic economy in Asia during the 1950s to a nation facing fiscal crisis and economic stagnation (Lim and Montes 2002; Escobar 2004). About half the population lives in the thousands of fishing communities that line the coasts, so seafoods traditionally provided two-thirds of all animal protein in household diets, especially among the poor (Goldoftas 2006: 85). Since 1980, Philippine coastal areas and inland rivers have been targeted for expansion of commercial capture fishing to meet national export goals. In addition, the country developed the world's largest area of river-based fishponds situated in deforested mangroves (World Bank Philippines 2003). By 2010, the Philippines was ranked as a food-deficient country with serious nutritional deficiencies among 40 percent of women and children (FAO 2014b), and its croplands, inland waterways and coastal areas had suffered three decades of severe ecological degradation due to exploitation of natural resources for export (Pineda-Ofreneo 1991; Broad and Cavanaugh 1993; World Bank Philippines 2003).

Our third research target area is a Philippine fishery that has been articulated with the global food system. A Philippine coastal region is an ideal area to explore the impacts of integration into the global agro-industrial food regime, for these are ecozones in which farming, agribusinesses, capture fishing and aquaculture rival for control over natural resources. In order to investigate what happens to local peasant communities, ecosystems and households when a country transforms itself into a food extractive enclave, we focus on a Philippine region that has been nationally targeted for intensive reorientiation of its natural resources and productive systems. Our study region, Panguil Bay, is located in northwestern Mindanao (see Figure 3) where the shift to export

FIGURE 3 Philippines, showing the island of Mindanao. The star indicates the location of Panguil Bay

agriculture, fishing and aquaculture began in the 1980s. We selected this seafood exporting area because it has been repeatedly targeted by national development plans for intense exploitation of its natural resources and for deeper integration into the global food system. The bay is 29 kilometers wide with a coastline that extends 112 kilometers, and 29 major rivers pour into it. Because of these characteristics, Panguil Bay was in the past a breeding ground for many species of finfish, shellfish, crustaceans and mollusks. Considered the richest shallow water fishing ground in Mindanao, the hydrological characteristics and the confined waters of Panguil Bay make it ideal for capture fishing, aquaculture and seaweed farming (JEP-ATRE 2004).

Between 1982 and 1991, fishponds expanded 18 percent annually, tripling the area utilized by export aquaculture in just a few years (Naawan School of Fisheries 1991). Within a decade, small-scale, family-owned, polycultural aquaculture aimed at domestic markets was displaced by export-oriented fishponds (Primavera 1995). In the same time period, commercial capture fishing expanded finfish exports significantly (Philippine Annual Fisheries Profile, 1983–1992). In addition to fishing and aquaculture, Panguil Bay is ringed by farms, industries, and beach resorts that pollute the coastal waters (MSU Naawan Foundation 2006). A majority of the households along Panguil Bay have been marginalized by the export agendas, and fishers are increasingly at risk of government-stimulated depeasantization. The vast majority of these peasant fishers (referred to as *artisanal fishers* by many scholars) work in small wooden boats or use small nets to average daily incomes of less than $1, situating these families below the World Bank demarcation for absolute poverty. Once one of the richest fishing grounds in the Philippines, Panguil Bay has been pushed to the point of severe crisis over the last thirty years, as its ecological resources and its peasants were integrated into global commodity chains. Because this fishery was quickly degraded, it has undergone more than a decade of failed ecological rehabilitation initiatives (JEP-ATRE 2004; MSU Naawan Foundation 2006), only to be targeted for more intensified resource extraction since 2000 (Republic of Philippines 2000).

2.2 *Statistical and Archival Sources*

We triangulated global, national, regional and local community vantage points through analysis of electronic statistical databases and archival documents. For global and regional trends, we relied upon the electronic archives of the Food and Agriculture Organization, the Asian Development Bank, and the World Bank. To analyze micronutrient deficiencies, we drew upon the World Health Organization databases. Trade databases at the ASEAN Food Security Information System, the Food and Agriculture Organization and the

International Trade Centre were useful in our analyses of Asian and Philippine export patterns, as well as dependence on imported foods. Unlike most Southern nations, the Philippines maintains public websites through which researchers can access a wealth of statistical data and archived policy and legal information. We analyzed agricultural, fishery, import and export trends from databases available at several government websites, especially the Bureau of Fisheries and Aquatic Resources, the Quickstat Census Database, and the Rural Sector Statistical Information System. The country's Food and Nutrition Research Institute provides (a) national household survey data that can be used to assess the geography of hunger and nutritional deficiencies and (b) policy information that helped us to link public dietary standards and policies to corporate goals and to food exporting agendas.

In addition to these statistical databases, we explored nationally-funded electronic archives of Philippine local governments to secure information about industries, agricultural outputs, fishing and aquaculture activities, and socioeconomic conditions. Websites of the Philippine Department of Agriculture, the Philippine Information Agency, and the US Foreign Agricultural Service posted archives of press releases and program descriptions that helped us to gain insight into Philippine agricultural policies and subsidies. The news archive of the Department of Agriculture provided information about subsidized programs, export targets and recruitment of foreign investors. News archives of the International Rice Research Institute, the Philippine Rice Research Institute, and the Seaweed Industry of the Philippines gave us insight into public policies about these two crucial commodities and about public controversy over genetically-modified rice seeds. In addition, we consulted the websites of government-sponsored blogs to identify problems that local fishers challenge the national government to rectify, e.g., the intrusion of foreign commercial fishing vessels into the waters of Panguil Bay.

To supplement public sources, we gleaned the electronic archives of Philippine newspapers and periodicals for information about government development agendas in the fishery and aquaculture sectors, about the introduction of new agricultural and aquaculture technologies and species, about the opposition of fisherfolk associations to government policies, and about the state of rice availability in the country. In several instances, we substantiated information from fisher interviews through websites of local and regional newspapers. Finally, we searched the electronic archives of associations of fishers, peasants and small farmers to pinpoint the problems these groups experienced from Philippine land reform approaches and from the country's commitment to export aquaculture and cash crops. On the ground in the Philippines, we explored every possible resource base where information about Philippine fishers has

been retained in paper form since the 1970s. We acquired unpublished reports and internal memoranda from local government entities, regional offices of the Bureau of Fishing and Aquatic Resources, community health centers, and city fishing offices. We were provided access to published and unpublished reports by NGOs, local universities and Philippine scholars.

2.3 *Methodological Flaws in Databases*

Because of the methodological flaws in public data sources, we became increasingly aware that we offer conservative underestimations of the actual extent of hunger in the Asian fisheries. Most researchers rely uncritically upon data collected from FAO Food Balance Sheets, but "indirect proxies such as those based on the balance of a country's known or estimated production, imports and exports, can be seriously misleading" (Godfray et al. 2010: 2776). Indeed, they are flawed in four ways. First, the Sheets are not consistent in reporting categories, especially for comparative purposes over a period of years. Only recently have the Food Balance Sheets begun to estimate nonfood utilization, but limiting those estimates to feeds and seed reservations at production sites. These Sheets do not take into account the conversions of fishery commodities into nonfoods after they leave production sites. To overcome this gap, we have sought out the latest national and scholarly research about nonfoods. Second, the Sheets, in recent years but not over time consistently, estimate wastage losses that occur at production sites, but not after fishery commodities are sold. For that reason, we have drawn upon the latest research about food wastage to offer better estimates in our tables. Third, the Balance Sheets often show lower fishery exports than actually occur. For that reason, we report and analyze export data drawn from UNCOMTRADE. Fourth, there is a three to four year time lag, so the current year statistics are typically based on data reported three years prior to the publication date. We took care to make sure that we compared data that was collected in the same year, but many scholars report these data as though they occurred in the year of publication. As a result of these FAO reporting problems, most researchers arrive at overly optimistic estimates about food security.[16] We will remind readers of these data source weaknesses when we discuss our tables about nutritional shortfalls.

2.4 *Ethnographic Field Research*

While we investigate the fishery crisis and food insecurity at global, national, and regional levels of analysis, we also explore what happens to local peasant

16 See, for example, the overestimation of China's food security in Chen and Duncan (2008: 188) because the analysts ignored nonfoods and wastage.

communities, rural households and women when their region is integrated into the global food system. To accomplish this significant component of our investigation, we conducted ethnographic field research in local Philippine communities. Our field research targeted local government officials, NGO and nonprofit cooperative staff, and peasant fishing households. The frequent hospitality and insights of NGO staff helped our complex research process to run smoothly and guided us toward the kinds of questions we should address to the fishing households we interviewed. In addition, some of these organizations helped us to initiate contact with fishing households, fishpond operators and seaweed growers. Because of the hospitality of local people, we were often invited to attend community activities where we benefitted from the honesty and the openness of grassroots participants. Initially, we interacted with fishermen and fisherwomen in informal focus groups. We often adapted our group inquiries to the exigencies of real-life circumstances. In one community, for instance, we initiated a group discussion after a female community meeting. Though women were the invited participants, male onlookers offered unsolicited, but very useful, extensions of the female responses. In another community, an impromptu group discussion occurred with women who thatch roof shingles from palm foliage. While they waited to be paid by the buyer, they offered insights about the causes of ecological degradation in Panguil Bay and about the difficulties of survival in fishing households. In addition to meetings of community organizations and women's groups, pedicab drivers proved to be excellent sources of information about economic conditions and about governmental politics.[17]

We conducted in-depth interviews with fisher husbands and wives in their own dialect. Husbands and wives were first interviewed together, followed by separate in-depth interviews of wives. While most were interviewed in their homes, we observed many at work sites outside their households. These interviews were designed to secure details about household living conditions and livelihoods, social and ecological impacts of seafood exporting, survival strategies in the face of declining catches, and gender inequalities. We also asked interviewees to evaluate how their fish catches, their livelihood strategies, and gendered work roles had changed over time. We quickly learned that many respondents could not estimate their daily or weekly incomes because they were enmeshed in debt bondage systems with fish traders from whom they rarely received cash. Since we needed to devise a strategy to make meaningful estimations, we asked them how much rice or other food they obtained weekly

17 A pedicab is a bicycle which has attached seats for passengers.

and what other expenses they covered through their fish exchanges in local markets. Subsequently, we converted those estimates into local prices. Later, we realized that this accidental rich household data about consumption would permit us to compare Panguil Bay fishers with national and Asian regional statistics about food shortfalls and nutritional deficiencies.

Because there were many opportunities to observe the daily lives of these peasant households, we developed an extensive photographic journal of the Panguil Bay fishery. We captured as many aspects as possible of the economic activities in which fishing households engage. We made a special effort to photograph women's fishing work because these activities are typically rendered invisible by researchers and policy-makers. The photographs proved to be an invaluable source of empirical information about ecological impacts of aquaculture, about survival strategies, and about the ways in which women are undertaking work that is traditionally credited to men. Our living arrangements with local families provided opportunities to experience first-hand the degree of difficulties involved in aspects of their daily lives. There are no viable health care facilities in their communities, and most of them die without ever seeing a doctor. Sickening high mold levels permeate their surroundings. Foul fishpond and garbage odors corrupt the breathing air. The water they collect from public spigots is impure, few of them have access to electricity, and many of their communities lack sanitary toilets. They bathe and do laundry in canals and streams where they are frequently exposed to chemical pollutants and deadly parasites. Every day, women ignore unhealed skin rashes to gather oysters and small fish from coastal waters polluted by fishpond discharges and industrial waste. We saw firsthand how pregnant mothers dangerously deprive themselves of food so their children do not go totally hungry. We did not have the physical stamina to endure the twelve hours with knees folded under, like the women who thatch palm fronds to earn extra household income. After a day of such hardships, thousands of rice fleas fill their limited sleeping hours.

One is struck with awe by the resilience of families who live a Spartan existence inside a tiny stilted cabin that stands precariously over tide waters or beside a mud-banked fishpond that periodically breaks and destroys everything around it. We witnessed one of the "dreaded floods" that have become routine over the last thirty years. In a typical pattern, heavy rains in the adjacent mountains overflowed Panguil Bay communities. However, the flood control device had been designed to protect fishponds, not fishing villages or rice fields. The rushing flood transformed irrigation canals into moving walls of water that engulfed roads, uprooted wooden bridges, contaminated springs and public water sources, damaged fisher homes and carried dangerous waste and snakes into their living spaces. We accompanied wives who rushed in small canoes

to carry to dry ground the palm fronds they had gathered to produce the roof shingles that would earn them critical household income.

FIGURE 4 Philippine fishing villages then and now. Despite government claims that Philippine fishing villages have been "modernized," living conditions in most communities are much the same as they were at the turn of the 20th century. The top photograph was taken by the US Army as soldiers moved through the Panguil Bay area during World War II. In our bottom recent photograph, the only noticeable change is that the contemporary peasant household now "squats" illegally next to a fishpond whose operator leases what was once a public commons

To conceal the identity of our interviewees, we have employed pseudonyms and removed specific descriptors that would make them easily recognizable in their own communities. Eliminating names is not enough to shield the identities of our interviewees because their communities are too small. It is necessary to obscure community names because a description of the particular characteristics of a fisher family, NGO staffer, or government employee would make it easy for local officials or neighbors to recognize them. As an added security measure, we have not utilized quotes or work histories from any of the individuals who are depicted in photographs.

2.5 *Gleaning Philippine Scholarship*

For three decades, Philippine social scientists and ecologists have been raising alarms about the ecological dangers of commercial capture fishing and aquaculture, about the ways in which these activities threaten peasant communities and livelihoods, and about the negative impacts of fishery exports on Philippine food security. Because their investigations have received little attention in the United States or Europe, we seek to draw attention to their ideas. On the one hand, such studies made it possible for us to compare our findings about Panguil Bay with other Philippine fishing communities. On the other hand, these earlier investigations permitted us to estimate the degree to which the survival threats to fishing households have worsened over time. We also drew heavily upon accumulated national and university research about time allocation within households, as the Philippines is one of a few Southern countries with expertise in this area since the 1970s (e.g., Ardales 1981; Quezon-King and Evenson 1983).

Since most western feminists are uninformed about the long tradition of Philippine feminist scholarship and activism, we tapped into this accumulated reservoir of knowledge, especially those analyses that have focused on the work roles of rural women (e.g., Pineda-Ofreneo 1985). Since the early 1980s, several of these feminists have challenged the western perception that the Philippines is more gender egalitarian than most Asian countries (e.g., Israel-Sobritchea 1992). Moreover, they have questioned the claims that agricultural and fishing wives exist in their own separate housebound sphere from which they rarely engage in income-earning activities (e.g., Illo 1995). Several earlier analyses of fishing households pointed to the frequency with which females engage in labors that are culturally credited to males and to the tendency for that female work to be economically devalued and rendered invisible (e.g., Castro 1986; Illo and Polo 1990). In addition, many of them depict the Philippine household as a conflictual, hierarchical unit in which "men unambiguously exercise direct power over women" (Eviota 1992: 113).

Some of them focus on the ways in which the household budgeting roles of wives make them inequitably responsible for household survival needs and position them to be the targets for domestic violence from husbands (e.g., Mabunay 1995). Their earlier work provided clues about intra-household inequalities we should explore and presented us a backdrop against which to pinpoint questions we should direct to fisherwomen. While their insights and ethnographic details were useful, we offer a global context and a feminist conceptual approach that is our own.

3 What Do We Promise Readers Conceptually?

The 21st century crisis in the world food system lies in the sixteen Asian fisheries where a majority of the world's fishers and food producers reside. What we promise to readers is a factual and conceptual examination of that unfolding food crisis and of the fragile livelihoods, food insecurity, conflicts over land, and degrading ecosystems that face the people who produce most of the world's food while going hungry themselves. We do not promise readers a deeper foray into tensions between our research questions and ongoing debates in peasant studies, development theories, dependency theory, world-systems analysis, or the question of whether the future world economy will be Sino-centered. Drawing upon ideas from previous studies of ecological unequal exchange, we introduce the concept of *nutritional unequal exchange* to explore how the Asian fisheries exacerbate hunger through trade within the world food system. Paralleling earlier ecological analyses of the damages caused by extraction of natural resources from developing countries, we offer the notion of the Asian fisheries as *food extractive enclaves*. From world-systems analysis, we derive our approach to fishery commodity chains, and we invent our notion of *commodity chained peasants*. From Mao Tse-Tung (1926) and Wallerstein (1983), we drew ideas to guide us in our exploration of the *semiproletarianized households* that are typical of 21st century Asian peasant fishing and farming communities. While we are well aware that "the household" is not an explanatory device that is comfortable to most western feminists, we seek to *decenter* theory to reflect the reality that the lives of most rural Asian women are legally and culturally circumscribed by their household roles. Influenced by German Marxist feminists Maria Mies (1986) and Veronica von Werlhof (1983, 1985), we have developed our own radical feminism from the vantage point of Asian women and their households, with *paid nonwaged* labors at the heart of their economic livelihoods. To parallel the "portfolio of diverse investments" held by transnational elites, we introduce the concept *portfolio of diverse labors*, using

livelihood histories to demonstrate how fisherwives merge nonwaged and waged labors that have market value with their unpaid reproductive work.

In the development of these concepts, we worked hard to avoid western conceptual arguments that might cause us to fall into the trap of essentializing Asian peasants or of thinking of Asian food producers with the western blinders that shape the expression "the peasantry." Thus, readers will find us exploring *indigenous* peasants who are central to food production and to conflict over land grabbing because they occupy a high proportion of the richest ecological areas of the Asian fisheries. In order to investigate Asian hunger from the vantage point of malnourished Asians, especially the women and children, we call upon readers to reach beyond familiar boxes of preconceived western conceptual thinking. We avoid the kind of "categorical" thinking in which Asian women and peasants are essentialized in ways that are intended to make them fit preconceived western theoretical maxims. Furthermore, we shape our research around the people who are usually silenced by fishery studies—women and their households. For that reason, we grounded our research questions and our search for explanations in the crises, inequalities and household histories experienced by the people whose pursuit of livelihood and of food security emerged in our ethnographic research. We quickly realized that there are no neat western theoretical boxes to help us explain the multiple layers of work and hunger that we captured in our field interviews and our photographic journal.

The concept in our book that may trouble readers most is *nonwaged labors* that have market value and are integrated into global commodity chains. The notion of nonwaged labor is appropriate for Global South contexts in which people, most especially women, earn their livelihoods through mechanisms other than waged labor (ILO 2007), and there is certainly very little "waged" labor in Asian fishing and agriculture. The 21st century is clinging tenaciously to the exploitative mechanisms of debt bondage and informal sector while at the same time creating new forms of contract farming/fishing and sharecropping. It is neither sufficient nor accurate to dismiss paid nonwaged labors as though they are no more than "historical backward anomalies or vestiges" that capitalism has failed to destroy in developing countries (Marx 1849; Peet 1980; Tairako 2019). On the one hand, the numbers of nonwaged laborers are expanding in the 21st century (Breman 1996; ILO 2007), as capitalists integrate them into global commodity chains because they provide greater profits from low-paid workers (Dunaway 2013).[18] On the other hand, why would we go in

18 Since the early 2000s, the International Labour Organization (2007) and the United Nations (2003) have repeatedly published country and regional studies that establish

search of the western-biased notion of "waged" labor in Asia where there are concentrated a majority of the world's people in debt bondage? (Kara 2012). In reality, 21st century Asian export agriculture and fishing are dependent upon the many layers through which capitalists embed peasants in nonwaged labor mechanisms and bonded indebtedness. While we did not coin the notion of paid nonwaged labors, we have embraced it because we can easily ground it conceptually in our ethnographic research among people who will *never* earn a "wage" in their lifetimes. Indeed, our photographs exhibit without words that women engage in many nonwaged labors that have economic value in local and global markets. From our goal to decenter theory, we are convinced that "waged labor" is a privilege primarily of the laborers in a few rich countries, but increasingly less so even there, as precarity worsens in the 21st century (Azmanova 2020). Consequently, we consider "waged labor" to be one of the most Eurocentric-biased notions that is worshipped in western scholarship.

We inform readers factually that peasant farmers and fishers are engaging in structured resistance, but we will frustrate some by not exploring how that resistance might become a 21st century revolution for change or part of the food sovereignty movement. While important, such conceptual explorations are beyond the scope of our book. We do not argue that peasant resistance strategies are effective or are the "role model" for any future revolution. We simply intend to state factually that resistance is a mechanism of *peasant persistence*, that through public resistance they prevent their governments and capitalist elites from destroying them completely. There are great numbers of Asian peasants who do attract international allies and who do scare powerful politicians when they pour into the streets. In reaction to farmer protests while we were writing this book, the neoliberal Indian government changed direction on its new farm laws and on a Supreme Court ruling that would remove a million people from public lands. Since a deeper foray into peasant resistance is beyond the scope of our research, we decided to approach this subject by making readers knowledgeable of major land grabs and human rights violations and by identifying relevant sources and NGOs in footnotes.

Finally, we do not examine Asian peasants as *subsistence* producers, nor do we employ the word in our text. The argument that a peasant is strictly a poor subsistence producer who operates outside all market ties (e.g., Robinson 1979: 47; Zhang and Donaldson 2010) is not appropriate for these 21st century Asian fisheries, if it ever was historically accurate. Our ethnographic research

"nonwaged labor" as the predominant form of livelihoods among Global South workers. We cite these cutting-edge studies.

informed us that Asian peasants are sucked into global commodity chains through several exploitative mechanisms that prevent them from being subsistent. Landlessness, debt bondage, contract fishing/farming and sharecropping trap them in export commodity chains whether or not they would prefer to be subsistent. The fishers we encountered in our field research recognize that a singular focus on subsistence provisioning has been out of their reach for a long time. Government development agendas, powerful fishery elites and export-oriented landlords will not allow them ecological spaces to be outside the bounds of production for global markets (cf. McMichael 2008; Shiva 2016), a reality that becomes clear in our investigation of the impacts of national and international land grabbing on Asian peasants.

4 Organization of the Book

The central question of our study is: *Why are the Asian peasants who produce and export so much of the world's food the hungriest people in the world?* We have organized our chapters to investigate that question at both macrostructural and microstructural levels. Chapters 1, 7 and 8 provide a regional assessment of food security in the Asian fisheries. We are well aware that we need to put human faces on statistical trends, so readers will not disengage from this crisis. As an exemplar of what has happened throughout the Asian fisheries, Chapters 2 through 6 offer an ethnographic case study of the transformation of the Philippines into an *extractive food enclave*.

Chapter 1 provides an overview of Asian food security, with a focus on the significance of fisheries. After an overview of the extent of Asian hunger and malnutrition, we examine six threats to regional food security: fishery exporting, redirection of seafoods into nonfood exports, growing dependence on imports, depeasantization, ecological degradation and intra-national inequalities in food access and food losses due to waste. The worst nutritional shortfalls in these fisheries are high iron and high protein foods, largely because domestic fish consumption has dropped as exporting has risen. We introduce the notion of *nutritional unequal exchange* to explore how these fisheries "trade down" internationally, substituting high fat/sugar imports for their more nutritious exports. Indeed, the world food system is nutritionally bifurcated, grounded in insufficient resources and underconsumption for the hungriest producing zones and privileged overconsumption in the least hungry, richer zones that devour the most nutritiously valuable foods. The fisheries with the worst hunger indices also engage in nutritional unequal exchange in order to export high iron/protein commodities to regions of the world that experience

far less hunger. Those less-hungry importers ship back commodities that offer little relief from food and nutritional shortfalls.

By offering a case study of a nation that is both a major fishery exporter and a food-deficient country, Chapter 2 explores the linkages between external debt and the integration of Asian resources into the global food trading system. The urgent need to acquire foreign exchange to repay spiraling debts became the national justification for privatization and exploitation of public commons, especially coastal waterways and mangroves. By targeting its natural resources and peasant laborers for export exploitation, the Philippine government systematically integrated its agriculture and fisheries into the global food system. Initially, we examine the role of Philippine elites in neoliberal restructuring. Subsequently, we investigate how state promotion of export strategies in agriculture, capture fishing and aquaculture shifted the country away from food self-sufficiency. In the final section, we describe the ecological impacts of these export approaches.

By exploring threats to Philippine food security in Chapter 3, we pinpoint three development policies that threaten Asian food security: (1) state privileging of food exporting over domestic consumption, (2) increasing dependence on imports, and (3) transformation of human dietary staples into nonfoods. While millions of tons of foods flow out of the country, a large segment of the Philippine population is unable to afford seafoods, vegetables, nuts, fruits and cooking oils. At least one-third of the Philippine population is chronically malnourished, and deficiencies are spread through the ranks of most of the middle class and a majority of women.

Chapter 4 investigates what has happened to the communities and the peasants of an Asian fishery in the wake of debt-driven development strategies. Since the early 1980s, Philippine policymakers have advocated an "agribusiness approach to countryside development" that prioritizes larger enterprises, fewer independent peasants and production of a limited array of export crops and fishery products (Republic of Philippines 2000). As a result, the ecological resources and peasant laborers of fisheries have been integrated into the global food system. We examine the commodity chains for shellfish, finfish and live reef species, through which regional brokers and commission merchants orchestrate the transfer of exports to national and global wholesalers and processors. Regional re-orientation of productive assets to prioritize exports has had four significant impacts on peasant communities: depeasantization, ecological degradation, loss of livelihood, and food insecurity.

Chapter 5 analyzes the human and community impacts that have followed the transformation of a food self-sufficient region into a *food extractive enclave*. We examine how seafood exporters keep global consumer prices fictitiously

cheap through two interconnected processes. On the one hand, seafood commodity chains structure mechanisms through which exporters derive hidden labor subsidies from peasant households. On the other hand, exporters keep prices low and profits higher by externalizing costs of production to fisher households through livelihood threats, depeasantization, low remuneration, debt bondage, degraded ecosystems and threats to human survival. As a result of hidden household subsidies and externalization of costs, the United Nations Human Development Indexes for our target fishery are among the worst in the world. Even though their communities are exporting vast amounts of farm produce and seafoods, these peasants are 1.3 times more likely to fall below the food threshold than other rural households. Moreover, fishery restructuring has led to the alteration and intensification of women's work in ways that threaten household survival and food security.

It is our goal in Chapter 6 to examine the interplay between global and local by measuring the impacts of export policies on peasant household survival strategies and on women's work. To pinpoint local impacts, we draw upon our ethnographic field research to investigate the gendered inequalities embedded within peasant household survival mechanisms. To parallel the "diverse portfolio of diverse investments" held by capitalist elites, we introduce the concept *portfolio of diverse labors*, using livelihood histories and photographs to demonstrate how fisherwives merge nonwaged and waged labors that have market value with their unpaid provisioning and reproductive work. Next we explore four gendered household survival strategies: management of scarce labor time, arrangement of household credit, restructuring household boundaries, and inequitable pooling and allocation of household resources. Peasant wives contribute a majority of unpaid household and provisioning labors, but they also account for a higher proportion of income-generating work time. Our interviews make it clear that women's work is central to household provisioning, often generates greater income than that earned by males, and provides visible and hidden inputs into the exports that enter global seafood commodity chains. Despite significant contributions, females receive an inequitable share of the household pool, as males receive more resources than they generate.

The crises facing food security and peasant food producers in the Philippines derive from the unfolding structural trends of the larger region and of the capitalist world-system. In order to emphasize that point, we return in the final two chapters to the regional examination that we will initiate in the first chapter. Even though they account for more than three-quarters of the world's farm operators and fishers, the peasant producers of the sixteen Asian fisheries are largely invisible in the global politics over world food security. In Chapter 7,

we investigate climate change and land grabbing as threats to Asian food security and peasant persistence, and we address the question of whether there is likely to be the transition to large farms in Asia that has occurred historically in richer countries. Chapter 8 provides an assessment of Asian food security in the 21st century, followed by an examination of the centrality of peasant farmers and fishers to food production. We explore urbanization and debt bondage as threats to the persistence of Asian peasants, concluding with the question of whether Asian peasants are likely to persist into the 21st century.

CHAPTER 1

The Asian Fishery Crisis, Nutritional Unequal Exchange and Food Insecurity

Abstract

We provide an overview of Asian food security, with a focus on the significance of fisheries. After an overview of the extent of Asian hunger and malnutrition, we examine six threats to regional food security: fishery exporting, redirection of seafoods into nonfood exports, growing dependence on imports, depeasantization, ecological degradation, intra-national inequalities in food access and food losses due to waste. The worst nutritional shortfalls in these fisheries are high iron and high protein foods, largely because domestic fish consumption has dropped as exporting has risen. We introduce the notion of *nutritional unequal exchange* to explore how these fisheries "trade down" internationally, substituting high fat/sugar imports for their more nutritious exports. Indeed, the world food system is nutritionally bifurcated, grounded in insufficient resources and underconsumption for the hungriest producing zones and privileged overconsumption in the least hungry, richer zones that devour the most nutritiously valuable foods. The fisheries with the worst hunger indices also engage in nutritional unequal exchange in order to export high iron/protein commodities to regions of the world that experience far less hunger. Those less-hungry importers ship back commodities that offer little relief from food and nutritional shortfalls.

> In a world of unparalleled rural production and productivity ... the number of those living in varying degrees of food insecurity and chronic hunger ... is historically unprecedented.
>
> (HAROON AKRAM-LODHI AND CRISTOBAL KAY 2010: 41)

• • •

> Economic growth is ... not sufficient to accelerate reduction of hunger and malnutrition.
>
> (Food and Agriculture Organization 2012b: 4)

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A majority of the world's hungry and malnourished people are concentrated in our target areas of study, i.e., those territories of East, South and Southeast Asia that produce more than three-quarters of the world's fish and export nearly one-third of globally traded fishery commodities (see Table 1). Between 2000 and 2010, regional calories per capita fell below the average for all the world's developing countries. Even though these Asians spent more than half their household budgets on food (FAO 2014a), one of every eight people in this region "goes to bed hungry" (ADB 2013: xv). Consequently, East, South and Southeast Asia are populated by two-thirds of the world's hungry people (see Figure 1). How could this be the case? Between 2000 and 2010, food production rates expanded in twelve of these Asia fisheries, but crops and fishery *commodities for export* absorbed much of that increase.[1]

Consequently, there is a counterintuitive food security paradox in East, South and Southeast Asia. Regional food production rose from 0.8 tons per capita in 1990 to 1.1 tons per capita in 2009. This annual 1.7 percentage growth rate was greater than that of any other region of the world. As a result, this region's share in world food output increased from 41 percent in 1995 to 46 percent in 2009 (ADB 2013). In 2011, these Asian fisheries accounted for a majority of the world's wild outputs and more than two-thirds of aquaculture production (FAO 2012e). As the Asian Development Bank (2013: xv) observes, food security requires "much more than raising food production." Despite rising food and fishery outputs and exports, the number of undernourished people increased between 1995 and 2005 (FAO 2010: 22), and high levels of serious nutritional deficiencies continued (Ramachandran 2007; FAO 2012b). In 2011, nine of the world's low-income food-deficient countries were situated in South and Southeast Asia (FAO 2011a), accounting for 29 percent of world population. Even though households are dependent on fish for one-third to three-quarters of their animal protein, fishery products are so prioritized for export that they are too expensive for consumption by the poor and a sizeable segment of the middle classes (FAO 2012b). While distant consumers have enjoyed declining prices that derived from Asia's expanding supply of finfish (e.g., tilapia), shellfish (e.g., shrimp), crustaceans (e.g., crabs) and mollusks (e.g., oysters), seafoods became scarcer locally, and domestic prices inflated within Asian low-income food-deficient countries, like Bangladesh and the Philippines (FAO 2019a). Even countries that appear to be food self-sufficient mask underlying food shortfalls. For example, India is celebrated as being *food self-sufficient* nationally, but a majority of its citizens acquire less than 90 percent

1 Analysis of crop and fishery outputs in FAO (2017a, 2018). Throughout this chapter, monetary values are expressed in $US.

of recommended daily caloric intake, fish consumption has declined sharply over the last decade, and protein and iron deficiencies are widespread (Reddy and Mishra 2009).

1 Trends in Asian Fishery Production and Nutritional Shortfalls

The most alarming levels of hunger occur in Bangladesh, Cambodia, India, and Pakistan. Bangladesh has one of the highest undernutrition rates in the world, with 40 percent of its population and 50 percent of its women absorbing fewer calories than are needed for healthy survival (see Table 2). In terms of economic productivity of adult citizens, malnutrition costs Bangladesh $1 billion annually (Toufique 2015). Nearly half its population is anemic, more than one-quarter of its citizens acquire inadequate food to support physical activity, and more than two-fifths of its children are underweight. Despite a decade of declining food production and growing dependence on food imports, Bangladesh exported 123,698 tons of fishery commodities and 127,508 tons of food crops, depriving each of its citizens of one kilogram of these foods. Even though a majority of its population is anemic and more than two-fifths of its children are underweight, India exported more than 15 million tons of food crops and fish, removing 13 kilograms per capita from the domestic food chain. Pakistan exported 11 kilograms per capita while 25 percent of its population receives inadequate calories for physical activity, and nearly one-third of its children are underweight. Similarly, one-quarter of Cambodians are undernourished, and a high percentage are anemic.[2]

Indonesia, North Korea, Myanmar, the Philippines, Sri Lanka and Vietnam exhibit serious hunger indexes, indicating that 12 to 40 percent of their populations are undernourished, more than one-quarter of citizens routinely receive inadequate calories to sustain physical activity, and about one-fifth of children are underweight. North Korea is the most food insecure country in Asia, with 43 percent of its population undernourished and dependent on international food aid (Relief Web 2019). Despite a famine in the 1990s that caused millions of deaths (Noland et al. 2001) and unrelenting hunger since 2000, North Korea has exhibited declining food production, stagnating fishery outputs, and growing dependence on food imports (FAO 2012b). One-third of its population is anemic, one-fifth of its children are underweight, and more than one-fifth of

2 Export statistics are derived from analysis of FAOSTAT, FAO (2012b) and FAO (2012e).

TABLE 2 Indicators of food insecurity, 2016

Part A. Low human development Index

Fishery territory	Global hunger index 2010	% average annual population growth, 2000–2010	% annual increase or (decrease) in food production, 2000–2010	% population below poverty at $2 PPP per day	% employed in agriculture	% population under-nourished (insufficient calories)	% children under 5 underweight	Iron deficiency Anemia: WHO severity rank
[a]Bangladesh	Alarming	1.6	(1.5)	47.5	47.5	26.0	41.3	Severe
Myanmar	Serious	1.1	6.3	32.0	70.0	21.7	29.6	Severe
[a]North Korea	Serious	0.5	(0.2)	41.0	23.4	39.7	18.8	High
[a]Pakistan	Alarming	1.5	0.7	45.1	45.1	25.0	31.3	High

Part B. Medium human development index

[a]Cambodia	Alarming	1.7	3.9	72.3	72.3	25.0	28.8	Severe
China-Mainland	Moderate	0.5	3.9	36.7	36.7	11.6	4.6	Moderate
[a]India	Alarming	1.3	4.5	53.1	53.1	19.0	43.5	Severe
[a]Indonesia	Serious	0.9	4.1	38.3	38.3	11.9	17.5	Severe
[a]Philippines	Serious	1.8	2.2	33.2	33.2	15.9	20.7	High

[a]Sri Lanka	Serious	0.9	4.8	32.5	32.5	25.7	21.6	High
Thailand	Moderate	0.5	3.3	38.2	38.2	16.0	7.0	Moderate
Vietnam	Serious	1.0	3.8	49.5	40.5	12.5	20.2	High
Part C. High human development index								
China-Taiwan	Low	0.4	1.6	5.2	5.2	4.0	10.1	Mild
Japan	Low	−0.1	(1.3)	3.2	4.1	1.6	3.0	Mild
Malaysia	Moderate	1.5	3.8	14.2	14.2	4.0	12.9	High
South Korea	Low	0.2	0.4	6.6	6.6	2.3	11.2	Moderate

a FAO low-income food-deficit countries (FAO 2011a). Global Hunger Indexes are from Concern Worldwide (2010).

SOURCES AND NOTES: AGGREGATION AND ANALYSIS OF DATA FROM ADB (2010), IFPRI (2012), HTTP://DATAWORLDBANK.ORG, FAOSTAT, UNITED NATIONS (2011), AND WHO (2008)

its pregnant and lactating women are malnourished (FAO 2015).[3] Despite those trends, North Korea exported more than 61 million tons of fish and food crops in 2010. More than one-fifth of the citizens of Myanmar lack sufficient calories to sustain physical activity while nearly one-third of its children are underweight. Even though a majority of its citizens are anemic, Myanmar exported more than 2.7 millions tons of foods, eliminating 46 kilograms of food per capita from the domestic supply. Even though one-third of Sri Lankans are anemic, the country shipped out nearly one million tons or 47 kilograms per capita. Despite significant expansion of food production since 2000, 13 percent of Vietnamese and 12 percent of Indonesians acquire insufficient calories to sustain physical activity, and one-fifth of the children of these countries are underweight. Despite these food insecurity indicators, Vietnam exported 6.2 million tons of food crops and seafoods, withdrawing 71 kilograms of food per capita from its citizens, one-third of whom are anemic. While Indonesia ranks among the world's top food and fishery exporters (FAO 2012b), more than two-fifths of Indonesians are anemic. The country exported 21 million tons, narrowing the domestic food supply by 88 food kilograms per capita.

China, Malaysia and Thailand may exhibit moderate hunger indexes, but they are not food secure. China and Malaysia are net food importers while Thailand barely breaks even in its exchange of food exports and imports. All three countries could ameliorate domestic nutritional shortfalls by allocating less fish to export and nonfood uses (see Table 3). Even though one-third of its population is anemic, Malaysia exported 9.5 million tons of food crops and fish, amounting to 336 kilograms per capita, the highest food export rate of these Asian fisheries. Nearly one-fifth of Thai citizens lack access to sufficient calories to sustain physical activity, one-fifth to one-quarter are anemic, and the state must implement public strategies to overcome childhood nutritional problems (FAO 2012b). In the face of those hunger problems, Thailand shipped out nearly 15 million tons or 226 kilograms per capita, ranking it the third highest food exporter in these Asian fisheries. While China produced 49.2 kilograms per capita, only 27.2 of them were consumed by its citizens. Despite clear need for use of its resources domestically, China exported 24.5 million tons of food crops and fish or 18 kilograms per capita.

While Taiwan, Japan and South Korea exhibit low hunger indexes, they are far from food self-sufficient. Domestic food production has declined or stagnated over the last decade, as these countries have become increasingly dependent on food imports (FAO 2012b). Despite these trends, Japan exported

3 In 2015, North Korea lost half its food crop production to the worst drought in a century (Sang-Hun 2015).

TABLE 3 What happens to fishery production? How exporting, nonfood uses and wastage threaten food security, 2016

Part A. Asian fisheries with alarming or serious global hunger index in 2010

Fishery territory	MT edible fish produced	Production KG per capita	(MT edible fish exported)	(MT nonfoods)	(MT fishery wastage)	MT production remaining for domestic consumption	% production available for domestic consumption	KG per capita available for domestic consumption	KG above or (below) world per capita consumption
[a]Bangladesh	3,878,324	23.8	71,976	32,264	1,241,064	2,533,020	65.3	15.5	(4.8)
[a]Cambodia	802,450	50.7	26,601	79,197	256,784	439,868	54.8	27.8	7.5
[a]India	10,761,756	8.1	1,032,334	787,208	3,443,762	5,498,452	51.1	4.1	(16.2)
[a]Indonesia	11,492,258	44.1	836,898	930,204	3,677,523	6,047,633	52.6	23.2	2.9
Myanmar	3,090,004	56.8	329,096	677,461	988,801	1,094,646	35.4	20.1	(0.2)
[a]North Korea	247,100	9.8	58,840	27,030	79,072	82,158	33.3	3.3	(17.0)
[a]Pakistan	376,391	2.0	131,747	114,831	120,445	9,368	2.5	0.5	(19.8)
[a]Philippines	2,821,223	27.6	257,219	51,452	902,791	1,609,761	57.1	15.7	(4.6)
[a]Sri Lanka	550,547	26.5	17,783	18,456	176,175	338,133	61.4	16.3	(4.0)
Vietnam	6,410,478	67.9	1,468,596	617,968	2,051,353	2,272,561	35.5	24.1	3.8

TABLE 3 What happens to fishery production? How exporting, nonfood uses and wastage threaten food security, 2016 (*Cont.*)

Fishery territory	MT edible fish produced	Production KG per capita	(MT edible fish exported)	(MT nonfoods)	(MT fishery wastage)	MT production remaining for domestic consumption	% production available for domestic consumption	KG per capita available for domestic consumption	KG above or (below) world per capita consumption
Part B. Asian fisheries with moderate global hunger index in 2010									
China-Mainland	66,808,381	49.2	4,086,464	3,701,763	21,378,682	37,641,472	56.3	27.7	7.4
Malaysia	1,782,189	58.0	248,749	309,362	570,300	653,778	36.7	21.3	1.0
Thailand	2,493,154	36.6	1,353,863	563,488	797,809	222,006	8.9	3.3	(17.0)
Part C. Asian fisheries with low global hunger index in 2010									
China-Taiwan	1,005,293	42.7	682,824	76,434	321,694	75,659	7.5	3.2	(17.1)
Japan	3,872,324	30.7	502,858	893,750	1,239,144	1,236,572	31.9	9.8	(10.5)
South Korea	1,894,408	37.5	485,027	177,098	606,210	626,073	33.1	12.4	(7.9)

a low-income food-deficit countries (FAO 2011a). World per capita consumption = 20.3 KG. Global Hunger Indexes are from Concern Worldwide (2010).

SOURCES AND NOTES: ANALYSIS OF DATA THAT WERE AGGREGATED FROM GLOBAL FISHERY AND AQUACULTURE DATABASES, FAO. PHILIPPINE EXPORTS AND NONFOODS ARE FROM PHILIPPINE ANNUAL FISHERIES PROFILE (2016). NONFOODS WERE ESTIMATED USING THE LATEST FAO (2016: 67–68) FOOD BALANCE SHEETS. WASTE WAS ESTIMATED AT 32% (SEE FIGURE 11)

more than 2 million tons of foodstuffs, a majority of it in fishery products. Even though Japan produced 30.7 kilograms of fish and shellfish per capita, its citizens had access to less than ten kilograms per capita (see Table 3). Even though South Koreans consume less than recommended levels of protein, vegetables and fruits (FAO 2012b) and exhibit a moderate incidence of anemia, the country exports more than 3 million tons or 61 kilograms per capita. While South Korea produced 37.5 kilograms of fish and shellfish per capita, only one-third of those foods were available for domestic consumption (see Table 3).

1.1 *Child Food Insecurity*

Despite rapid growth of regional food exports (FAO 2012b), Asia is ranked as one of the world's hot spots of child malnutrition and food insecurity. Ramachandran (2007: 219) observes that:

> endemic pockets of hunger remain, seasonal shortfalls are manifest, and malnutrition is widespread across the region, women and children being the greatest sufferers. The *Asian enigma*, as it is termed, has defied all attempts at resolution so far. Poverty alleviation strategies, livelihood generation programmes and direct food interventions have all been tried, to little avail. ... Even most food deficit countries of sub-Saharan Africa score higher in terms of nutrition levels of their women and children.

Throughout Asia, the incidence of under-nutrition among rural children younger than twelve is alarmingly high, and half of them are so under-weight and stunted they are harmed for life (McLean et. al 2009; Saxena 2008).

1.2 *Iron Deficiency Anemia*

Two-thirds of Asian preschool children and two-thirds of Asian pregnant and lactating women are anemic (McLean et. al 2009; IFPRI 2016). Indeed, iron deficiency anemia is feminized. The incidence of female anemia is *severe* (impacting 41 percent or more) throughout South and Southeast Asia and *high* (impacting 30 to 40 percent) throughout East Asia (McLean et. al 2009).[4] Two-fifths to nearly half the females of Bangladesh, India, Indonesia, Myanmar, and the Philippines suffer from anemia (McLean et. al 2009). This nutritional disease impacts females who reside in Malaysia and Pakistan to about the same degree, even though these countries vary significantly in incidence of poverty and economic growth. China, South Korea and Vietnam are experiencing rapid

4 Anemia is mild (15 percent or less) only in Japan.

entry of women into the industrial labor force, but they exhibit female anemia at about the same level as Thailand and Sri Lanka which are much less industrialized. China, Malaysia, Thailand, South Korea and Japan receive moderate to low hunger indexes, but these countries exhibit higher incidence of female anemia than any other food insecurity indicator (see Table 2). In China, for example, the percentage of anemic pregnant women is 2.5 times greater than the percentage of the population that is undernourished.

1.3 *Asian Fishery Production and Nutritional Trends*

It is quite striking that Asian fisheries that differ sharply in economic growth rates and degrees of industrialization exhibit similar trends with respect to food insecurity indicating that increased trade and prosperity have not solved national hunger problems. In addition to widespread inadequate calorie intake, most Asians secure 60 percent of their calories from carbohydrates (primarily grains), leading to significant shortfalls of protein, iron and other essential nutrients (FAO 2012b: 9, 15–16). As a result, the four most widespread nutritional deficiencies in Asia are inadequate levels of protein, iron, Vitamin A and iodine, shortfalls that are suffered most extremely by rural women and children (ESCAP 2010). In addition to a high incidence of iron deficiency anemia, 72 percent of preschool children and 60 percent of pregnant women exhibit Vitamin A deficiency, the most common cause of blindness and a contributing factor in infant mortality and childhood growth retardation.[5] In South and Southeast Asia, there is a high incidence of iodine deficiency, the main cause of mental retardation.[6] Across Asia, the most abundant foods available to address these nutritional deficiencies are fishery derivatives, but current health trends make it clear that a high proportion of Asians are not consuming the seafoods in which their fisheries specialize.

In 2010, Asia accounted for 60.8 percent of the world's fish that were captured in oceans and coastal waters, 43 percent of fish captured from inland rivers, and 89 percent of aquaculture outputs (FAO 2012d). More than half of the world's captured fish are produced by our target sixteen Asian fisheries which are among the world's most significant fishery exporters.[7] More than 87 percent of people employed in the fisheries sector in 2010 were in Asia, and 97 percent of all fish farmers were Asians. However, thirteen of these fisheries exhibit moderate to alarming hunger indexes (see Table 2), and seven of them are classified by the Food and Agriculture Organization as *low-income*

5 WHO Global Database on Vitamin A Deficiency.
6 WHO Global Database on Iodine Deficiency.
7 Analysis of FAO (2018).

food-deficient nations. Similarly, fourteen of these Asian fisheries ranked among the top thirty aquaculture producers in the world, but five of these high exporters were food-deficient.[8]

2 Investigative Questions

Obviously, we should question why significant nutritional shortfalls are occurring in the very region that generates a majority of the world's fishery and aquaculture production. Since domestic consumption of agricultural and fishery production could be significant in the alleviation of Asian undernutrition and shortfalls of protein, iron, Vitamin A and iodine, we will explore eight questions:

1. To what extent is food and fishery exporting a food security problem?
2. Will dependence on imports solve Asian food security problems?
3. To what degree do production of and conversion to nonfoods threaten Asian food security?
4. Will aquaculture solve Asian nutritional shortfalls?
5. How does depeasantization threaten Asian food security?
6. To what extent does ecological degradation of fisheries threaten Asian food security?
7. How do intra-national inequalities complicate Asian food insecurity?
8. What are the impacts of wastage on Asian food security?

3 Conflict between Food Security and Food/Fishery Exporting

Philippine scholar Renato Constantino (1988: 17) contends that: "the principal bait for the shift to export crops is the prospect of foreign exchange to repay external debts." By the turn of the 21st century, fourteen of the Asian fisheries were trapped in a vicious circle of debt/trade/more debt (SAPRIN 2004). Their export strategies are designed to accumulate foreign exchange to repay loans that were incurred to fund export agendas that, in turn, may not generate enough revenue to offset those transnational debts (Tyner 2004). Between

8 The food deficient high capture fisheries were Bangladesh, India, Indonesia, North Korea, Pakistan, the Philippines, and Sri Lanka. The food deficient high aquaculture producers were Bangladesh, India, Indonesia, Pakistan, and the Philippines. Note that Bangladesh, India, Indonesia, Pakistan, and the Philippines were food-deficient even though they were high producers/exporters in both fishery categories.

1990 and 2010, East Asian countries expanded their debt fourteenfold, South Asian nations more than doubled their debt load, and Southeast Asian states expanded their debt 154 percent. By 2010, debt represented more than 38 percent of Gross National Income of South Asian countries and nearly 40 percent of Southeast Asian GNI. In the face of high levels of poverty and hunger, debt ratios per capita are staggering: $1,283 for East Asians, $246 for South Asians, and $751 for Southeast Asians. In South Asia where hunger is most problematic, national debt averages 69 percent of the Gross Domestic Product. In Asian low-income food-deficient countries, national debt averages 67 percent of the Gross Domestic Product.[9]

To implement structural adjustment goals set by the IMF and the World Bank, Asian fisheries have targeted their ecological resources, expanded their food exports, and deepened their integration into the world agro-industrial food system. Following guidance from the IMF and World Bank since the early 1990s, Asian fisheries have redirected their agricultural growth into production of export commodities that are expected to generate foreign exchange for debt repayment (Tyner 2004). Despite serious hunger problems, Asian governments have allocated agricultural lands to nonfood crops, livestock pastures and fishponds in order to prioritize export of a higher percentage of their food and fishery production. Such structural adjustment programs have led to increased hunger throughout a majority of these Asian fisheries. "Adjustment measures have been designed based on the assumption that local supply is not important, as access to food could be obtained through the market" (SAPRIN 2004: 8, 140). This philosophy is grounded in two key neoliberal notions, i.e., that trade is the central food security solution and that the success of any food security strategy is measured by its positive impacts on economic growth (Guha-Khasnobis et al. 2007: 307–309). To complicate matters, these Asian fisheries have increased food importing to comply with World Trade Organization rules, further threatening the declining incomes of rural Asian households (GuhaKhasnobis et al. 2007; SAPRIN 2004).

3.1 *Fishery Exporting*

In 2016, thirteen of these sixteen Asian fisheries ranked among the world's top fifty exporters (see Table 1). In line with structural adjustment and WTO requirements, they expanded their fishery and food crop exporting since 1985 (FAO 1989, 2012e), even though all of them except Japan have experienced hunger crises during this period. Despite their alarming, serious or moderate

9 Analysis of ADB (2012: 134, 235), with dollars standardized to 2010 value.

hunger indexes, India, Indonesia, Malaysia, Myanmar, Sri Lanka, Thailand and Vietnam attained trade surpluses in exchanges of food commodities. Trade statistics make clear the food insecurity of four countries that are experiencing alarming or serious hunger problems. While China, Japan, and South Korea exchange manufactured goods for food imports, Bangladesh, North Korea, Pakistan, and the Philippines exhibit large food trade deficits. Since 1975, fishery and aquaculture outputs have expanded sufficiently to alleviate many of the region's nutritional problems (Hersoug 2004: 59), but much of that output has been exported (APFC 2012). Between 1988 and 2002, the value of fishery exports from many developing countries exceeded the value of other agricultural commodities (Eggert and Greaker 2009: 1). Indeed, these sixteen Asian fisheries prioritize seafood exporting because shellfish are more valuable per ton on world markets than agricultural crops (see Figure 5).

3.2 *Threats to Asian Agricultural Production*

The food security threats associated with fishery exporting are exacerbated by the elimination of agricultural space. In all the Asian fisheries, national and local governments have stimulated the conversion of croplands and domestic-oriented aquaculture to commercial fishponds (Bailey and Skladany 1991; Primavera 1997; FAO 2004a, 2007). In the face of expansion of commercial fishponds and other nonagricultural demands, expanding cultivated lands for food production is no longer an option in the sixteen Asian fisheries where

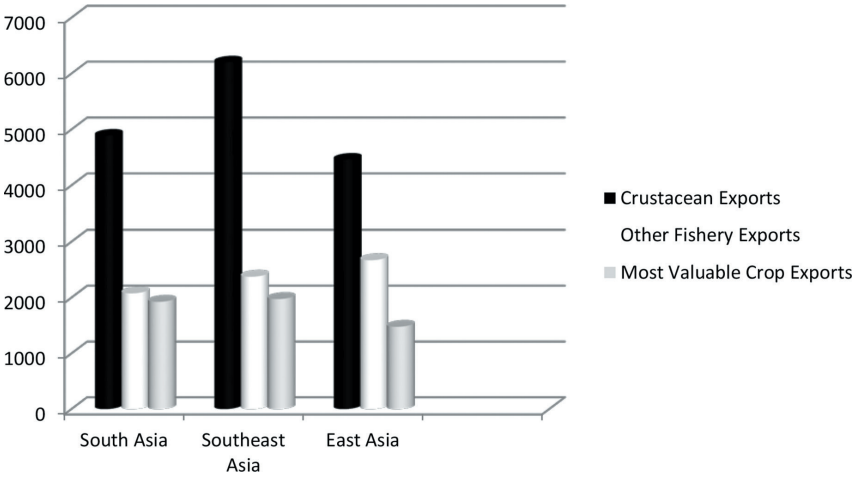


FIGURE 5 The economic importance of crustacean exports: $US per exported ton of commodities, 2016

SOURCE AND NOTES: ANALYSIS OF EXPORT DATA THAT WERE AGGREGATED FROM UNCOMTRADE DATABASE

arable land declined from 0.36 hectares in 1970 to 0.20 in 2011. East and Southeast Asia have suffered a 37 percent decline in arable lands while arable lands dropped 58 percent in South Asia. Moreover, gains from the artificial inputs of the Green Revolution waned in the 1990s, making declining yields per hectare common (ADB 2013: 40–43). To complicate matters, most arable farm lands are not used to cultivate crops for domestic consumption.

When we compare agricultural exports (United Nations 2013) with crop production data (FAO 2012c), it becomes clear that these Asian fisheries prioritize crops for export rather than domestic food security. Fourteen of them allocate more of their agricultural lands to the production of carbohydrates and sugar than to food crops that will address nutritional problems. Grains, sugar cane/beets, bananas, coconuts, and vegetables address some local consumption needs, but these crops are exported at high levels. Only China, Japan, North Korea and South Korea cultivate non-starchy vegetables as one of their three most important crop categories that can be applied toward domestic consumption. Food security is further threatened because less of the agricultural land is allocated to the production of food crops than to nonfoods (see Table 10). For example, food-deficient Sri Lanka allocates a majority of its lands to the production of tea while food-deficient India, Indonesia and the Philippines allocate significant land resources to cultivation of cotton, palm oil, rubber, and tobacco. Moderately food-insecure Malaysia depends on food imports while it utilizes most of its agricultural lands to cultivate palm oil and rubber for export.

3.3 *Centrality of Fishery Outputs to Asian Nutrition*

Bottom line, there is no significant crop production in any of these Asian fisheries that will offset the losses of protein, iron and other nutrients that result from fishery exporting. Except for Japan and Taiwan, all these fisheries exhibit a moderate to severe incidence of iron deficiency anemia (see Table 2). Fishery products are the resources most readily available that could be locally consumed to overcome their widespread protein, iron and iodine shortfalls (McLean et al. 2009). Table 3 provides a sharp analysis of the threats to Asian food security posed by export of fishery products. When wastage and nonfood uses are taken into account, none of these Asian fisheries produces enough fish to meet domestic needs. In reality, so much fishery output is lost to wastage that there is no latitude for nonfood uses or exports. It is clear, however, that these Asian fisheries are prioritizing exports and nonfood applications over domestic consumption. In 2016, per capita world consumption of fishery commodities rose to 20.3 kilograms. It is reasonable to expect that domestic consumption in these Asian fisheries should exceed that global average, but

that is not the case. Eight of the ten Asian fisheries with alarming or serious hunger indexes consumed less than the typical world citizen (see Table 3). Fishery commodities are barely consumed in India, Pakistan and Thailand where they could help to alleviate moderate to alarming hunger indexes. In Bangladesh, Pakistan, North Korea, Thailand, Taiwan, Japan, South Korea, the Philippines and Sri Lanka, domestic consumption per capita is half or less than it was in 1961 (Kent 2018).

Three cautions about methodological flaws are in order with respect to Table 3. First, FAO estimates of nonfoods are low, based primarily on reservations for seeds and feeds at production sites. Indeed, the FAO Food Balance Sheets from which we drew data do not include conversion into nonfoods after leaving the production sites. Second, the FAO has only recently begun to estimate losses at the production sites, but Food Balance Sheets do not estimate fishery wastage after commodities leave the production sites. For that reason, we employed wastage estimates from the most recent research about Asian countries. Third, FAO export numbers are not always reliable, and it is likely that more fish were exported from these Asian territories than the FAO Food Balance Sheets report. According to the Food and Agriculture Organization (2012b: 41, 58), nearly 60 percent of the world's captured and farmed fish are destined for export. Since a majority of the world's fishery production occurs in these sixteen Asian fisheries, it is likely that the FAO (2012e) national exporting proportions that we used for this table are lower than the actual levels. Indeed, export quantities for these Asian fisheries are often higher in the UN COMTRADE International Trade Statistics database. By repeating these FAO methodological flaws, a majority of analysts who study Asian food security offer optimistic estimates about per capita domestic consumption because they ignore or seriously underestimate exports, nonfood uses and wastage.[10]

Table 4 demonstrates that consumption of fishery commodities has declined below FAO estimates. Since the early 1990s, fishery consumption per capita has steadily declined in these Asian fisheries, as exporting has led to rising domestic prices, especially for shellfish (Mulekom et al. 2006: 554–55). By 2010, average Asian per capita fish consumption was much lower than the consumption levels of North Americans and Europeans. Bangladesh, India, Indonesia, Myanmar, Pakistan and Vietnam fall well below average per capita consumption reported by the FAO (2012d) for Asia. Moreover, per capita fish consumption for India and Pakistan is about one-fifth of the average per capita consumption reported by FAO (2012d) for all low-income food-deficient

10 See, for example, the overestimation of China's human consumption levels because Chen and Duncan (2008: 188) ignored both nonfoods and wastage.

countries. Despite its production and high export levels, Pakistan now exhibits the lowest per capita consumption of fish in the world. Even though India is the seventh top ocean fish producing country (Siar and Kusakabe 2020: 23), most Indians have included very little fish in their diets since the shift to shrimp exporting in the early 1980s. In 1980, the largest peasant fisher's organization publicly protested against the Indian government's establishment of a multi-million dollar fishing complex at Bombay, emphasizing the danger of the country's shift to prioritizing exporting.

> The developed world is now making strident demands for our fish varieties. ... If this trend continues, the Indian population will have to do without fish since the foreign buyers are ready to pay ten times the amount a poor Indian could afford. Can we allow our fish which is our vital food resources to be exported at the cost of the protein-starved population of our country, even if the principle involved is the highly questionable foreign exchange earnings?[11] (Kent 2018: 19)

In 2012, domestic fish prices were 1.4 times greater than beef and 1.5 times greater than chicken. As a result, India ranks 116 out of 160 countries in its per capita consumption of fish (Indian Dept. of Fisheries 2019), and two coastal provinces account for 90 percent of Indian fishery consumption (Kent 2018: 85–88).

Similarly, North Koreans could not possibly be consuming the 45 kilograms per capita estimated by FAOSTAT. In short, most of these fisheries are able to export because they withdraw resources from the domestic consumption pool. Indeed, fish and shellfish shortfalls have been reported in newspaper and NGO accounts since the mid-1990s (Wilks 1995; Environmental Justice Foundation 2003; Wilkinson 2010). Whatever the optimistic statistical estimates indicate, there is a more empirical barometer of the degree to which Asians lack access to the fish produced domestically. Declining consumption of indigenous high-protein, high-iron fish lies at the heart of the high to severe incidence of anemia and protein shortfalls in most of these Asian fisheries (see Table 2), as well as the high incidence of iodine and Vitamin A deficiencies.[12] If there were not large segments of the Asian populations that eat very little of the high-iron finfish, shellfish, and mollusks, national levels of these nutritional shortfalls would not be so high among Asian women and children. On average in 2013,

11 This was the National Forum for Catamaran and Country Boat Fishermen's Rights.

12 WHO Global Database on Iodine Deficiency; WHO Global Database on Vitamin A Deficiency.

TABLE 4 Per capita dietary protein consumption, 2013

Territory	% fish protein	% animal protein	% plant protein
Bangladesh	10.4	18.5	71.1
Cambodia	20.0	29.1	50.9
China-Mainland	9.1	40.5	50.4
China-Taiwan	9.6	48.1	42.3
India	3.0	20.3	76.7
Indonesia	16.3	26.0	57.7
Japan	20.0	55.3	24.7
Malaysia	21.6	55.6	22.8
Myanmar	19.8	42.6	37.6
North Korea	5.4	18.8	75.8
Pakistan	1.0	41.7	57.3
Philippines	14.9	41.1	44.0
South Korea	16.4	48.0	35.6
Sri Lanka	15.3	27.5	57.2
Thailand	13.5	40.5	46.0
Viet Nam	11.2	52.9	35.9

SOURCE: ANALYSIS OF FOOD BALANCE STATISTICS, FAOSTAT

fish accounted for only 12.9 percent of protein consumed in the Asian fisheries, showing a clear trend toward substitution of animal and plant proteins.

4 Dependence on Imports as Threat to Food Security

Worldwide disparities among income levels produce *unequal exchange*, the structural process through which capitalists drain off an inequitable share of economic surpluses (Emmanuel 1972: 371–2). According to Donald Clelland,

> This unequal exchange occurs because of the super-exploitation of peripheral labor, resources and environment. By its logic, unequal exchange is not just about international trade or even trade between unequally developed regions. It is about unequal exchange (conflict) between higher income and lower income sectors in different areas of the world-system. Workers who do the same tasks with similar equipment earn income levels that differ by as much as a ratio of fifty to one or more

> between zones. Fundamentally, unpaid and under-paid labor and natural resources are derived from worker households and communities that are not remunerated at a level that will cover the actual costs of their survival and reproduction. I refer to these unpaid labors and resources as *dark value drains* that are hidden, uncosted, embedded in cheap consumer prices, and concealed in profit accumulation. The uncosted peripheral hours remain embedded in the purchased product but are not reflected in the price of the product. As a result, the worker in a rich country becomes an unwitting beneficiary of this unequal exchange. He/she can purchase for one waged hour of his/her own work food that requires ten lower-waged hours of peripheral labor.[13]

Consequently, the unequal exchanges and dark value drains (Clelland 2013, 2014) within the commodity chains of the global food trade generate disproportionate per capita consumption by the richest countries and underconsumption by the developing countries– in terms of both calorie intake and nutrient density. Through *nutritional unequal exchanges* between richer countries and developing countries, the richer countries acquire a disproportionate share of the world's most nutritious foods at very cheap costs, so they exhibit the lowest levels of domestic malnutrition.[14] We should think of these nutritional unequal exchanges as a *regime of forced underconsumption*. Indeed, the world food system is nutritionally bifurcated, grounded in insufficient resources and "coerced underconsumption" for the hungriest producing zones and "privileged overconsumption" in the least hungry, richer zones that devour the most nutritiously valuable foods (Araghi 2009: 120, 142) By lowering the household consumption of laboring fishers, these inequitable trading patterns increase capitalist profits by causing hunger and malnutrition.

Moreover, greater ecological degradation is externalized to the hungrier, producing zones. Harriet Friedmann (1992) refers to *ecologies at a distance* because nutrients and their embedded labor power are exported far from the producing areas that bear the brunt of natural resource drains and environmental damage. Through this *ecological unequal exchange*, there is "environmentally

13 We thank Professor Clelland (1935–2021) for providing this unpublished theoretical explanation not long before he died. For his published work on dark value drains, see Clelland (2013, 2014, 2015a, 2015b).

14 Asche et al. (2015) analyze a "seafood trade deficit" in which developing countries engage in the pattern of exporting higher valued seafood and importing lower valued seafood. However, they do not draw any direct connections to *nutritional* inequality.

damaging withdrawal of energy and other natural resource assets." However, richer countries that consume the highest levels of natural resources "are typically characterized by the lowest domestic levels of environmental degradation" (Jorgensen and Rice 2012: 432). For example, countries that import palm oil externalize to the producing countries loss of vast areas of forest and the displacement of thousands of food-producing peasant households (Sommer et al. 2020; Gellert 2015; Hall 2011). In similar fashion, market prices do not take into account the full ecological cost of fishing. Distant consumers

> do not pay for the cost of the future reproduction [that] the fish will no longer accomplish, or the cost of ecosystem disruption from overfishing, or the other fish or bird species that were caught incidental to the catching of that fish. And [consumers] certainly do not pay for the harm that fishing technologies impose on the ecosystem. (DeSombre and Barkin 2011: 19)

While several Asian governments have established rice controls and consumer subsidies (FAO 2003c: 188–96), no Asian state regulates fish in ways that prioritize local consumption. As a result, more than two-thirds of the 2012 Asian fishery exports were marketed to developed countries that do not have food shortfalls (FAO 2012b: 41, 70). In 2017, the Asian fisheries marketed a majority of their exports to countries that exhibited low hunger indexes (see Table 5). Seven of the ten countries with serious to alarming hunger indexes marketed more than three-quarters of their fishing commodities to western, Middle Eastern and Asian low hunger zones. With moderate hunger indexes, China, Malaysia and Thailand, exported three-fifths to three-quarters of their fishery commodities to low hunger western countries and to Japan, Taiwan and South Korea. In short, Asian fisheries are feeding over-nourished buyers who have sufficient food intake without Asian exports while their own citizens face nutritional shortfalls. Even though they produced nearly two-thirds of the world's seafoods in 2016, these Asian fisheries fell below or only slightly above average world per capita consumption of the finfish, shellfish and mollusks they exported. Indeed, eight of the fisheries with the worst Hunger Indexes fell below the world consumption average. Despite their low hunger indexes, their high incomes and their traditional high-fish diets, Taiwan, Japan, and South Korea fell significantly below world per capita consumption (see Table 3). Clearly, all these Asian fisheries are shifting away from traditional patterns of healthy fish consumption (see Table 4) in order to export their outputs to areas of the world that are experiencing little hunger (see Table 5).

TABLE 5 Nutritional unequal exchange: Exports of fishery foods from high hunger zones to low hunger zones, 2017

Country ranked alarming or serious on the 2010 global hunger index	% fishery exports to western low hunger zones	% fishery exports to Asian low hunger zones	% fishery exports to Middle Eastern low hunger zones	% fishery exports to Asian moderate hunger zones	Total % of fishery exports to lower hunger zones
Part A. Asian fisheries with alarming or serious global hunger index in 2010					
Bangladesh	77.3	4.6	0.3	13.3	95.5
Cambodia	6.0			94.0	94.0
India	48.8	8.3	3.5	36.3	96.9
Indonesia	50.5	20.8	0.2	21.4	92.9
Myanmar	18.6	20.5		47.9	87.0
North Korea		0.2		47.9	99.6
Pakistan	2.0	3.1	14.6	71.3	91.0
Philippines	33.7	26.7	12.5		72.9
Sri Lanka	60.8	17.6	8.0	4.1	90.5
Viet Nam	15.5	39.7	1.2	27.2	83.6
Part B. Asian fisheries with moderate global hunger index in 2010					
China-Mainland	31.1	43.2			74.3
Malaysia	11.1	45.8	0.7		57.6
Thailand	35.5	37.9	1.0		74.4

SOURCES: ANALYSIS OF THE LIST OF THE TOP 25 IMPORTING MARKETS FOR THE FISHERY EXPORTS OF EACH COUNTRY (SHOWING $US VALUE), TRADE INDICATORS, TRADE MAP DATABASE, INTERNATIONAL TRADE CENTRE. GLOBAL HUNGER INDEXES ARE FROM CONCERN WORLDWIDE (2010).

4.1 *How Is the Food Import Budget Spent?*

Since the late 1980s, United Nations policy has been grounded in the philosophy that economic globalization offers opportunities for integrating the rural poor and for achieving food security in the Global South. Consequently, the Food and Agriculture Organization advocates that

> farmers need to develop a greater knowledge of global-agricultural trends in order to produce crops that will be competitive on the global market. ... The FAO's focus is less on how neoliberal and developmental economic theory/policy has contributed to hunger and poverty than on how globalization can benefit the poor through the implementation of new policies. ... By avoiding a more rigorous critique of neoliberal and developmental economic theory, FAO remains married to the belief that economic growth, competition, efficiency, and profiteering hold the answer to achieving food security. (Schanbacher 2010: 9)

FAO policy emphasizes economic growth, integration into the global food trade system, and smallholder adaptation of imported Green, Blue and Genetic technologies. If trade liberalization worsens domestic conditions, the FAO explains, it is because national governments fail to offer social safety nets (FAO 2006a: 30–31), not because the global economic development agenda is biased in favor of the richest countries and their massive agribusinesses.

Consequently, the 1996 World Food Summit grounded global food security in the market-oriented world trade system. The 186 country representatives agreed that "trade is a key element in achieving world food security." According to their reasoning, trade "allows domestic food consumption to be met more cheaply by less costly imported supplies," and it "increases consumer choice by providing access to a greater range and diversity of foods" (World Food Summit 1996: Point 3.6). It is striking that the World Food Summit ignored price instabilities in the world food trade. Rising and erratic food prices represent a major risk facing Asian countries that depend on food imports (FAO 2019a). The food price index barely changed in developed countries over the decade between 2002 and 2012. Consumers in richer countries, including Japan, benefitted from stable pricing and from the cheap export prices of developing countries. In contrast, food prices were erratic and inflationary (and volatile from month to month) for the Asian fisheries.[15] Moreover, delegates overlooked an even more significant problem. The stated policies reflect no concern about

15 Analysis of FAOSTAT data.

whether countries would acquire, through importing, the foods they need to address domestic nutritional shortfalls associated with hunger and disease. Nor did the Summit question whether the capitalists buying foreign foods for resale would select the kinds of nutrients most needed to address domestic needs (Watkins 1996).

Do the Asian fisheries overcome domestic dietary shortfalls through imports, as the FAO (2012d) claims will happen? Table 6 provides an empirical assessment of whether East, South and Southeast Asia import high levels of foods that supply the nutrients missing from domestic production and/or drained away by exporting. Even though the food-deficient fisheries exhibited high per capita deficits of high iron/protein foods, they did not prioritize those nutritional shortfalls. On average in 2016, they expended nearly 78 percent of their food import budgets on high fat/sugar and non-caloric foods and less than 10 percent to acquire high iron/protein foods. Despite its serious hunger index, Myanmar was the most extreme outlier because nearly 99 percent of its imports were high fat/sugar commodities and only one percent were high iron/protein foods. This trend reflects the global homogenization of dietary consumption and capitalist marketing to wealthier consumers. In 2011, ten commodities accounted for more than 80 percent of the world's trade foods, and the trading of oils and fats grew faster than any other traded foods (Falconi et al. 2017: 147). Throughout the sixteen Asian fisheries, "much of the foreign exchange earned from the export of foods is not devoted to purchasing low cost nutritive foods for the needy, but is diverted to the purchase of luxury foods and other products in demand by local elites" (Mulekom et al. 2006: 550).

Indeed, all ten fisheries ranked with alarming or serious hunger indexes experienced per capita deficits of high-iron foods and of nutrient dense fishery products. However, they expended two-thirds or more of their food import budgets on commodities that (a) lacked the nutrients to address domestic health shortfalls and (b) were unhealthy enough to generate new kinds of health problems. What we have found supports the growing body of scholarship that points to a *double burden of malnutrition* in developing countries in which traditional diets are being displaced by a global diet dominated by carbohydrates, fats and sugars. Undernutrition among the poor is accompanied by rising obesity rates and lifestyle diseases in the middle classes (Popkin 2001; Kennedy et al. 2004; Hawkes 2006; Khan and Khoi 2008).

China was the most extreme positive outlier, for it was the only Asian fishery that directly utilized trade to address shortfalls in high iron/protein nutrients. Nearly three-fifths of its imports were high iron/protein foods while nearly 38 percent were high fat/sugar and non-caloric foods. In this regard, China is a stark contrast to its Taiwan province which acquired high iron/protein

TABLE 6 How is the import budget spent? Percentage of total value expended by food category, 2016

Part A. Asian fisheries that were classified as food deficient by FAO in 2010

Fishery territory	High iron & high protein foods	Vegetables & fruits (not high protein)	Foods that convert to sugars & fats in the human body	Non-caloric coffee, tea, spices & yeast	% All food imports that are processed
A [a]Bangladesh	3.1	20.9	72.0	4.0	8.7
A [a]Cambodia	8.6	9.5	81.5	0.4	3.9
A [a]India	9.2	18.9	69.2	2.7	6.4
A [a]Pakistan	3.2	13.0	78.5	5.3	8.1
S [a]Indonesia	20.9	12.2	65.3	1.6	26.7
S [a]North Korea	13.0	10.0	72.4	4.6	38.2
S [a]Philippines	15.2	4.2	77.7	2.9	36.3
S [a]Sri Lanka	4.3	11.4	69.2	15.1	14.5

Part B. Asian fisheries that were not classified as food deficient by FAO in 2010

S Myanmar	1.0	0.3	97.2	1.5	45.3
S Vietnam	18.0	6.3	72.5	3.2	32.5
M China-Mainland	59.5	2.9	35.9	1.7	13.1
M Malaysia	15.3	6.4	72.6	5.7	25.7
M Thailand	44.5	3.9	48.2	3.4	33.2
L China-Taiwan	29.3	14.4	54.0	2.3	26.3
L Japan	30.3	34.0	33.2	2.5	26.7
L South Korea	34.3	4.4	58.0	3.3	24.1

a low income food deficient countries (FAO 2011a).

SOURCES AND NOTES: ANALYSIS OF IMPORTS AGGREGATED FROM UN COMTRADE DATABASE. HIGH IRON AND PROTEINS INCLUDE MEATS, FISH, NUTS, EGGS, MILK PRODUCTS, LEGUMES AND SOYA. FOODS THAT ARE METABOLIZED BY THE HUMAN LIVER INTO SUGARS AND FATS INCLUDE RAW AND REFINED SUGARS, HONEY, MOLASSES, SUGAR-BASE PREPARATIONS AND BEVERAGES, FATS AND OILS, AND ALCOHOLIC BEVERAGES. THE LETTERS BEFORE NAMES REFER TO THEIR 2010 GLOBAL HUNGER INDEXES (CONCERN WORLDWIDE 2010); A = ALARMING, S = SERIOUS, M = MODERATE, L = LOW

imports at about half the level of the mainland. Why is China different from the other Asian fisheries? First, China reduced tariffs on agricultural imports in 2004, making it the freest trading partner in the world. Soy is the high protein food that China imports at higher levels than any other, but it is important to emphasize that this plant protein is being substituted for large quantities of much healthier fishery commodities that are exported. Second, China utilizes its economic position in the region to acquire the most nutritious fishery commodities from high-hunger Asian fisheries to which it exports lower-quality frozen and canned finfish (Ji-Kun et al. 2017). Third, China is the only Asian fishery with a mandated national food and nutrition program that places constraints on imports to keep them in line with food security targets. This point of difference brings us to an important point about the minimal back seat role that the Asian fisheries play with respect to national food security.

We have been describing national food import budgets in a way that might mislead readers to think that Asian states make the decisions about what is imported. However, the reality of the world food system makes the pro-market idealism of the World Food Summit (1996) seem ridiculously naive. The rhetoric of the Summit policies assigns to consumers a great deal more agency than they actually have in the food importing process, and it pretends that states will research, plan and advocate the imports most needed to address nutritional needs. In reality, transnational corporations and domestic capitalists select the imports they are convinced will be most profitable, and they often create new local demand for faddish foods and beverages from rich countries (McMichael 2005). Moreover, international trade policies constrain national governments from setting standards that might interfere with free trade (SAPRIN 2002), so states do not regulate food importing with an eye to domestic nutritional needs. Examination of Table 7 and trade data make it clear that private sector importers selected commodities around two opposing goals: (a) cheap less nutritious foods for the poor and (b) more expensive candies, desserts, liquors, beverages, high-fat snacks, and processed convenience foods for middle class and affluent households. In both cases, the outcome is introduction of higher levels of carbohydrates, sugars and fats that not only fail to address nutritional shortfalls but also cause rising levels of obesity (Ng et al. 2014).

4.2 *Nutritional Unequal Exchanges through Food Exports and Imports*

If we apply the recent notion of *nutritional footprint* (Speck et al. 2013), we see that the countries that are characterized by a diet that has both calorie content and nutrient density are the richer countries to which these Asian fisheries export their high iron and high protein foods. While those countries exhibit a *high nutritional footprint*, the Asian fisheries (except Japan) have a

low nutritional footprint because a large segment of their populations consume foods with caloric content that are lacking in nutrient density. In short, the low nutritional footprint of these low to middle income Asian fisheries is associated with negative health outcomes for a sizeable segment of their citizens. Developing countries, like these fishery exporters, are characterized by undernutrition, insufficient proteins and health problems tied to shortfalls in micronutrients, especially iron. These conceptualizations lead us to explore whether these Asian fisheries *trade up nutritionally* in order to acquire crucial imports that will address domestic malnutrition problems.

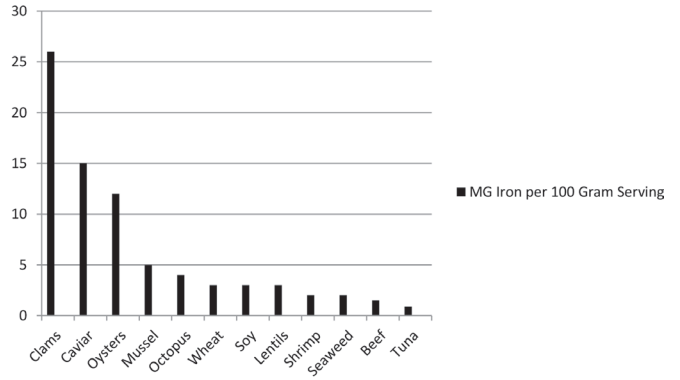
The UN COMTRADE statistical database provides data for 425 finfish, shellfish and mollusk species, identifying those intended for human consumption. Of this list, 253 finfish can be classified as nearly pure protein, and most of the crustaceans and mollusks are high in iron. The database lists separately those shellfish that are exported for human consumption, separating them into *crustacean* and *mollusk* species.[16] Using the Trade Map database of the International Trade Centre, we acquired the quantities of the species of seafoods that were exported and imported by each of the Asian fisheries. Then we used four medical websites to classify those species in terms of their iron and protein content. Exported from Asian fisheries, tuna is the captured fish that is highest in protein while tilapia is the highest protein aquaculture species. In addition, Asian fisheries supply to the world nearly three-quarters of the seafoods that are highest in iron.[17] As Figure 6 shows, the most frequently traded high-iron Asian seafood species are mollusks (clams, octopus, blue mullet, oyster) and crustaceans (prawn/shrimp, crab). However, caviar (fish eggs) and two types of high-iron finfish (sardines, anchovy) are routinely exported. In the face of high levels of domestic anemia and protein shortfalls, these Asian seafoods provide from 2.45 to 23.77 milligrams of iron per three ounce serving to distant healthier consumers.

Since iron deficiency anemia and protein shortfalls are so problematic in the Asian fisheries (see Table 2), we are particularly interested in assessing how well they do in securing high iron and high protein foods through international trade. To analyze these trends, we classified traded foods by nutritional value in order to measure the degree to which crucial nutrients were lost through exports but regained through imports (see Figure 6). Table 5 points to the *nutritional unequal exchange* that results for these Asian fisheries with

16 From Asian fisheries, the primary *crustacean* exports are prawns, shrimp, crab and lobsters while the *mollusks* primarily include oysters, clams, conches, blue mussels, cuttlefish, octopus, squid., and more rarely from the Sea of Japan, abalone, and scallops.

17 Aggregation and analysis of UN COMTRADE statistics.

Part A. Iron content of Asian fishery and agricultural commodities



Part B. Protein content of frequently agricultural commodities

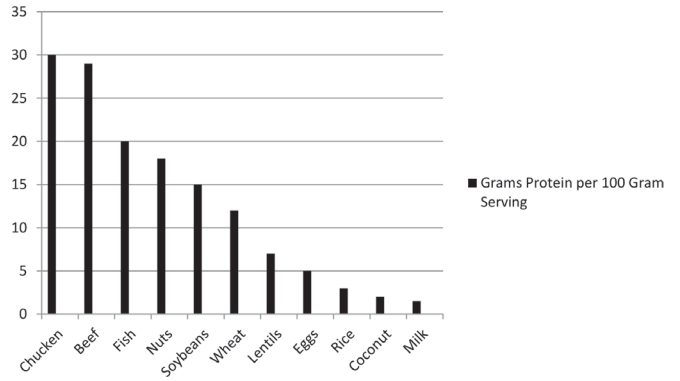


FIGURE 6 Nutritional content of frequently traded asian fishery and agricultural commodities
SOURCE: UNITED STATES DEPARTMENT OF AGRICULTURE FOOD COMPOSITION DATABASE, HTTPS://NDB.NAL.NSDA.GOV/NUTRIENTS/INDEX (ACCESSED 7 AUG. 2021)

respect to export and import of high iron/protein fishery and agricultural commodities that are intended for human consumption. Most of them prioritized the export of fishery commodities over the need for domestic consumption of these seafoods. The thirteen Asian fisheries with moderate to alarming hunger indexes engaged in nutritional unequal exchanges by trading high iron/high protein fishery commodities for less nutritious fish. In contrast, the three Asian fisheries with low hunger indexes traded up nutritionally by exchanging low iron/low protein finfish for high iron/high protein mollusks, shellfish and finfish imported from their Asian neighbors.

Several scholars (e.g., Grote et al. 2005; Spiess 2014) have called attention to the hidden soil nutrients and water that are embodied in exported food crops, and these are ecological unequal exchanges that drain resources inequitably from developing countries. For example, Pengue (2005) estimates that 2002–2003 soybean exports resulted in the extraction of more than 1.2 million tons of nitrogen and phosphorus from Argentinian soils. However, exports also drain food resources from the human populations who produce them (Wimberley and Bello 1992; Wilkinson 2010; Milhalache-O'Keef and Li 2011; Austin et al. 2012). Falconi et al. (2017) have called attention to the *caloric unequal exchanges* involved in international trade, but they focus on the quantity and economic value of exports versus imports and on hidden ecological costs, not on the actual caloric value of the traded commodities. Since the philosophy of the FAO and international development agencies is that food importing is an important strategy for solving world hunger and malnutrition, we must move beyond using weak proxies for human consumption, like trade value. On the one hand, scholarship about loss of natural resources through exporting identifies externalized ecological costs, not hunger or malnutrition. On the other hand, a focus on the caloric content of traded commodities will conceal the *double burden of undernutrition and rising obesity* (Kennedy et al. 2004) that now characterizes most developing countries. Indeed, thirteen of the Asian fisheries expend their import budgets in such a way that the caloric content is primarily in unhealthy fats, sugars and carbohydrates (see Table 6), thereby failing to address major nutritional shortfalls that lead to domestic anemia, childhood stunting and other organic diseases. In order to assess whether importing actually addresses nutritional shortfalls, we need to examine trade exchanges in terms of the nutrients that are embedded in the food commodities that are exported and imported. For that reason, Table 7 compares the iron and protein exchanges that occur in the exporting and importing of fishery commodities.

Do the Asian fisheries acquire or lose high iron and high protein fishery commodities through importing? On average, these high fishery exporters shipped out nearly four times more high-iron foods than they imported. It is not surprising that those with alarming hunger indexes exhibit the greatest degree of nutritional unequal exchange and the lowest nutritional footprints. Despite alarming hunger indexes, Bangladesh, Cambodia, India, and Pakistan exported 4.1 times more high iron fishery commodities than they imported. The six fisheries ranked with serious hunger indexes exported 2.7 times more high iron fish than they imported while those ranked moderate shipped out 2.6 times more high iron foods than they acquired. With respect to high iron fishery commodities, it is clear that thirteen of the Asian fisheries are trading

TABLE 7 Nutritional unequal exchanges embodied in trade of Asian fishery commodities, 2016

Asian fishery	MG iron per exported ton	MG iron per imported ton	Percentage gain or (loss) of iron per imported ton	Grams protein per exported ton	Grams protein per imported ton	Percentage gain or (loss) of protein per imported ton
Part A. Lost both Iron and Protein						
A [a]Bangladesh	59,151	15,480	(73.8)	261,601	229,040	(12.5)
A [a]Cambodia	59,150	10,180	(82.8)	261,600	239,640	(8.4)
M China-Mainland	30,095	14,070	(53.2)	279,480	231,860	(17.1)
A [a]India	52,650	11,180	(78.8)	265,600	237,640	(10.5)
S [a]Indonesia	40,365	11,660	(71.1)	273,160	236,840	(13.3)
M Malaysia	35,035	13,980	(60.1)	276,440	232,040	(16.1)
S Myanmar	32,110	24,460	(23.8)	278,240	211,081	(24.1)
S [a]North Korea	73,385	17,380	(76.3)	252,840	225,240	(10.9)
A [a]Pakistan	23,010	10,054	(56.3)	283,840	239,892	(15.5)
S [a]Philippines	32,556	12,240	(62.4)	277,999	235,520	(15.3)
S [a]Sri Lanka	32,786	10,360	(68.4)	277,824	239,280	(13.9)
M Thailand	40,625	12,320	(69.7)	273,000	235,360	(13.8)
S Vietnam	32,955	13,840	(58.0)	277,720	232,320	(16.3)
Part B. Gained both Iron and Protein						
L China-Taiwan	18,922	39,388	108.2	182,245	223,999	22.9
L Japan	24,504	32,008	30.6	232,920	278,303	19.5
L South Korea	27,488	32,983	20.0	231,145	277,703	20.1

a low income food deficient country (FAO 2011a).

NOTES AND SOURCES: MT OF EXPORTS AND IMPORTS WERE AGGREGATED FROM GLOBAL FISHERY ND AQUACULTURE DATABASES, FAO (SEE TABLE 3), THEN CONVERTED TO GRAMS (1MILLION GRAMS PER MT). THE FIGIS DATABASE PROVIDES DETAILED INFORMATION ABOUT SPECIES THAT WERE TRADED. FOR NUTRITIONAL CONTENT OF FISHERY COMMODITIES, WE CONSULTED THE USDA FOOD COMPOSITION DATABASE. NUTRITIONAL VALUES WERE CALCULATED FOR 100 GRAM SERVINGS FOR EACH TRADED SPECIES. THE LETTERS BEFORE NAMES REFER TO THEIR 2010 GLOBAL HUNGER INDEXES (CONCERN WORLDWIDE 2010); A = ALARMING, S = SERIOUS, M = MODERATE, L = LOW

down nutritionally. On the world market, the foods that lead to a high nutritional footprint are higher value, reflecting the demand of rich countries. Consequently, the lower nutritional footprints result from the export of high value, nutrient rich foods coupled with the import of lower value, less nutritious higher calorie carbohydrates, sugars, and high fats (see Table 6). In sharp contrast, the three Asian fisheries with low hunger indexes (Japan, South Korea, Taiwan) imported 1.5 times more high iron fish than they exported, and 1.2 times more high protein foods than they lost. Overall, the low-hunger Asian fisheries are trading up nutritionally by importing from Asian neighbors with far worse hunger problems.

What do these numbers mean to individual Asians? When the unequal nutritional exchange is calculated as surpluses or deficits per capita, all these fisheries except Japan are made less food secure through trade. With their alarming hunger indexes, Bangladesh, India, and Pakistan lost about one kilogram per capita of high iron foods. Those judged to have serious hunger problems exhibited per capita deficits of 1.3 to 5.3 kilograms of high iron foods. Among those with a moderate hunger index, China lost nearly three kilograms of iron per capita while Thailand and Malaysia were shortchanged 37 to 47 kilograms per capita. In addition, thirteen of these fisheries experienced per capita protein shortfalls while another three barely met national consumption needs. China achieved a per capita protein surplus of nearly 41 kilograms, much of which was derived from dependency on imported soy that is being substituted for the more nutritious fishery commodities that the Chinese export.

The human benefit of unequal nutritional exchange is evidenced in the polarization between Japan, Taiwan and South Korea and their neighboring fishery exporters. While they receive high iron and high protein foods and fishery commodities from Asian neighbors whose exports sustain their *high nutritional footprint*, they export to them lower-quality canned fish and processed foods which exacerbate their *low nutritional footprints* that lack nutrient density.[18] In short, these three Asian fisheries eat more than an equitable share of the high iron and high protein commodities produced in this region while a high proportion of the residents of the fisheries that supply them have access to so little of these foods that they exhibit higher incidence of hunger and nutritional deficiencies.

18 Analysis of Japanese food exports and trading partners, UN COMTRADE database.

4.3 *Do Farm Outputs Offset Fishery Nutritional Shortfalls Caused by Exporting?*

In order to determine what foods the Asian fisheries need to import to overcome those nutritional shortfalls, we must examine their agricultural production patterns. When we sort crops into nutritional categories, we see that foods that are high in carbohydrates, sugars and fats account for one-half to three-quarters of crop production in all the Asian fisheries. Consequently, agricultural production does not alleviate the losses of iron and protein caused by fishery exporting (see Table 7). On the one hand, food crops account for a minority of total agricultural production (see Table 4). On the other hand, high iron/protein foods represent a minuscule amount of farm output. Pulses, chicken, meats, eggs, milk, nuts, mangoes and spinach were the only high iron/protein outputs they produced. Because they exhibit protein inadequacies and high incidence of iron deficiency anemia, fisheries with alarming or serious food indexes need to generate more of these nutrients through agricultural production. However, that is not occurring. High iron/protein foods accounted for less than one percent of agricultural production in Indonesia, North Korea, the Philippines, Sri Lanka, and Vietnam, compared to two to four percent in Bangladesh and Myanmar. Pakistan stood out as an anomaly, as it allocated 14 percent of agricultural output to these nutrients. Among the fisheries with moderate and low hunger indexes, high iron/protein foods accounted for less than one-tenth of one percent of agricultural production in Malaysia and Thailand, compared to four to seven percent in Japan and South Korea.[19]

Throughout the Asian fisheries, there is a *nutritional shift* to a high beef diet by middle class and elite households which is driving conversion of croplands to pastures for livestock production (Wilkinson 2010). This trend led us to question whether the nutritional impacts of fishery exports were offset by domestic meat production. On the one hand, none of these Asian fisheries is producing enough beef to feed its entire population, so red meat consumption is still a luxury food for the minority who can afford it. On the other hand, the populations of fourteen of the Asian fisheries experience a moderate to severe incidence of anemia that could be offset by access to affordable high iron fishery or beef outputs (see Table 8). On average in 2016, however, the ten Asian fisheries with a high to severe incidence of anemia exported 8.4 milligrams of fishery-iron per capita to every milligram of beef-iron generated domestically. With a moderate incidence of anemia, Malaysia and Thailand e4xported

19 Analysis of food crop outputs, FAO (2017a).

TABLE 8 Can domestic meat production offset iron losses from fishery exporting? 2016

Asian fishery	MG iron per capita in exported fishery products	MG iron per capita in domestic beef production (after wastage and exports are deducted)
Part A. Asian fisheries with severe incidence of iron deficiency anemia		
A Bangladesh	26.1	2.0
A [a]Cambodia	99.4	32.8
A [a]India	41.0	19.5
S [a]Indonesia	129.6	20.8
S Myanmar	194.4	141.0
Part B. Asian fisheries with high incidence of iron deficiency anemia		
S [a] North Korea	170.8	11.7
A [a]Pakistan	15.7	91.8
S [a]Philippines	81.9	28.4
S [a]Sri Lanka	28.0	10.6
S Vietnam	512.4	34.7
Part C. Asian fisheries with moderate incidence of iron deficiency anemia		
M China-Mainland	90.5	71.5
M Malaysia	283.4	12.6
L South Korea	263.9	43.4
M Thailand	807.1	15.0
Part D. Asian fisheries with mild incidence of iron deficiency anemia		
L China-Taiwan	548.5	1.7
L Japan	97.5	29.5

a low-income food-deficient countries (FAO 2011a). The letters before names indicate Global Hunger Indexes (Concern Worldwide 2010); A = alarming, S = serious, M = moderate, L = low.

SOURCE: COLUMN 1 WAS CALCULATED USING DATA IN TABLES 3 AND 5. MT OF MEAT WERE AGGREGATED FROM FAOSTAT, THEN WASTAGE AND EXPORTS WERE DEDUCTED. FOR PER CAPITA ANALYSES, THE MT AVAILABLE FOR DOMESTIC CONSUMPTION WERE CONVERTED TO MILLIGRAMS. NUTRITIONAL VALUES WERE CALCULATED FOR 100 GRAM SERVINGS. FOR NUTRITIONAL CONTENT OF MEATS AND FISH, WE CONSULTED THE USDA FOOD COMPOSITION DATABASE. INCIDENCE OF ANEMIA FROM TABLE 2

38 milligrams per capita of iron-rich fishery commodities to every milligram of domestic beef.

There are four exceptions to these trends, indicating more extensive reallocation of agricultural lands to cattle pasturage. With a high incidence of anemia, Pakistan produces 5.8 milligrams per capita of beef-iron to every exported milligram of fishery-iron. However, the country's anemia incidence would be lower if these meat outputs were actually accessible to the poor and much of the middle class. In this context, it is questionable that Pakistan should be exporting its high-iron fishery products. With a moderate incidence of anemia, China exports 1.3 fishery iron milligrams per capita to every milligram of domestic beef. Also exhibiting a moderate anemia incidence, South Korea exports 6.1 fishery-iron milligrams per capita to every domestic beef milligram. With a low incidence of anemia, Taiwan exports 322.6 milligrams of fishery-iron per capita and Japan exports 3.3 fishery-iron milligrams per capita to every milligram of domestic beef-iron. These trends are problematic for two reasons. First, they represent reallocation of farm lands to the production of livestock, limiting the acreage available for production of plant-based high iron/protein foods that are more affordable locally. Second, they indicate a shift toward the western pattern of consumption of less healthy red meats. Third, beef is so expensive in all the Asian fisheries that it is rarely eaten by a majority of the people. Consequently, anemia reaches into both poor and middle class households in the Asian fisheries, including Japan (see Table 2).

4.3 *Growing Dependency on Wheat, Soy and Processed Foods*

Analysts continue to assume that rice is the central staple of Asian diets, but this has not been a correct assessment for some time. In reality, rice now accounts for 20 percent less of Asian food consumption than it did in 1961 (see Figure 7). By 2010, rice accounted for 28 percent of total agricultural tons produced in Bangladesh and one-fifth of crop output in Myanmar. However, rice did not predominate in any of these fisheries. Indeed, rice accounted for only 5 to 11 percent of total agricultural output in India, Japan, Pakistan and South Korea, one to three 3 percent in China, Indonesia, North Korea, the Philippines, and Vietnam, and less than one percent in Malaysia, Thailand and Sri Lanka.[20] While national governments still define rice to be the staple for the poor, the growing Asian middle classes are diversifying their diets toward wheat (FAO 2013), as food importing trends reflect. In 2010, all the major Asian fishery exporters, except the Philippines, spent more of their food import

20 Aggregation and analysis of data in FAO (2010).

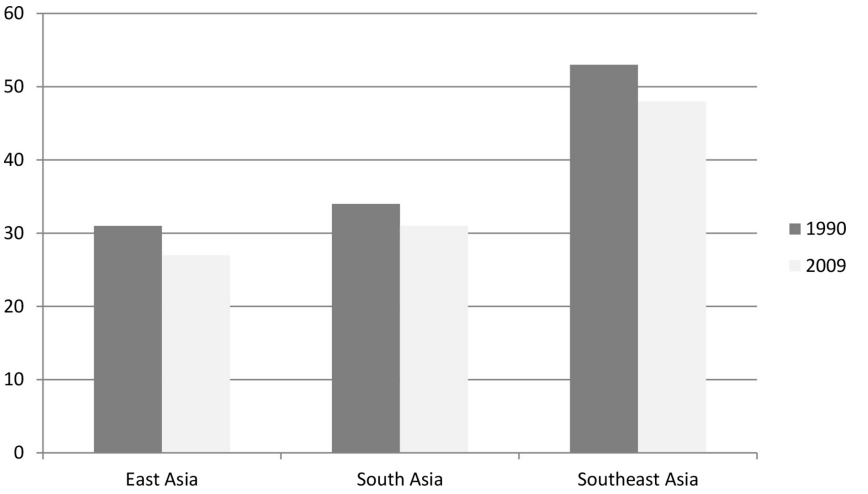


FIGURE 7 Percentage of rice in total food consumptions, 1990–2009
SOURCE: ADB (2012)

budgets on wheat than on rice. By 2013, however, even the Philippines was importing greater levels of wheat than rice. Indeed, China is now the only country that ranks among the world's top ten rice importers while the Philippines has slid down to 36th position.[21] Even though several of these fisheries (e.g., Bangladesh, the Philippines, Thailand, Vietnam) produce high levels of rice, they also import large quantities of wheat. Indonesia (1st), Japan (3rd), China (6th), South Korea (7th) rank among the world's top ten largest wheat importers. Even though China and India are now the first and second largest wheat producers in the world, neither country cultivates enough to meet national demand, so both rely on imports.[22]

Why is this trend toward dependency on wheat imports significant to the food security of the Asian fisheries? First, wheat is more expensive than rice, so it is not affordable for the poor. Moreover, it has been characterized by price volatility. Between 2002 and 2012, the price index for wheat rose more than the price index for all foods (FAOSTAT). Second, most of these Asian fisheries expend more of their food import budgets on wheat than on high iron/protein foods. India and China are able to expend a great deal more on proteins

21 Aggregation and analysis of imports, UN COMTRADE database.

22 Historically, these fisheries imported a great deal of their wheat from the USA, but this pattern has shifted over the last decade. By 2013, these fisheries were purchasing wheat primarily from Canada, Ukraine, Russia and Australia (Analysis of Asian wheat imports, UN COMTRADE database.)

because they produce much of their national wheat consumption. Thailand, Japan and South Korea expended more on proteins, but they exchanged high iron/protein fishery exports for wheat. Nine of the fisheries with alarming and serious hunger indexes expended more of their food import budgets on wheat than on proteins. Even though rice accounted for more than half of the total crop production in these two countries, low-income food-deficient Bangladesh spent 9.5 times more on wheat than proteins while Myanmar (with a serious hunger index) expended a minuscule amount on proteins compared to wheat (FAOSTAT). What all these fisheries have in common is that they are *trading down* nutritionally. They export high iron foods in order to acquire foods which have high caloric value but provide very low levels of important nutrients. In the case of wheat, they engage in a nutritional unequal exchange, i.e., high iron/protein foods and fishery commodities into the world market in exchange for a food that is primarily carbohydrate.

Asian traditional diets have not only shifted with respect to cereals but also in terms of growing dependency on soya imports as substitutes for protein/iron exports. China and India are the fourth and fifth largest producers of soya in the world, but they utilize their production nationally. Consequently, these Asian fisheries import most of their soya from the USA, South America and Canada.[23] In 2010, soybeans accounted for a majority of the protein imported by Indonesia, North Korea and China while Japan, Malaysia, South Korea, Thailand, and Vietnam utilized two-fifths to half of their protein expenditures on soya imports. About one-quarter of the protein imports of Bangladesh and Myanmar were soybeans while 12 percent of the protein imported by the Philippines was soya.

There are four problems with this pattern. First, prices of soya have risen as world demand has risen; soya cost three times more in 2012 than in 2002. Second, import of soy represents a nutritional unequal exchange of high iron exports for protein imports in fisheries that have high incidence of iron deficiency anemia (see Table 1). Third, these fisheries are substituting dependency on a single protein for production of traditional foods that supplied protein diversity. Fourth, western medical and nutrition experts have documented nutritional dangers of soy for three decades, even though soy is now a fad food around which all kinds of positive advertising claims are made. The soybean contains large quantities of natural toxins that block enzymes needed for protein digestion and iron absorption. Thus, individuals with iron deficiency or those at high risk of developing iron deficiency (which is a serious health

23 Five of the world's top ten soya producers are situated in South America: Brazil (2nd), Argentina (3rd), Paraguay (6th), Uruguay (8th) and Bolivia (10th).

problem in these Asian fisheries, especially for women and children) should avoid eating soy. Clearly, soya importing represents a nutritional unequal exchange because high iron exports are exchanged for a protein that has the capacity to lower iron absorption from the few sources that are still available to Asian consumers (Latunde-Dada and Neale 1986). To complicate matters, the processing of soybeans at high temperatures denature them so that much of the nutritional effect of their proteins is dissipated. In addition, soybeans have a much higher degree of contamination by pesticides than most foods (Morck et al. 1982).

There is another trend that indicates the disjuncture between national nutritional needs and food imports. Health and nutrition experts argue that food importing is popularizing globally the worst nutritional habits of westerners, leading toward a rising incidence of lifestyle diseases that once characterized only a few rich countries. Many of the emerging Asian nutritional and health problems are related to the displacement of local fresh fish, vegetables and fruits by imported processed foods that are loaded with high levels of carbohydrates, fats, and sugars (Goryakinab et al. 2015). On average, Asian fisheries with alarming and severe hunger indexes imported 2.5 times more tons of less nutritious processed commodities than high iron/protein foods. With the exception of Malaysia, the fisheries with moderate and low hunger indexes exhibited the opposite pattern. On average, they imported 2.5 tons of high iron/protein foods to every ton of processed foods. However, all the Asian fisheries exchanged fishery products for processed foods. Specifically, these fisheries exported fresh/frozen fish and shellfish of higher nutritional and market value, but they imported fish preparations with carbohydrate and fat fillers and canned fish species of lower nutritional and market value. Indeed, 39 percent of the imports of fish by these Asian fisheries originate from the processing and re-export of their exports by developed countries (FAO 2012b: 41, 70). Philippine scholar Renato Constantino (1988) called attention to this nutritional unequal exchange three decades ago. *Protein imperialism* results, he argued, from international trade in which richer countries export their high-fat, high-sugar, low-protein foods to poor countries from which they import more nutritious proteins. Moreover, processed foods are linked to the rising obesity among the poor and middle classes in the Asian fisheries (Ng et al. 2014).

4.4 *Imported Production Inputs for Export Commodities*

These nutritional unequal exchanges are exacerbated by another import pattern. To support their production of crops and fish for export, all the Asian fisheries import fossil fuels, agricultural machinery, boats and tools, animal

and aquaculture feeds, fertilizers, pesticides, and live species for propagation. North Korea spends nearly as much on these inputs as it receives for its food exports, while China expends three-fifths of the value of its food exports on imported inputs. India, Vietnam and Thailand lose about one-quarter of the value of food exports in this manner while Indonesia, Malaysia, Myanmar and Sri Lanka allocate 15 to 20 percent of the value of food exports to cover these costs.[24] Rather than purchasing high iron/protein foods, Asian fisheries with severe nutritional shortfalls utilize import dollars to acquire inputs to produce exports. In other words, pesticides for exports are prioritized over domestic consumption. The situation of Bangladesh underscores this dilemma. This low-income food-deficient country expends nearly twice as much on imported production inputs as it receives for its food exports. The Asian fisheries make another import choice that has food security implications. On average, the low-income food-deficient fisheries expend $7.80 on petroleum to every dollar utilized for food imports. For instance, India's food imports cost only 13 percent of what the country pays out for petroleum.[25]

Table 9 makes clear the nutritional impacts of the food versus feed import choices by the Asian fisheries. In 2016, imports per capita of high iron foods exceeded per capita feed imports in only five of the fisheries. In those countries, however, imports of aquaculture feeds– primarily to produce shellfish exports– cost $1.95 to every dollar's worth of high iron fish imports for humans. This is why fishers in the Philippines, India and Bangladesh report that fishponds are more nutritious than their household diets (Environmental Justice Foundation 2003). The ten fisheries with high or severe incidence of anemia expended $1.41 per capita of feeds for livestock and fishponds to every import dollar for high iron foods. The four fisheries with moderate incidence of anemia imported $1.16 per capita in feed to every dollar per capita of imported high iron foods. Import patterns help to explain why Japan and Taiwan are the only two Asian fisheries with a mild incidence of anemia. While Japan allocates 1.3 times more per capita to import feeds, Taiwan nearly breaks even in its feed/food imports. It is in the import of high iron fish that Japan and Taiwan stand out from the other fisheries. Japan spent $3.96 on imported high iron fish to every aquaculture feed dollar while Taiwan utilizes only 44 cents for feed imports to every dollar of high iron fish imports. Japan and Taiwan achieve their high iron food imports through nutritional unequal exchanges with hungrier neighboring fisheries (see Table 5). With a moderate incidence of anemia, China spends $8.90 on imported aquaculture feeds to

24 Aggregation and analysis of import data, UN COMTRADE database.

25 Aggregation and analysis of import data, UN COMTRADE database.

TABLE 9 Food versus feed in the import budget, 2016

Part A. Asian fisheries in which feed imports exceed high-iron food imports

Asian fishery	Incidence of anemia	Thousand $US spent on high iron human foods (excludes fish)	Thousand $US spent on high iron fish imports for humans	Total thousand $US spent on foods & fish for humans	Thousand $US spent on livestock feeds	Thousand $US spent on fish feeds	Total thousand $US spent on livestock & fish feeds	$US spent per capita on high iron foods	$US spent per capita on feeds
[a]Cambodia	Severe	67,514	1,449	68,963	129,845	3,976	133,821	4.36	8.46
China-Mainland	Moderate	13,805,343	515,552	14,320,895	25,679,914	4,585,575	30,265,489	10.54	22.27
China-Taiwan	Mild	1,710,173	1,090,976	2,801,149	2,419,197	480,062	2,899,259	118.91	123.08
[a]Indonesia	Severe	3,286,338	82,273	3,368,611	4,025,444	208,529	4,233,973	12.93	16.25
Japan	Mild	2,569,624	5,146,965	7,716,589	8,983,298	1,299,079	10,282,377	61.08	81.40
Malaysia	Moderate	981,354	307,599	1,288,953	2,298,941	258,911	2,557,852	41.91	83.18
[a]North Korea	High	80,279	30,453	110,372	262,271	47,228	309,499	4.36	12.24
[a]Pakistan	High	336,076	63	336,139	541,006	33,373	574,379	1.74	29.79
South Korea	Moderate	3,275,215	1,986,003	5,261,218	5,676,502	706,351	6,382,853	104.17	126.38
Thailand	Moderate	1,511,133	612,040	2,123,173	2,920,079	21,024	2,941,103	31.15	43.16
Vietnam	High	1,585,225	482,502	2,067,727	6,209,570	223,129	6,432,699	21.89	68.11

TABLE 9 Food versus feed in the import budget, 2016 (***Cont.***)

Asian fishery	Incidence of anemia	Thousand $US spent on high iron human foods (excludes fish)	Thousand $US spent on high iron fish imports for humans	Total thousand $US spent on foods & fish for humans	Thousand $US spent on livestock feeds	Thousand $US spent on fish feeds	Total thousand $US spent on livestock & fish feeds	$US spent per capita on high iron foods	$US spent per capita on feeds
Part B. Asian fisheries in which total high-iron food imports exceed total feed imports but fish feed exceeds human fish imports									
[a]Bangladesh	Severe	1,370,769	60,297	1,431,066	884,700	89,004	973,704	8.78	5.80
[a]India	Severe	2,257,772	17,523	2,275,295	543,976	43,840	587,816	1.71	0.44
Myanmar	Severe	234,080	8,738	242,817	178,833	10,782	189,615	4.47	3.49
[a]Philippines	High	1,529,041	56,939	1,585,980	401,006	121,092	522,098	15.51	5.11
[a]Sri Lanka	High	759,731	2,985	762,716	163,377	21,024	184,401	36.65	8.86

a low income food deficit countries (FAO 2011a).

SOURCES AND NOTES: ANALYSIS OF DATA AGGREGATED FROM GLOBAL FISHERY AND AQUACULTURE DATABASES, FAO AND FAOSTAT DATABASES. INCIDENCE OF ANEMIA FROM TABLE 2

every dollar utilized to import high iron fish for human consumption. China acquires those aquaculture feeds by importing small fish from neighboring hungrier fisheries that should utilize those exports as human high protein foods.

4.5 *Impacts of Food Imports on Agricultural Production*

As Figure 8 shows, food imports expanded dramatically in the Asian fisheries between 2001 and 2011. Imports more than quadrupled for countries with alarming hunger indexes while those with serious hunger indexes more than doubled their imports over this decade. What have been the impacts of these rising imports? First, we know from the data about undernutrition that food imports have not offset nutritional shortfalls (see Table 9). Second, food importing has had the effect of dampening Asian agricultural production. The Food and Agriculture Organization (2003c) points out that "high import growth can undermine otherwise viable domestic production." Since 2000, public spending on agricultural and fishery research and extension systems has stagnated in the Asian fisheries, except China and India (ADB 2013). According to Chang and Shih-Hsun (2011: 10),

> agriculture is increasingly neglected in most Asian countries. In Japan, agriculture is in a freefall decline. In the years between 1960 and 2005, the share of agricultural output in GDP dropped from 9% to 1%, the food selfsufficiency ratio from 79% to 41%, and agricultural land, indispensable for food security, from 6.09 million hectares to 4.63 million hectares. Meanwhile, the ratio of parttime farm households, which derive more than half their income from nonfarm employment, increased from 32.1% to 61.7%. The percentage of farmers over 65 years old also jumped from 10% to 60%. Gross agricultural output in 2006 was 8.5 trillion yen, less than the sales volume of Panasonic.

For instance, South Korea has opted to prioritize its urbanized industries, showing little interest in agriculture. It now imports a majority of its food, making it very difficult for farmers to earn livelihoods. Its urban centers are symbols of 'sparkling Korea' while poverty characterizes the countryside. Since the average farmer is older than fifty and tills a few hectares, the farm sector is stigmatized by most Koreans as backward (Müller 2011).

Though the populations and labor forces of most of the Asian fisheries are still disproportionately rural, they have shown sharp declines in food self-reliance, and the share of the GDP represented by agriculture has shrunk. All

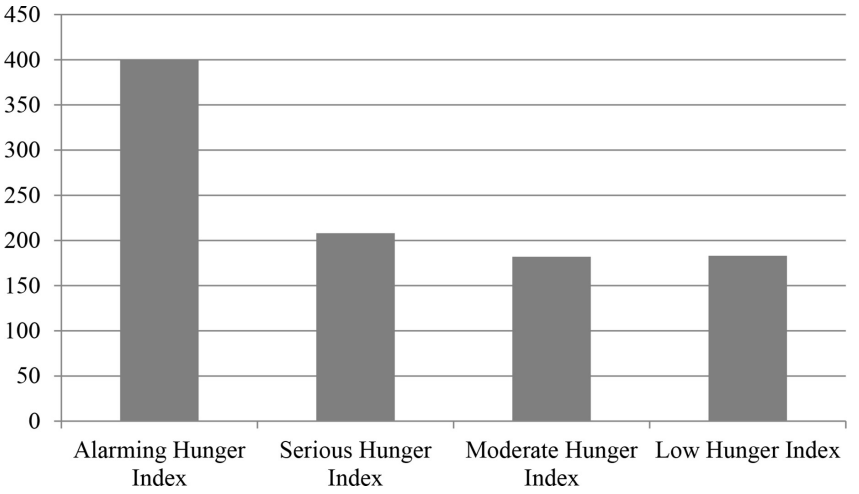


FIGURE 8 Percentage increase in $US value of food imports in the major Asian fisheries, grouped by global hunger index, 2001–2011
SOURCES AND NOTES: THE VALUE OF ALL CATEGORIES OF FOOD IMPORTS WERE AGGREGATED FOR 2001 AND 2011 FROM UN COMTRADE DATABASE, THEN PERCENTAGE OF GROWTH WAS CALCULATED BETWEEN THESE TWO YEARS. GLOBAL HUNGER INDEXES FROM CONCERN WORLDWIDE (2011)

the Asian fisheries have undergone a deterioration in agricultural self-reliance since implementation of the 1995 WTO Agreement on Agriculture.[26]

> The deterioration is a reflection of the much higher growth in food imports ... because domestic production cannot compete with cheap imports. ... Small producers incur large income losses (relative to the retail prices they received in the past) while traders and firms have reaped significant benefits. The impact of the constantly diminishing share of total income accruing to these small producers has been devastating in terms of social dislocation, reduced entitlements, and poverty as well as food insecurity. (GuhaKhasnobis et al. 2007: 282–89)

Imported production inputs for export crops and aquaculture have also impacted small producers negatively.

26 For impacts on China's rural communities, see Song and Chen (2006).

5 Nonfoods and Asian Food Security

Nonfood agricultural and fishery exports pose serious threats to Asian food security in two ways: (a) use of farmlands to cultivate nonfood export crops and (b) conversion of foods into nonfood uses. The major Asian fishery exporters utilize a growing share of their agricultural lands to cultivate nonfood crops for export, limiting the ecological resources that are left to be used for the production of foods for domestic consumption. All these Asian fisheries produce thousands more tons of nonfoods than of foods that are rich in iron and protein (see Table 4). In addition to feed grain exporting, the *nutritional shift* to a high animal protein diet by Asian middle classes is driving greater allocation of farm lands to cultivate feed grain (Wilkinson 2010). Since 2000, at least 11 percent of Asian food croplands have been reallocated to nonfoods, including biofuels (Elder and Hayashi 2018). To permit agricultural diversification towards high-value commodities for export, rice and vegetable fields are increasingly being displaced by floriculture, rubber and palm oil production (FAO 2011b; Gray 2008; Ziegler, Fox and Xu 2009). These Asian fisheries produce 82 percent of the world's rubber, 62 percent of tobacco, 53 percent of cotton (FAO 2010) and more than 90 percent of jute and similar fibers (FAO 2009b). Increasingly, Indonesia and Malaysia are prioritizing palm oil production over food crops (Gellert 2015). In addition, these fisheries generate two edible, noncaloric nonfoods, i.e., more than half the world's tea and one-quarter of coffee (FAO 2010). To cultivate floricultural exports (primarily cut flowers and potted houseplants), three-quarters of the world's lands, nearly one million hectares, are concentrated in Bangladesh, India, the Philippines, Sri Lanka, Vietnam, China, Thailand and South Korea.[27]

As a result of this prioritization of nonfood exports, food crops account for a minority of total agricultural production. On average, nearly 62 percent of the total agricultural production of the countries with alarming hunger indexes is allocated to nonfoods while nonfoods account for nearly 84 percent of agricultural outputs of the countries with serious hunger indexes. Alarmingly, nonfoods comprise 95 percent or more of crop outputs in Sri Lanka, Vietnam, Malaysia and Thailand. Even in Japan, foods account for less than one-quarter of total agricultural output. Pakistan is the only Asian fishery that generates more food than nonfood crops. It is likely that food production is even lower for these countries than Table 4 makes it appear. On the one hand, official agricultural statistics do not report all nonfood crops. For instance, India is using

27 Aggregation and analysis of country data in FAO (2010, 2011b).

TABLE 10 Nonfood production, 2016

Fishery territory	Total MT agricultural production	MT nonfood crops (% total)	Nonfoods produced	Foods converted to nonfoods for export
A [a]Bangladesh	176,180	105,629 (60.0)	Tea, Rubber, Tobacco, Jute, Floricultural	
A [a]India	2,832,574	1,939,976 (68.5)	Tea, Coffee, Rubber, Tobacco, Jute, Cotton, Cottonseed, Floricultural	Fish, Seaweed
A [a]Pakistan	264,181	119,582 (45.3)	Cottonseed, Rubber	Fish, Coconut Oil
S [a]Indonesia	4,873,900	3,651,544 (74.9)	Rubber, Tobacco, Coffee, Tea, Jute	Fish, Coconut Oil, Palm Oil, Seaweed
S Myanmar	173,806	111,805 (64.3)	Rubber, Tobacco, Coffee, Tea, Cotton, Jute	Coconut Oil
S [a]North Korea	75,176	63,000 (83.8)	Tobacco, Rubber, Tea, Coffee	Fish, Seaweed
S [a]Philippines	585,569	519,866 (88.7)	Tobacco, Rubber, Coffee, Floricultural	Fish, Coconut Oil, Palm Oil, Seaweed
S [a]Sri Lanka	459,589	434,636 (94.6)	Tobacco, Rubber, Coffee, Floricultural	Coconut Oil, Palm Oil, Seaweed
S Vietnam	1,956,988	1,867,512 (95.4)	Tobacco, Rubber, Tea, Coffee, Floricultural, Jute	Fish, Coconut Oil, Palm Oil, Seaweed
M China-Mainland	6,386,474	4,911,974 (76.9)	Tobacco, Rubber, Tea, Coffee, Floricultural, Jute, Cotton	Fish, Coconut Oil, Palm Oil, Seaweed
M Malaysia	953,300	908,829 (95.3)	Tobacco, Rubber, Tea, Coffee	Fish, Coconut Oil, Palm Oil

TABLE 10 Nonfood production, 2016 (*Cont.*)

Fishery territory	Total MT agricultural production	MT nonfood crops (% total)	Nonfoods produced	Foods converted to nonfoods for export
M Thailand	3,294,636	3,274,786 (99.4)	Tobacco, Rubber, Tea, Coffee, Jute, Floricultural	Fish, Coconut Oil, Palm Oil, Seaweed
L Japan	170,783	122,600 (71.8)	Tea, Tobacco	Fish, Seaweed
L South Korea	65,244	37,050 (56.8)	Floricultural	Fish, Seaweed

a low-income food-deficient country (FAO 2011a). The letters before names indicate Global Hunger Indexes (Concern Worldwide 2010); A = alarming, S = serious, M = moderate, L = low. Data not available for Cambodia and Taiwan.

SOURCE: ANALYSIS OF DATA AGGREGATED FROM FAOSTAT AND GLOBAL FISHERY AND AQUACULTURE DATABASES, FAO, DATABASES. TEA AND COFFEE ARE CLASSIFIED AS NONFOODS BECAUSE THEY HAVE NO CALORIC VALUE

vast areas for jatropha plantations to produce diesel, but this production is not reported in international data (Aziza-Montobbio et al. 2010). On the other hand, it is not possible to disaggregate official statistics so as to separate out the large number of hectares used for production of foods that are being redirected to nonfood uses, especially corn, coconuts and palm oil.

There is a second way in which nonfoods pose serious threats to food security. As part of the unequal nutritional exchange, these Asian fisheries reallocate foods from their domestic human food chains to export them for nonfood uses in richer countries. For instance, they have trapped themselves in what Yotopoulos (1982) terms the *food versus feed* dilemma. The modern food-feed competition entails an international division of labor in which developing countries produce animal feeds for the richer segment of the world.

> Starchy food grains, which double as feed grains, are transformed into costly animal products, resulting in less energy and protein than was contained in the original feed. A kilogram of beef provides 1,140 calories of energy and 226 grams of protein, but the feed grain for producing that kilogram of feed, if directly consumed as food grain ... provides as much as 24,150 calories and 700 grams of protein. Demand for costly animal

> products is heavily concentrated among the well-to-do who thereby draw away grain for use as feed for animals, reducing direct consumption as food for the poor both at a global level and within a given developing country. (Patnaik 2010: 86–87)

In these Asian fisheries, more than half of cereals and 83 percent of coarse grains (barley, oats, rye, sorghum) are diverted into feeds (Chand 2008; FAO 2013a). Throughout Asia, cassava is the third most important source of calories in the human food chain. While production of this tuber has expanded 3 percent annually since the 1970s, much of this output has been exported to be used in livestock and poultry feeds globally (Prakash 2010).

In 2010, these Asian fisheries produced nearly 89 percent of the world's supply of palm oil and 88 percent of the coconut oil, exporting most of it to be used for biofuels and industrial purposes.[28] While they supply nearly 90 percent of the world's exports of these two oils, they import (mostly from the US and Europe) nearly one-fifth of the world's traded edible oils, in an attempt to meet the domestic shortfall of this type of food. The Food and Agriculture Organization (2008a) points to negative impacts of biofuels on world food security, especially for countries that divert domestically consumed foods to nonfood exports. These Asian fisheries are diverting palm oil, coconut oil, and corn into exports to be processed into biofuels (Chand 2008). In Vietnam, the oil of some fishery species is used for biodiesel (Philippine Annual Fisheries Profile 2007).

Even in the face of national shortfalls of seafoods, these Asian fisheries divert outputs into nonfood uses. Indeed, they export nearly 17 percent of their fishery production as nonfoods, such as aquarium specimens, fish meal to be used in livestock and aquaculture feeds, pet foods or fertilizers. In addition, sea plants are removed from local food chains to be exported for industrial and nonfood uses in richer countries. In 2012, China, India, Indonesia, Japan, Malaysia, North Korea, the Philippines, South Korea, Thailand and Vietnam ranked among the world's top 30 cultivators and exporters of seaweed derivatives. Though a low-value commodity in international markets, seaweed is rich in several nutrients. One cup of seaweed provides 150.4 milligrams of Omega3 fatty acids and nearly 20 grams of protein. It is also a good source of vitamin A, vitamin C, vitamin E, vitamin K, niacin, pantothenic acid and phosphorus, and a very strong source of riboflavin, folate, calcium, iron, magnesium, copper and manganese. However, it has been extracted from traditional Asian diets

28 Coconuts could be used domestically to meet protein shortfalls.

to become a significant input into commodities produced by rich countries. Seaweed enters the global market in the form of carrageenan, a substance that is used as an additive in many processed foods and for numerous nonfood industrial purposes (SIAP 1996).

6 Will Aquaculture Solve Asian Protein and Iron Shortfalls?

The success of aquaculture is that it has vastly expanded world output of fish and marine foods. The failure and the dilemma of aquaculture, however, is that it has integrated fish and marine resources into global commodity chains, threatening the food security of Southern exporters. Despite all its purported advantages, the Blue Revolution is really *food imperialism* (Yoshinori 1987). Export-oriented aquaculture has concentrated control over the world's fish and marine foods into the hands of a few multinational corporations. Rather than eradicating hunger or expanding resources to feed Southern populations, aquaculture has further polarized world food distribution and consumption. Thus, it is highly unlikely that fish farming will insure food security for Southern nations because aquaculture outputs are driven by distant buyer demands, not by the goal of ending hunger in the producing fisheries (McMichael 1998). Despite their own domestic malnutrition problems, many low-income food-deficient countries prioritize the export of seafoods that are central to local consumption (FAO 2012b). On the one hand, industrial aquaculture re-orients local ecological resources from domestic production and monopolizes them to the point that small fishers can no longer generate their livelihoods in those ecosystems. On the other hand, developing countries employ their fishponds, fish cages and pens, and mariculture projects to maximize outputs of export species that are the latest food fads or industrial additives in richer countries.

Because of the global demand for consumption of a range of exotic species, developing countries expended significant amounts in research and development to improve the fishpond yields of those export crops in the 1990s (FAO 1995). For example, technological advances in breeding and nutrition, investment and financial incentives, and rising market demand in the United States, Japan and Europe contributed to the explosive 1990s boom in the Asian shrimp industry (Skladany and Harris 1995). By 2004, shrimp was the primary global aquaculture commodity, accounting for 18 percent of the total value of internationally traded fishery products (FAO 2007). Since 1990, Japan and China have been the two most influential countries in the development of the global aquaculture industry. In most decades since 1975, they have invested more in export-oriented fisheries of Asian and African countries than either the World

Bank or the Asian Development Bank. In the fisheries that export those seafoods, however, three-fifths or more of the population can no longer afford to eat these commodities. Even though the World Bank and the IMF advocate shellfish farming as a solution to food security in the Global South, shrimp contributes little to the nutritional needs of the world's malnourished people because it is primarily marketed as a luxury item that is consumed mainly by the rich in the developed world (Shiva 2000: 43).

Furthermore, agro-industrial fisheries consume more resources than they produce, further threatening food security. In Asia, aquaculture systems require three units of wild fish to every unit of food they produce, generating a net protein loss (Naylor et al. 2001). Moreover, one-quarter of aquaculture production never enters human food chains because it is absorbed as feeds for fish farming or grown as the hatchlings for future crops (CGIAR 1995). Massive amounts of smaller fish and shellfish are fed to carnivorous export species, leaving less natural protein for domestic consumers, especially the rural poor (FAO 2004a; Toufique 2015: 98).

To complicate matters, Asian aquaculture is not sustainable because it is an extractive industry that booms only so long as ecological resources are available and market prices are stable (European Commission 2002). Fish farming projects bust once environmental degradation threatens the supply base or when new competitive producers drive down global prices. According to Harriet Friedmann (2000: 480),

> Mobility of capital and labor, global sourcing and marketing, all disrupt the living and material cycles of local ecosystems and then attempt to compensate for the disruptions through more technology, more purchase of inputs, more selling or using of wastes. ... Over time, capital movements and markets eliminate the remaining wild places surrounding ecosystems. Thus, ecosystems are relinked through the very social institutions– market and transnational corporations– that disrupt them. Market and industrial techniques are called upon to find ever larger solutions, yet the only place that substances (and models) can be found is in the very earthly cycles needing repair.

Most of the Asian fisheries developed shrimp aquaculture in the 1980s and 1990s but faced serious ecological and economic problems with shellfish farming by 2000 (Mulekom et al. 2006: 551–54). We will explore this boom to bust cycle in Philippine shrimp farming in Chapters 2 to 4.

Because they accumulate feeds, chemicals and waste, fishponds generate unsanitary conditions that cause fishkills and dump high levels of pollution into rivers, coastal waters and farmlands. Unprofitable after five to ten

years of intensive farming, fishponds leave behind land and waterways that will be unproductive for several centuries (Skladany and Harris 1995; McGinn 2002). Moreover, agro-industrial aquaculture is capital-intensive, requiring the import of new production technologies and competitive species about every eight to ten years (Skladany and Harris 1995; FAO 2008c). Because exporters must repeatedly innovate to keep up with world market fads, they are pressured to import genetically modified species, feeds, chemicals and technologies (Lebel et al. 2002; FAO 2008d). While ecological degradation and changing world consumption fads account for the bust cycle in fishponds, competition from synthetics and from alternative agricultural commodities (such as corn starch) are much more likely to trigger bust cycles in sea plant exports, such as seaweed (*Japan Times* 2020). In short, no aquaculture export commodity booms very long in the world market, and it will diminish or destroy natural resources within a decade.

7 Food Security and Pressures toward Depeasantization

Pressures toward Asian depeasantization began in the 1980s with imposition of neoliberal structural adjustment programs that were designed to force indebted Southern countries to integrate their natural resources and their agricultural laborers into the world food trading system (SAPRIN 2002). According to Baviera and Bello (2009: 8), "the right hook of structural adjustment was followed by the left hook of trade liberalization in the context of unequal global trading rules." By pushing for defunding of government programs, World Bank and IMF policies eroded the productive capacity of peasant agriculture. Early in the 21st century, the World Bank (2018: 138) pointed to the negative impacts of integration of peasant agriculture into the world food system.

> Structural adjustment in the 1980s dismantled the elaborate system of public agencies that provided farmers with access to land, credit, insurance inputs, and co-operative organizations. The expectation was that removing the state would free the market for private actors to take over these functions– reducing their costs, improving their quality, and eliminating their regressive bias. Too often, that didn't happen. ... The private sector emerged only slowly and partially– mainly serving commercial farmers but leaving smallholders exposed to extensive market failures, high transaction costs and risks, and service gaps. Incomplete market and institutional gaps imposed huge costs in foregone growth and welfare losses for smallholders, threatening their competitiveness and, in many cases their survival.

To complicate matters, structural adjustment plans mandated the prioritization of "globally high-value" export crops and fishery species (SAPRIN 2002).

In the 21st century, those small Asian farmers and fishers who do not contribute targeted cash crops to export agendas are treated by their own governments like "historical remnants destined to disappear" (Mies and Shiva 2001: 235). In short, agriculture and fisheries are *de-localized* and production is standardized into a narrow menu of commodities that are in demand globally. In reality, world agriculture has become a transnationalized space in which the control of peasant farmers and fishers over production and distribution is minimized (McMichael 2005: 275–81). Moreover, the global food system disconnects production from consumption and delinks farmers from local markets where they have traditionally disposed of their surpluses. Instead, distant consumer demands for foods determine *material relations of food production*, diminishing the capacity of peasant farmers and fishers to effect fair prices for their outputs (Friedmann 2000). In Global South communities, *accumulation by dispossession* (Harvey 2003) operates through structural adjustment strategies to privatize ecological assets and to displace peasant agriculture. Following the restructuring of farm land and fisheries for export, independent farming and fishing are replaced by contract arrangements instituted by traders and agribusinesses, further exacerbating the vulnerabilities of small producers. "Contract farmers bear all the risks related to production and become extremely dependent on demand from the world market" (Delforge 2004: 1). Subsequently, local provisioning is weakened by increased food and fish importing (McMichael 2005: 266).

7.1 *Land and Waterway Dispossession*

Two of the worst impacts of globalized aquaculture are the dispossession of peasants from their lands and the destruction of traditional livelihoods (Harvey 2003). Throughout the Asian fisheries, the export orientation of fisheries and aquaculture has led to the marginalization of communities that had traditionally been involved in fishing and fish processing (Kurien 2002). A key factor in globalization of fishpond production has been privatization of commons. The first step in this process has been a re-definition of public ecosystems as being "available for development" because they are "idle waste lands that are unproductive." Following this rationale, governments have transformed hundreds of thousands of public coastal areas into single-purpose private property (Skladany and Harris 1995: 182). Loss of access to these natural resources has threatened the survival of peasant fishers in every Southern country that specializes in export aquaculture (Shiva 2000). Moreover, aquaculture has destroyed small-scale farms and enterprises to pave the way for

corporate-owned agribusiness enclaves (Bailey and Skladany 1991). In the global shrimp chain, for instance, small-scale traditional ponds have been aggregated to form larger, export-oriented farms. By controlling land and waterways and by relying on contract farming, larger aquaculture firms vertically integrate activities from production to post-harvest to marketing (Skladany and Harris 1995: 181). Even though peasants comprise a majority of the fishers located in areas where commercial aquaculture is entrenched, these households are marginalized from these economic activities (Bailey 1988b: 36). On the one hand, large aquaculture operations require high capital investments that small entrepreneurs cannot provide (Primavera 1991). On the other hand, large projects monopolize the credit offered by banks and financial institutions (Shiva 2002).

Furthermore, export aquaculture has led to the elimination of employment opportunities for Southern coastal populations. Despite the expensive inputs, export-oriented aquaculture employs far fewer laborers than do small-scale fishing operations. The net result has been that unemployment has risen among fishing households in the Global South that have converted to Blue Revolution production strategies (Shiva 2002). Moreover, few workers are required for the aquaculture systems, and child laborers are often exploited (Bailey and Skladany 1991). Worse, corporate shrimp farming has been tied to murders of peasant fisher-activists in eleven Asian and Latin American countries, including the Philippines (Environmental Justice Foundation 2003: 26).

8 Ecological Degradation of Asian Fisheries and Food Insecurity

More than one-third of global carbon and greenhouse gas emissions are generated by the production, processing and packaging for the world food system, and a majority of those emissions come from agriculture (Crippa et al. 2021a). The ecological costs of food extraction for export have been externalized to Asian fisheries for decades. Export-oriented agriculture is grounded in the systematic externalization of costs to the local environment to maintain productivity that will be consumed by distant consumers. According to Marcus Taylor (2014: 193–94),

> Industrial agriculture externalises costs to boost yields in two ways. First, it undercuts the ecological underpinnings needed to produce food– water, soil formation, biodiversity– through excessive use. Second, it is predicated upon the production of side effects– from groundwater contamination, pollution of surface water and greenhouse emissions– that undermine the capacity to generate future yields. Indeed, this model of agriculture

> deepens the very problems that it argues it is responding to. It is fossil-fuel intensive, produces significant methane emissions from industrial livestock production and nitrous oxide emissions from fertiliser application and promotes major land-use changes through deforestation. In short, modern industrial agriculture appears efficient if we willfully ignore the externalisation of costs that are displaced outward across space and time.

The more developed, less hungry countries to which most of the Asian fisheries export their food and fishery resources benefit from the *ghost acres* of land and waterways that are embodied in the exported commodities (Borgstrom 1967). Those exports create "phantom carrying capacity" for the importing countries, leaving behind resource depletion and ecological damage (Koellner and Sleen 2011). For example, the European Union (EU) has one of the highest land and fishery footprints in the world. Nearly 60 percent of the land the EU needs to meet demands for agricultural and fishery products derives from developing countries. While European Union land consumption is 1.3 hectares per capita, the Asian fisheries from which it imports foods average less than 0.4 hectares per capita (Friends of the Earth 2011). Similarly , Japan, China, South Korea and Taiwan acquire ghost acres that are embodied in crop and fishery imports from their less hungry neighbors (see Table 5). At the same time that the Asian fisheries are losing so many ghost acres through food and fishery exporting, the arable land available for crop production is rapidly shrinking (see Figure 9).

Defined in terms of the area of biologically productive land and water needed for production and waste assimilation, the *ecological footprints* of all the Asian fisheries, except Cambodia, exceeded their natural biocapacities in 2020 (see Figure 10). The ecological footprint of ocean fishing "is much larger than those of other forms of food production, even though capture fisheries supply only 1.2 percent of global caloric for human food consumption. More than half of the world's oceans are subject to industrialscale harvest, spanning an area four times that covered by terrestrial agriculture" (Kroodsana et al. 2018: 906). By the mid-1990s, a third of the world's oceans and two-thirds of continental shelves (primarily where small-scale fishing occurs) had an ecological footprint of 1.10. There is a startling contrast between the resource exploitation rates of agriculture and fishing.

> Doubling of world agricultural production from 1961 to 1995 was accompanied by an increase of only 10% of the surface under cultivation. Over the same period, marine fisheries, which underwent a comparable 2.4 fold increase in catch ... required a nearly 4fold increase in exploited area. (Swartz et al. 2010)

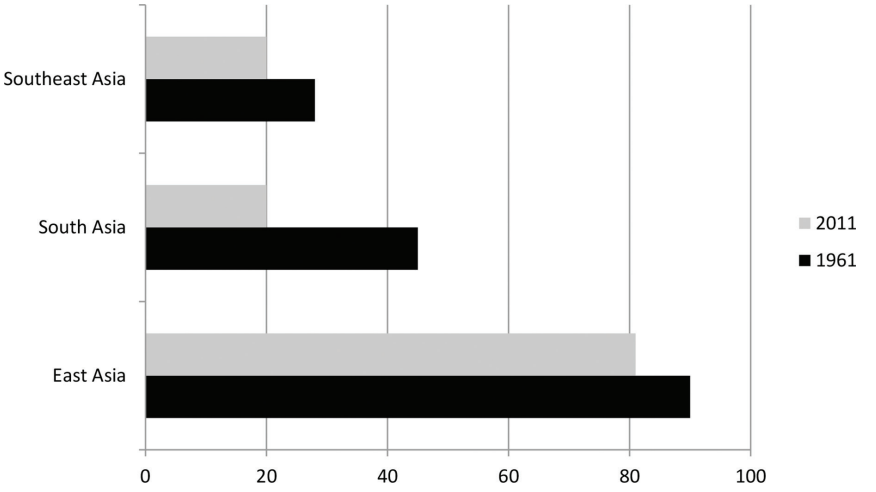


FIGURE 9 Hectares per capita of arable land, 1961–2011
SOURCE: ADB (2013: 41)

What is the ecological state of the Asian fisheries as a result of their exporting and overextension of natural resources? By 2009, 20 percent of the world's fishstocks had crashed, 40 percent were over-exploited, and 35 percent were fully exploited (Eggert and Greaker 2009: 2). In 2010, only about 11 percent of world fishstocks were not being fully exploited (FAO 2012b: 58). Nineteen of the world's 23 commercial tuna fisheries are depleted, endangered or vulnerable to extinction; another nine are fully fished (FAO 2006b). Many of these fishing grounds are located in the oceans and the continental shelves that surround the Asian fisheries. As we move into the 21st century, the ecological crises of Asian fisheries will further threaten regional food security. Because of their high production and export levels, Asian countries have been harder hit environmentally than the global averages. Consequently, Asian fisheries are 60 percent or more over-fished, with many species facing extinction (Hersoug 2004: 21). In addition to stress on coastal waters, overfishing is rampant throughout South Asian near-shore and inland waters. Many freshwater species have been depleted or are extinct, and rivers have been severely degraded (Pomeroy 2012). Moreover, Asian fishery-dependent communities are more vulnerable to the damage caused by climate change (Selvaraju et al. 2011). By 2012, the epicenter of the world fisheries crisis had shifted to the Asian fisheries (Suh and Pomeroy 2020).

Climate change is having significant impacts on the Asian fisheries, as we explore more fully in Chapter 7. Climate variability and change are modifying the migration patterns and productivity of marine and freshwater aquatic

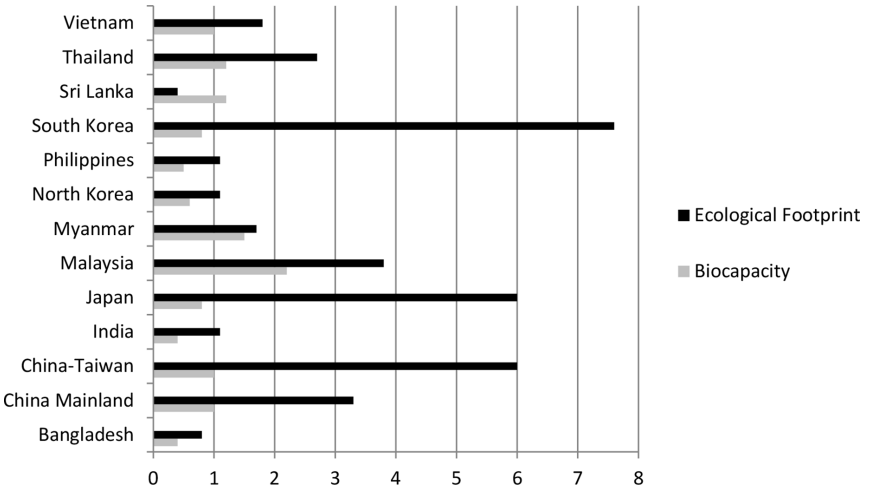


FIGURE 10 Biocapacity and ecological footprint of the major Asian fisheries, 2020
SOURCE: WORLD POPULATION REVIEW (2021)

species. Marine capture fisheries are affected by rising sea temperature and sealevel rise. In 2016, the *World Risk Report* ranked thirteen of the Asian fisheries with a high to very high risk of natural disasters (Garschagen, Matthias et al. 2016).[29] More drastic weather conditions have increased over the last decade, including intense storms that result in severe calamities to fishing communities along the coastal areas. Moreover, drastic changes in seasonal patterns have been observed in inland areas, including changes in rain and drought periods that alter inland water bodies (SEAFDEC 2017: 144–179).

For the sixteen Asian fisheries, climate change will continue to bring the threats that have begun in the 20th century: rises in sea level, rising temperatures of land, waterways and oceans, rising CO_2 levels, increased frequency of natural disasters, alteration of precipitation patterns, and increased frequency of extreme storms and flooding (World Bank 2013b). What will be the impacts of climate change on regional food security?

> The changing climate affects food production directly through changes in agroecological conditions, and indirectly by altering income growth and its distribution. ... Shifts in land suitability will likely lead to an increase in suitable cropland in higher latitudes and a decline of potential croplands in lower latitudes. Weather is expected to become more variable

29 Only Taiwan and South Korea were ranked with low risk. North Korea was not listed.

> and volatile, with more frequent and severe extreme events. Fluctuating crop yields and local food supply will make achieving food security more difficult. (ADB 2013: 62)

South Asia– which already exhibits the highest incidence of undernutrition in the world– will experience the highest degree of ecological instability and worsening food insecurity (Islam et al. 2021).

Climate change is likely to reduce yields for irrigated rice by 14 to 20 percent, for irrigated wheat by 32 to 44 percent, and for irrigated maize and soybeans by 2 to 18 percent (Rosegrant et al. 2013). Rises in sea level will cause the worst cropland and fishery impacts in Bangladesh, China, India, Indonesia, the Philippines and Vietnam (Islam et al. 2021). China's food self-sufficiency is likely to fall (Huang et al. 2017), and its need for increased imports will put added pressure on its neighboring fisheries. By 2050, prices for cereals and soybeans are projected to rise 20 to 70 percent throughout the Asian fisheries, exacerbating the intra-national inequalities among rural and urban communities and between poor and high-income households. Increased prices will bring lower caloric intake, so the number of malnourished children will increase by 2 million in South Asia and by 2.8 million in East Asia (ADB 2013: 65–66).

In the 21st century, illegal cross-border fishing has triggered ecological battle lines among the Asian fisheries (Williams 2013). Ecological changes are pushing China's massive fishing fleet far from home waters. China has lost half its coastal wetlands, 57 percent of its mangroves, and 80 percent of its coral reefs (Cao et al. 2017).Tensions between China, the Philippines, Japan, North Korea, South Korea, Indonesia, Vietnam and Malaysia have made international news (Park et al. 2020; Wilcox et al. 2021). In October 2020, ASEAN member states established a network for monitoring and surveillance of illegal cross-border fishing. In March 2021, China announced its launch of nine law enforcement actions, including a fishing ban in the Yangtze River, aquatic wildlife protection, the suspension of ocean fishing in summer, and proper use of inputs for aquaculture (Cao et al. 2017).

9 Intra-national Inequalities in Food Access

Joan Robinson (1979: 57) contends that "inequality of distribution is the main cause of the existence of large numbers of people who are unable to satisfy the need for even a minimum standard of nourishment." The first major level of inequitable food distribution occurs through trade commodity chains within the world food system. Previously, we have pointed to the food drains from

hungry Asian fisheries to regions of the world that are not hungry (see Table 5). We have described the inequitable global distribution of iron and protein from the Asian fisheries to regions of the world that utilize those foods as luxuries, not as essential survival requirements (see Table 6). We have also demonstrated that these Asian fisheries export high-iron and high-protein fishery commodities in exchange for less nutritious imports (see Table 8) that are causing a *double burden of malnutrition* in the Asian fisheries. Transformation of foods into nonfoods for export and to feed export livestock and aquaculture species have been prioritized over human consumption, driving up local prices and impacting poor households the worst (see Tables 3 and 4). Eleven of the Asian fisheries expend 1.3 to 17 times more to import livestock and aquaculture feeds than to acquire high-iron foods for humans, thereby privileging distribution of limited resources to animals being produced for export (see Table 9) over solving regional nutritional shortfalls.

Measured by the $1.25 a day standard, two-thirds of the world's poor are concentrated in the sixteen Asian fisheries, three-quarters of them in India and China (ADB 2013). Consequently, the second level of inequitable food distribution occurs nationally. In spite of impressive gains in production, extreme inequities persist within the Asian fisheries (FAO 2005: 3). Despite strong growth in GDP between 2000 and 2010, wealth and income were highly concentrated into the hands of the richest 20 percent while two-fifths to three-quarters of households remained poor (see Table 11). Between 2002 and 2013, food prices remained relatively static and cheaper in richer developed countries while foods were more expensive in the Asian fisheries. Between 2000 and 2010, food prices were not only higher than nonfood prices, they were also more volatile (ADB 2013). Since the Asian poor spend more than half of their household budgets on food, food price increases impact them far more drastically than richer households. Indeed, "a one percent increase in contemporaneous food price inflation leads to a 0.2% increase in infant and child mortality and a 0.4% increase in prevalence of undernourishment" (ADB 2013: XVII). And a majority of that undernourishment and child mortality occur disproportionately among poor rural households. As Table 11 shows, there is considerable inequality in the distribution of food in the Asian fisheries. About one-quarter to one-third of people fall below or above the national per capita intake of food, most getting less than average, some getting more. A major source of inequitable access to food lies in the systemic reliance on bonded and forced labor (discussed more fully in Chapter 8). In India (which has the highest incidence of both bonded labor and hunger among the Asian fisheries), the calorie intake of the poorest quartile is 30 to 50 percent less than the calorie intake of the top quartile of the population.

TABLE 11 Intra-national indicators of inequality that impact access to food

Fishery territory	% average annual GDP growth, 2000–2010	% population in poverty at $2 per day	Gini coefficient wealth distribution	% income held by highest 20%	% poor household budget spent on food
Part A. Ranked low by the United Nations human development index					
A [a]Bangladesh	5.9	76.5	.66	41.4	65.0
S Myanmar	6.8	NA	NA	NA	NA
S [a]North Korea	NA	NA	NA	NA	NA
A [a]Pakistan	3.5	60.2	.63	40.0	75.0
Part B. Ranked medium by the United Nations human development index					
M China-Mainland	9.1	27.2	.55	47.1	NA
A [a]India	5.0	68.8	.70	42.8	68.0
S [a]Indonesia	5.7	46.1	.77	46.0	22.0
S [a]Philippines	5.3	41.5	.72	49.7	61.0
M Thailand	5.3	41.0	.71	46.7	na
S Vietnam	6.2	43.4	.68	43.4	65.0
Part C. Ranked high by the United Nations human development index					
M Malaysia	2.3	NA	.73	51.5	NA
S [a]Sri Lanka	6.1	NA	NA	44.6	60.0
Part D. Ranked very high by the United Nations human development index					
L Japan	0.9	NA	.55	NA	NA
L South Korea	2.4	NA	.58	NA	NA

a low-income food-deficit countries (FAO 2011a). The letters before names indicate Global Hunger Indexes (Concern Worldwide 2010); A = alarming, S = serious, M = moderate, L = low. na = data not available. NA = no data available. No data available for Cambodia and Taiwan.

SOURCES AND NOTES: FAOSTAT; UNITED NATIONS (2011); IFPRI (2010); HTTP://DATA.WORLDBANK.ORG/TOPIC/POVERTY; FAO (2012B); HTTP://EN.WIKIPEDIA.ORG/WIKI/LIST_OF_COUNTRIES_BY_DISTRIBUTION_OF_WEALTH. THE COEFFICIENT VARIATION (CV) MEASURES THE INEQUALITY OF CALORIC INTAKE ACROSS A GIVEN POPULATION.

Food exporting drives up prices too high for the poor, even of basics. The poor primarily consume cereals because of the higher prices of fruits, vegetables, fish and meat; and their daily calorie consumption has steadily decreased since 1988 (Saxena 2008). In addition to volatile food prices, national social safety nets do not alleviate the inequitable impacts on the poor. According to the Asian Development Bank (2013: 37),

> most Asian countries use social safety nets of some kind, intended to shield poor and vulnerable groups from severe deprivation. ... On average, poor countries allocate lower proportions of GDP for social protection [than richer countries]. ... Moreover, given the inability to accurately target the poor when needed, the effectiveness of existing schemes ... is questionable.

In twelve of the Asian fisheries, more than 60 percent of the population earn their livelihoods from agriculture and fishing. Throughout the Asian fisheries, there are sharp inequalities in wealth and income distribution, access to waged jobs, public service delivery, and access to affordable foods, especially between rural and urban households (ADB 2013). According to the World Bank (2013a: 2), "the world's growing food fish supply gap impacts disproportionately on the nutrition and health of the poor." Domestically, expanded fish consumption occurs primarily among Asian urban populations, especially the middle classes (Toufique 2015). Rural households cannot afford the foods they produce because of the inequalities in the export commodity chains. Indeed, the rural households that produce food crops and fishery commodities receive much less of the final consumer prices than urban middlemen and export agribusinesses (ADB 2013: 47). As a result, undernutrition, child stunting, anemia, and other nutritional shortfalls occur much more frequently among rural Asian households. Access to food and nutritional shortfalls are also inequitably distributed along gender and age lines, with women and children suffering the highest incidence of hunger and anemia (see Table 2; McLean et. al 2009; Saxena 2008; IFPRI 2016). Ethnic minorities also experience a higher incidence of hunger and nutritional shortfalls than the rest of Asian populations (e.g., Diamond 2011).[30] In China, for example, school-age children of western rural provinces are six times more likely to be anemic than their urban peers (Fan et al. 2021), part of this inequality resulting from discrimination against ethnic minorities.

30 Scholars, international organizations and Asian national government programs have published very little about hunger and nutritional inequalities experienced by Asian minority groups.

10 Impacts of Wastage on Food Security

Preventing food waste will not insure that the hungry receive any greater share of production, and much of the waste currently occurs after purchase in the richer countries. As Eric Holt-Gimenez (2018: 38) points out, "people go hungry because they are poor, not because food has gone to waste." However, ending waste in producing territories might increase the amount of fresh food, especially fish, vegetables and fruits, that could be available for local consumption. Cutting food wastage in half would equate to enough food to feed one billion people annually (Rockefeller Foundation 2013). Each year, more than $750 billion worth of food is lost or wasted, endangering both the livelihoods and diets of a high percentage of low-income laborers in developing countries (Grundleger and Stewart 2014). Food *losses* occur during harvesting and processing while *waste* ensues during distribution and consumption. When scholars combine losses and waste, they employ the term *wastage*. A ground-breaking FAO report warns that "roughly one-third of food produced for human consumption is lost or wasted globally, which amounts to about 1.3 billion tonnes per year" (Gustavvson et al. 2011: 3). Consequently, one out of every four calories intended for people is never consumed by them (Lipinski et al. 2013).

In developing countries, food is mainly lost during the early and middle stages of agricultural crop and fishery supply chains. However, waste is minimal because households can only afford smaller amounts that are bought daily, and foods are often eaten even after spoilage begins (Gustavvson et al. 2011). More than three-quarters of these losses occur because of inefficient harvest techniques, inadequate storage and transport infrastructure, defective packaging and the lack of cold chains for preservation of fresh crops and fishery products (ADB 2013: 50–52l; Davy 2013).

> Although South and South-east Asia have the second-highest levels of global food *loss*, accounting for approximately 25% of global food loss, their food *waste* is minimal. Food loss constitutes 80% of all food wastage– loss plus waste– in the region. The majority of Asia ... suffers from infrastructure problems, including poor-quality roads, hot and humid weather (which drives spoilage) and poor packaging, all of which result in large quantities of food lost during production, storage and transit. While the economies of Asian countries are expanding rapidly, this economic expansion has not yet resulted in improved agricultural infrastructure. (Grundleger and Stewart 2014: 9)

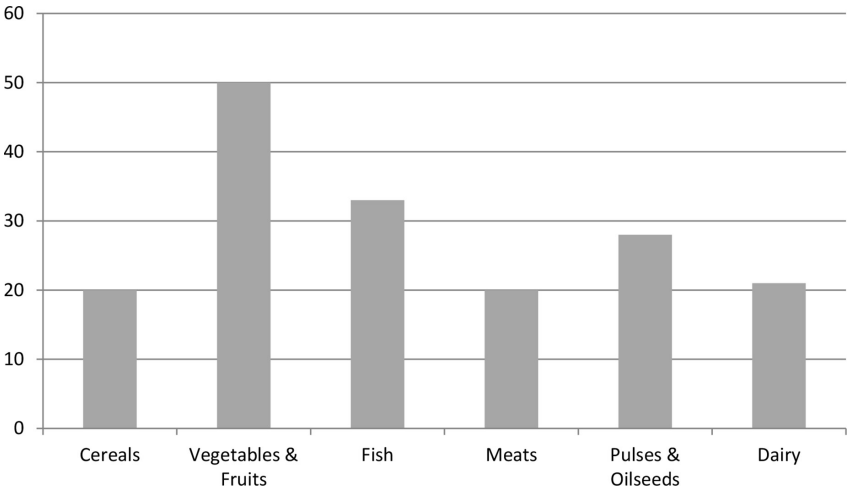


FIGURE 11 Percentage of food wastage, in East, South and Southeast Asia, 2010
SOURCE: ANALYSIS OF GUSTAVSSON ET AL. (2011). FOODS ARE GROUPED ACCORDING TO FAOSTAT FOOD BALANCE SHEETS. PULSES AND SEEDS INCLUDE SOY AND NUTS

Every day in 2009, food and fishery loss and waste eliminated more than 600 calories per capita from the diets of people in our target Asian fisheries (Gustavvson et al. 2011). As Figure 11 shows, 20 percent of cereals, 50 percent of vegetables and fruits, and more than one-third of Asian fishery output is never available for human consumption because it is lost or wasted between harvest and consumption. China, Indonesia, Myanmar and Sri Lanka could have cut their national fishery consumption shortfalls by about two-thirds if losses and waste had been sharply deterred. China generates about 53 million tons of food loss and waste each year, enough to feed more than half the undernourished people residing there (Marchisio 2020). Similarly, the national fishery shortfalls of Bangladesh, Pakistan, the Philippines, South Korea, Thailand, and Viet Nam could have been slashed by about half if loss and waste had been averted. Even those countries with the highest fishery shortfalls– India, Japan, Malaysia, North Korea– could have lowered those nutritional deficiencies by one-third through prevention of losses and waste.[31]

However, current estimates of wastage exclude a growing problem in global food security. Increasingly, foods are never consumed by humans because they are either contaminated or diseased. In rich countries, foods are frequently recalled or destroyed because they were contaminated with threats to humans

31 Part of fishery losses indirectly re-enter human food chains through conversions of fish meal, silage and sauce that is used in aquaculture and livestock feeds (Ghaly 2013).

in the production or distribution processes (e.g., E-Coli in lettuce in the US in 2018 and 2019). In addition, large numbers of livestock are destroyed almost every year because they are infected with diseases (e.g., the Mad Cow scare in Europe). Between August 2018 and June 2019, several East and Southeast Asian countries experienced the largest animal disease outbreak in history. African swine flu spread throughout the pork industry, eliminating 3.7 million hogs. The FAO predicted in June 2019 that China, which accounts for half of the world's pork production, would lose one-third to one-half of its swine before the epidemic's end. Because East and Southeast Asia produce about three-fifths of the world's pork, 2019 pork prices rose globally and throughout Asia (Dinh and McNeill 2019; FAO 2019b).[32]

11 Looking to Future Chapters

In Chapters 2 through 6, we will shift our lens from regional to national and local community levels. By focusing on one of the Asian fisheries, we will explore, in more human terms, the threats to Asian food security that have been identified in this chapter. We will offer an in-depth case study of the Philippines, a country that has declined from food sufficiency to dependence on imported foods and fish– even though it has maximized exploitation of its natural resources.

32 The European Union is the world's top exporter of pork. African swine flu outbreaks occurred in Eastern and Northern Europe between 2007 and 2018 while the first outbreak in Asia occurred in China in August 2018 (Marks 2018).

CHAPTER 2

Debt, Resource Exploitation and Integration into the World Agro-Food System

Abstract

By offering a case study of a nation that is both a major fishery exporter and a food-deficient country, we explore the linkages between external debt and the integration of Asian resources into the global food trading system. The urgent need to acquire foreign exchange to repay spiraling debts became the national justification for privatization and exploitation of public commons, especially coastal waterways and mangroves. By targeting its natural resources and peasant laborers for export exploitation, the Philippine government systematically integrated its agriculture and fisheries into the global food system. Initially, we examine the role of Philippine elites in neoliberal restructuring. Subsequently, we investigate how state promotion of export strategies in agriculture, capture fishing and aquaculture shifted the country away from food self-sufficiency. In the final section, we describe the ecological impacts of these export approaches.

> The food crisis is both scourge and irony: hunger amidst plenty, starving millions existing side by side with the overfed few. Nothing better demonstrates the distorted priorities of the capitalist world than the terrible inequities of food distribution. ... While millions of Third World peoples are underfed or starving, their countries are exporting food.
>
> (Philippine scholar RENATO CONSTANTINO 1988: 1–2)

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Between 1998 and 2015, the Philippine GDP growth rate averaged less than 1.2 percent, inflation repeatedly escalated, and the unemployment rate averaged nearly 9 percent.[1]

1 Analysis of economic data and trends, OpenSTAT, 1998 to 2015.

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> The economic performance of the Philippines has lagged behind most other developing countries in Asia. Whereas the Philippine economy and its agriculture sector performed moderately well in the 1960s and 1970s, because of the early advent of the Green Revolution in rice and the world commodity boom, the country has had the lowest average growth rates in gross domestic product, gross value added in agriculture, and agricultural exports over the past two decades in South and Southeast Asia. (David et al. 2007: 1)

Since 2013, the country has exhibited some industrial growth fueled by the production of components outsourced by electronic corporations based primarily in China and South Korea (Clelland 2014). As a result, the Philippines was the world's largest center for business process outsourcing by 2015, making its economy highly vulnerable to the continuing expansion of Chinese manufacturing exports and to consumer technology demand in the United States, the European Union and Japan.

Despite these unstable economic trends, the Philippines carries a higher debt burden than most Asian countries. In 2010, Philippine debt was nearly eight times greater than its 1990 level and had grown to 56 percent of the Gross Domestic product, representing per capita debt of $768 (ADB 2012).[2] As a result, the Philippines has borne more severe economic, social and ecological costs for its external indebtedness than most of its Asian neighbors. Since 1984, the Philippines has undergone economic restructuring through nine structural adjustment programs, four standby programs, and two extended fund programs. Each of these restructuring phases increased its external debt. Moreover, the country will be servicing the huge debt incurred by the Marcos dictatorship until at least 2025 (Escobar 2004: 17). By 2003, debt had reached 78 percent of Philippine GDP, and service on the debt amounted to 27 percent of the national budget (Abinales and Amoro 2005: 286). By 2006, the country's debt had climbed to more than $53 billion, and the government was expending one-third of its annual budget to service external debts (Patenio and Tan-Cruz 2007: 3). The "urgent need for foreign exchange" to meet debt obligations pushed the government to target natural resources for export agendas (Anderson 1987: 263). In the sections that follow, we will explore the processes through which the Philippines integrated its agriculture and fisheries into the global agro-industrial food regime.

2 All monetary values are expressed in $US. In order to insure that we are comparing monetary values that were not distorted by inflation over time, we standardized all values at the 2000 exchange rate with the $US.

1 The Role of External Development Agencies

By the 1960s, the International Monetary Fund (IMF) and the World Bank were broadening their activities in the Philippines, and they were pressuring the country toward an export-led growth model. In the 1970s, the World Bank initiated loans to the Philippines that were designed to increase agricultural production for export and to improve rural infrastructure, such as trade roads. The Bank's top-down approach was "oriented away from domestic needs" and was intended to restructure the country's peasant production systems (Kwiatkowski 1998: 39–41). Since 1980, the Philippines has undergone fifteen phases of structural adjustment, with the IMF goal of positioning the country to repay its accumulated debts through widened export production. In the 1980s, debt repayment amounted to a "financial hemorrhage" of 10 percent of GDP annually. Expansion of the domestic market and poverty reduction to build local purchasing power were "sacrificed to the national priority of repaying the foreign debt." Between 1980 and 1983, the IMF economic restructuring required trade liberalization, followed by the 1983–1992 era in which the focus was upon debt repayment strategies, accompanied by export agendas to earn foreign exchange. Between 1992 and 2000, the IMF mandated free market transformations for the Philippines, including privatization, rapid deregulation, and opening the country to foreign imports and investments (Bello and Dorcena 2004: 14–27). The 1989 IMF-mandated structural adjustment program: (a) devalued the Philippine peso; (b) liberalized import mechanisms to such an extent that the country developed a trade imbalance between agricultural exports and imports, particularly foodstuffs; (c) privatized lands, industries and public service; and (d) deregulated price controls and subsidies, inflating prices on food, goods and services.[3] The IMF and the World Bank bypassed the state to provide financing for credit programs directly to processors, traders and market retailers of food. By routing their funding through banks, the two agencies insured that most of the loans fell into the hands of the largest capitalists, with extremely limited assistance to small producers and peasants (Lindio-McGovern 1997: 56–65).

In the early 1990s, structural adjustment loans "were designed to accelerate industrial growth, invigorate the agricultural sector ... and expand rapid growth of nontraditional exports." Throughout this era, there was a steady flow of foreign loans and grants into the Philippines, and all these projects were conditioned upon further liberalization of the country's economy, especially

3 The value of the country's currency has steadily declined. In 1985, the exchange rate was 26 pesos per dollar (McCoy 1994: 540). By 2005, the exchange rate had climbed to 55 per dollar.

its agriculture, fishery and food processing sectors (Kwiatkowski 1998: 45). Participation of the Philippines in the ASEAN Free Trade Agreement required the country to offer preferential tariffs to member countries, and this change paved the way for further liberalization of the fishing industry. By 2002, the Philippines agreed to remove protective tariffs on fish commodities and to open the country to imports from other Asian states. These policy changes hit Mindanao particularly hard, for more than 40 percent of Japanese and ASEAN trade targets this island (Escobar 2004: 39). To cement the role of the Philippines in the ASEAN Free Trade Zone, the Asian Development Bank provided funds to improve the country's export infrastructure, a sizeable segment aimed at Mindanao. To decrease losses due to spoilage, refrigeration facilities were developed and leased to private enterprises and regional fishing ports were constructed to expedite export (ADB 1999: 12).

2 Philippine Elites and Economic Restructuring

Between 1979 and 1982, one of the direct effects of the restructuring policies of the IMF and the World Bank was the transformation of national politics. "Within the state, nationalists lost every foothold of influence on policy formation, as transnationalists assumed hegemonic control of all major ministries. Within the private sector, economic nationalist factions whose enterprises depended on domestic markets were decimated as a class" (Broad 1988: 13). Only 134 families have controlled the country's Congress over the past century (Coronel 2004), and these elites also own the nation's manufacturing companies and agricultural land (Rivera 1994). According to Bello and Dorcena (2004: 71), much of the fiscal and economic crisis of the Philippines derives from the nation having been "subjugated by a succession of ruling elite factions who served narrow interests instead of the larger goals of sustainable development and social justice." According to Kang (2002), crony capitalism lies at the heart of the country's economic inequalities. Coronel (2004: 112) contends that the ruling elites "represent what is so wrong with the Philippines and so many other poor countries: the rampant bribery and fraud, the unbridled rent-seeking, the brazen patronage politics, the flagrant abuse of public resources for private gain, and the widespread clientelism." Bello and Dorcena (2004: 34) point out that the state has been strangled "by competing factions" that render it "too powerless to even chart the country's direction, much less subordinate ruling elites under its control. Further sapping the state's potential to act ... have been external interests constraining its range of allowable actions in the larger context of the North's persistent and often successful efforts to subordinate the South."

By the early 1980s, every major sector of the Philippine economy was controlled by foreign interests that acted in concert with the country's most powerful families (Planas 1980; Aquino 1982). At the time of the fall of the Marcos regime in 1985, a caucus of peasant activists advocated a set of principles that challenged the incoming administration to take a different direction. Representing the interests of the poor, this group called for less government focus on "the world capitalist market" and greater attention to "improvement of the purchasing capacity of the local consumers" (Schirmer and Shalom 1997: 388). The next presidential administration did not heed the advice of these peasant groups. Acting like a *comprador bourgeoisie* (Amin 1977: 7) for transnational capitalism in the late 1980s, key Philippine government advisors and neoliberal technocrats fostered a program of unilateral trade liberalization that eliminated many of the country's protective tariffs, especially on food commodities. Philippine scholar Rene Ofreneo (2013: 22) insists that this group of powerful politicians and bureaucrats imposed a very narrow liberalization program, through which they "managed to destroy many of our domestic industries." Similarly, Bello and Dorcena (2004: 22) argue that "they brought about an indiscriminate liberalization of trade that has destroyed many local industries, destabilized agriculture, and thrown hundreds of thousands of people out of work."

Through such liberalization polices, this powerful political cadre imposed the policies that would best serve the interests of economic and political elites in the country. "These academics and consultants came to power armed with a very uncomplicated approach to policy making: radically reduce the role of the state, radically expand the play of market forces. "In the name of market efficiency and weeding out corruption, they set about dismantling the state's role in planning, production, trade and finance. Not surprisingly, under their watch, an already weak Philippine government bureaucracy was even more thoroughly colonized by private interests" (Bello and Dorcena 2004: 23–24). Paul Hutchcroft (1998: 2) refers to these economic elites as "booty capitalists" because they are "a powerful business class that extracts privilege from a largely incoherent bureaucracy." One Philippine economist points to the system of patronage that underlay the relationship between these elites. The government provided to elites crucial resource advantages, such as licenses and fishpond leases, effectively assigning to them relatively monopolistic control over public lands and waterways (Krueger 1980: 52–57).

3 Government Promotion of Agricultural Exports

In the 1980s and 1990s, the incidence of hunger and malnutrition steadily rose, and the Philippines was the seventh poorest country in the world. By

1991, nearly 70 percent of the population was malnourished, and vitamin and nutritional deficiencies were a major cause of mortality (Kwiatkowski 1998: 7–8). Against the backdrop of these desperate human needs, the national government followed the mandated structural adjustment plan to prioritize crop production for export over domestic consumption. Between 1994 and 2006, the country expanded the total quantity of its agricultural exports by nearly 25 percent but acquired only a 34 percent increase in revenue. Philippine agricultural exports were worth about $439 per metric ton in 1994, and only slightly more per metric ton in 2006. Even though the country increased its quantity of cereal exports (primarily corn) nearly seven-fold, the value of those additional exports was only 2.7 times greater than the value of cereals exported in 1994. Due to the declining exchange rate of the peso and volatile market prices, the country lost ground in the value of most of its export commodities. The 2006 value of a metric ton of foodstuff exports fell below its 1994 value. Similarly, a metric ton of exported cereals was worth 37 percent less in 2006 than in 1994. Despite the country's prioritization of luxury fish in high demand on world markets, the value of a ton of fishery products was 15 percent lower in 2006 than in 1994. The worst decline occurred in cereal exports. By 2006, the value of a metric ton of cereal exports had fallen to 63 percent of its 1994 value. We cannot account for this sharp drop by assuming that the later exports were of lower quality because there was greater reliance on hybrids and Green/Gene Revolution chemical inputs in 2006. Moreover, the Philippine government was relatively consistent in the crops it targeted as "high-value" priorities for development. Corn, tropical fruits, and coconut oil headed that list throughout this period. Consequently, these statistics provide an alarming picture of the vicious cycle in which the country is trapped. In order to try to offset declining terms of trade, the government repeatedly advocated more intensive agriculture, attempting to generate greater outputs to try to offset its declining revenue from exports.[4]

Even if one believes that it is possible for a peripheral country to attain Ricardo's *comparative advantage* in the world economy, there is certainly no "specialized market niche" reflected in any of the exports that have been leaving the Philippines since 1994.[5] In 2006, UN COMTRADE ranked the Philippines 140th out of 181 nations that exported the same agricultural commodities. Clearly, the country's share of the world market had declined. Many developing countries export the same commodities because there is demand in richer countries and because all the poor countries receive the same advice from international development agencies. As a result, the high supply of those

4 Analysis of export-import data, 1994–2006, BAS.

5 For an explication of Ricardo's notion of comparative advantage, see Pullen (2006).

commodities keeps prices lower. Moreover, all these countries are sending to the world market crops that will enter the commodity chains of a few multinational corporations that determine the prices.

In 1980, the value of Philippine food exports was 3.6 times greater than its food imports (FAO 1989). By the early 1990s, the country shifted from being a net agricultural exporter to being a net agricultural importer. In 1994, the country expended 2.5 percent more on agricultural imports than it received for its agricultural exports. By 2006, the situation was far more grim because imports were worth 1.9 times more than exports. Between 1994 and 2006, the value of imports swelled 84 percent while the value of exports grew only 34 percent. Even though the government advocated increased output to offset its declining terms of trade, that strategy did not work. While the quantity of exports increased about 25 percent between 1994 and 2006, the quantity of imports escalated 84 percent.[6] Obviously, producing and selling greater amounts has not generated greater revenue for the country, but the government continues to promote expansion of these cash crops, despite the country's declining terms of trade in these commodities. Because the country's debt has been steadily rising due to development loans and annual cost of food shortfalls, the government intensified its commitment to exports that require natural resource exploitation. Rather than solving the country's debt crisis, this export orientation has generated massive trade imbalances that have driven the country deeper into debt.

Contemporary Philippine politicians, technocrats, and capitalists continue to pursue world markets for plantation crops that have been in place for decades, without assessing the likelihood that there will be future price declines as more competing countries enter the trade arena. As a result, a few export crops have been deeply embedded in corporate agro-industrial commodity chains for decades. Thirty years ago, coconuts and bananas were the country's major farm exports, and the Marcos regime shielded banana and coconut plantations from agrarian reform (*New Internationalist* 1979). The government continues to prioritize the interests of these plantation owners and corporations (cf. Republic of Philippines 2000). Banana and coconut farming receive heavy government subsidies, and the monopolies controlling these industries have never been fully dismantled (Dolan 1991). In 1985, more of the cultivable land was planted in bananas, coconuts, pineapples and sugar than any other crops. Two multinational corporations, Campbell and Hershey, operated food processing plants that prepared mango puree and tomato paste for export, and

6 Analysis of export-import data, 1994–2006, BAS.

their operations were typical of the corporate activities of the 1980s. Local food crops were re-oriented and processed to fit the tastes of distant western consumers (Constantino 1988: 8–9). Between 1981 and 1989, such natural resource exports accounted for nearly half the value of all the country's exports, even though their volatile world prices failed to relieve the country's growing debt problem (Pineda-Ofreneo 1991: 14).

During the 1990s, coconut oil and bananas were still the country's largest volume agricultural exports, and the Philippines was the third largest banana exporter in the world. Between 1988 and 1997, world export of bananas doubled, and Dole Philippines enlarged its plantations and contract farming throughout the country. Between 1995 and 2007, the production of bananas grew more than any other major cash crop. Over this period, the country's banana output increased nearly 77 percent and was employing nearly 29 percent more land area in 2007 than in 1995.[7] In reality, only 5 percent of the profits from the retail price of a banana accrues to the producing country (*New Internationalist* 1999a). At the turn of the 21st century, three multinational corporations (Dole, Chiquita, and Del Monte) controlled two-thirds of world trade and pricing in this commodity (FAO 1999). Because revenue returns were small, the government had to count on high volumes of bananas, so public funds were allocated to double the number of banana trees between 1990 and 2008.[8] The coconut monopoly that was established in the Marcos era was successful at securing legislation that excluded coconut plantations from redistribution by the agrarian reform program (Kang 2002: 140; Bello et al. 1982: 186).[9] The government-funded Coconut Industry Development Fund financed the research for a hybrid coconut tree and undertook a replanting program to replace older trees on 2.9 million hectares with a hybrid that merged qualities of Malaysian and West African varieties (Dolan 1991) and transformed the country into a coconut monoculture (Constantino 1988: 55). By 1988, one-third of the country's coconut trees were still low-producing, so the government subsidized the replacement of older coconut trees with new higher-yielding varieties that were imported from the Ivory Coast (Cruz 1997: 11). Even though government attention had been directed to expansion of the coconut industry in the 1980s,

7 Analysis of banana crop data, OpenSTAT and FAOSTAT.

8 Analysis of crop data, OpenSTAT and FAOSTAT.

9 According to Kang (2002: 140), "sugar, coconut and grain all became monopolies under Marcos and were given to his cronies under the guise of rationalization." By presidential decree, Marcos "ordered all coconut processing companies to sell out or affiliate with UNICOM" (Bello et al. 1982: 186).

coconut production grew only 16 percent over this twelve-year period, and land cultivated in coconuts expanded only about 9 percent.[10]

In June 2009, the Philippine Secretary of Agriculture conducted a public briefing for potential foreign investors that reflected the continuing prioritization of plantations. The country widened its production of "big-ticket, high-value crops for potential ventures by foreign investors," he told the group of Asian and European business representatives, and the country's "preferred investment areas" were coconuts, bananas, pineapples and mangoes. He bragged that the country supplied 12 percent of the world market in bananas but was the world's number one producer of dried banana chips. He added that the country was third in the world in export of pineapples and seventh in mangoes. He told the group that the Philippines produces and exports half of world trade in coconut oil, making the country number one in this commodity (*Fresh Plaza*, 8 June 2009).

In addition to these cash crops that had been cultivated for decades, the government targeted expansion of livestock and poultry for export, starting in the mid-1980s. While these increased outputs are a reflection of the government's reaction to global demand, the growth in export meats is largely due to the expansion of contract farming in chickens and hogs since the late 1980s. In 1986, the Philippine Minister of Agriculture called for an expansion of livestock production through contract farming. Calling for foreign capital from multinational corporations, he alerted "all the people, institutions, and countries that want to invest in agriculture to direct their attention to the establishment of processing plants and to develop areas they would need for contract farming" (*Malaya*, 9 June 1986). As a result of this government priority, there was a shift to hog and cattle production that led to deforestation of vast areas to make way for foreign-controlled corporate ranches. At this point, the new livestock industry was dependent on imported feeds, and hybrid pigs and chickens displaced traditional varieties. Since 70 percent of 1980s livestock and poultry production cost lay in imported feeds, the government subsidized rapid increases in corn that could be used as animal feeds (Constantino 1988: 41). In its Medium-Term Development Plan the government set the goal of opening 45,000 new hectares for livestock and poultry (Republic of Philippines 2000). Between 1995 and 2007, the volume of chickens processed in dressing plants doubled while processed hogs increased 1.5 times over 1995 levels. Since 1980, corn production has steadily increased to accommodate local and global demand for animal and aquaculture feeds. Over the 1980s

10 Analysis of coconut crop data, BAS.

and 1990s, corn utilized nearly one-quarter of farm land, and total production increased 63 percent.[11]

Despite government projections for large crop expansions, the country increased the land available for farming by less than 2 percent between 1995 and 2008.[12] Since a high proportion of these targeted cash crops are produced in Mindanao, this island will be inequitably impacted by any long-term effects from more intensive agriculture strategies (Menguita-Feranil 2007: 4). More than 43 percent of the country's farms are situated in Mindanao, producing 87 percent of the country's pineapples, 77 percent of bananas, 58 percent of coconuts, and 56 percent of corn. For that reason, the government allocated $19.1 billion for Mindanao agribusiness infrastructure and the expansion of "high-value" export cash crops between 2007 and 2010 (Balane 2009).

Since farm land area has barely increased between 1995 and 2005, how does the government expect to expand the country's output of additional exports? First, the country's Medium-Term Development Plan allocates $1.8 billion to develop 2.4 million additional hectares in "non-traditional high-value crops" through the "transformation of farm lands into agribusiness enterprises" (Republic of Philippines 2000: Ch. 1). This strategy will require conversion of land to export crops, large agribusinesses and fishponds that once produced for domestic consumption (Menguita-Feranil 2007: 16). Second, the plan will stimulate widespread adoption of hybridized and genetically-modified strains and dependency on imported fertilizers, pesticides, and livestock feeds. Every year since 1994, fertilizers and feeds have accounted for nearly one-fifth of the total value of all agricultural imports, and the cost of these inputs has steadily risen. By 2006, the import value of these agricultural inputs negated 24 percent of the total value of all agricultural exports.[13] Third, small producers were put at risk, as corporations and absentee investors structured contract farming as the primary mechanism through which cash crops and livestock production were expanded.

4 Government Promotion of Capture Fishing for Export

Just as valuable to the country as its farm lands are its resource-rich coastal areas. Nestled along the Pacific Rim a few degrees above the equator, the 7,100-island Philippines possesses one of the world's best natural endowments

11 Analysis of corn crop and land use data, BAS.

12 Analysis of land use data, BAS.

13 Analysis of land use and import data, BAS.

of tropical marine and coastal resources. The country's coastlines include 200 million hectares of marine waters, a 200-mile Exclusive Economic Zone, 260 million hectares of coastal waters, and 193.4 million hectares of oceanic water. The Philippines has one of the world's largest coral reef areas, the world's second highest sea grass diversity, and 840,000 hectares of inland waters (World Bank 2004). Coral reefs around the Philippines contain 500 of the world's 700 known coral species (World Bank Philippines 2003). The fishing industry consists of two sectors: (a) the municipal sector which consists of coastal and inland waters regulated by municipalities, and (b) the commercial sector of vessels larger than three tons that are legally restricted to deeper waters.[14] In the late 1940s, most of the local fish consumption was captured by peasant fishers using small gears and nets from dugout canoes "along shores in shallow water. There was also some use of large stationary nets to catch tuna that came close to shore" (Herre 1945: 158). In the 1950s, fishing was primarily a part-time endeavor. "Most of the people [we]re engaged in both fishing and farming while ... very few [we]re devoting themselves entirely to the fishing industry" (Rasalan 1957: 86). By the 1970s, many relied more on fishing and less on farming (Goldoftas 2006: 90).

In the 1980s and 1990s, the Asian Development Bank provided $32.7 million to fund a public credit program for capture fishing. Even though the government claimed in its loan proposal that its intended beneficiaries would be small fishers, a majority of the loans were extended to commercial fishing companies and to large fishpond operators. In a subsequent evaluation of this program, the Asian Development Bank (1999: 22) acknowledged that "these loans to fishery projects ... aggravated the marine resource depletion ... as more powerful motorboats and modern fishing gear were purchased." Such policies stimulated expanded use of intensive fishing gear, such as large stationary netting systems that ensnare massive amounts of fish from the tidal flows. Overfishing was further exacerbated after the 1998 Fisheries Code which broadened the access of large vessels to deeper municipal waters (Krinks 2002: 131).

As a result, government policies prioritized the acceleration of capture fishing to support export of fish, crustaceans, and exotic species in high demand in richer countries. Throughout the late 1970s and early 1980s, the government promoted the country's fisheries "to other countries as a new economic frontier: 'untapped, 'vast,' and 'rich'" (Goldoftas 2006: 89–90). By the late 1970s, the twenty largest licensed corporations dominated commercial fishing through

14 Until 1998, larger commercial vessels were prohibited from fishing in municipal waters, but the 1998 Fisheries Code opened deeper municipal waters to some larger vessels (Republic of Philippines 1998).

the operation of 416 vessels that employed intensive capture methods to harvest 81 metric tons each (Philippine Annual Fisheries Profile 1977: 12). Between 1988 and 2006, capture fishing accounted for a majority of the seafood production in the Philippines, commercial and municipal vessels accounting for about the same levels of output in most years. In 2006, these two sectors generated nearly 70 percent of the value of all seafood production in the country.[15] Tuna has been the most important capture fish export since the 1970s (Vera and Hipolito 2006), and tuna production has expanded significantly. Commercial vessels trawl the deep sea with massive purse seine and ring net mechanisms while smaller wooden boats in municipal waters employ handlines or longlines. In 2005, tuna production reached 173,960 metric tons, two-thirds of it captured by commercial vessels, one-third caught in municipal waters (Philippine Annual Fisheries Profiles 2005). In 2007, tuna accounted for more than 43 percent of the total quantity of seafood exports and 38 percent of their total value.[16] In 2008, fishers captured more than twice as much tuna as they had in 1992, and one-third to one-half of this production was exported (PDA 2005).[17]

By the early 1990s, there was a boom in tuna exports to the US, western Europe, and Japan from the island of Mindanao. In Mindanao, the primary export point for tuna is General Santos City Fish Port that was funded by Japan to provide markets, ice plant, cold storage, and canneries for rapid processing of the fish. Since 1998, 400 metric tons of tuna have been unloaded daily at this port, 60 percent of it exported to Japan. By 2009, dwindling tuna catches were impacting livelihoods of Mindanao commercial fishers (*New Humanitarian* 2009). In 2019, however, the General Santos City website bragged: "What was once packaged in makeshift baskets in the domestic market has metamorphosed into canned, fresh, chilled, frozen, and smoked commodities in the international market."[18] In addition to tuna, the Philippines annually averages 35,000 metric tons of crabs, 16,000 metric tons of shrimp, 281,000 metric tons of roundscad, and nearly 58,000 metric tons of squid and cuttlefish (PDA 2005). Since 1995, captured fish accounted for two-thirds of the value of all the country's fishery exports.[19]

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15 Calculated using Primavera (1997) and Philippine Annual Fisheries Profiles (2000, 2006, 2008).

16 Calculated from Philippine Annual Fisheries Profiles (2008). The total export value reflects the free-on-board value of all fresh and processed seafood in each category.

17 Analysis of fishery data, 1992–2008, BAS.

18 See www.gensantos.gov.ph/fishery1.php (accessed 5 July 2019).

19 Calculated from Philippine Annual Fisheries Profile (2008, 2010). The total export value reflects the free-on-board value of all fresh and processed seafood in each category.

5 Government Promotion of Acquaculture for Export

The Philippines has the world's largest area of brackish water fishponds that lie at the interface between freshwater and marine ecosystems. Despite this infrastructure, aquaculture is not a major contributor to the country's GDP. However, this massive agri-industry employs one million out of the 30 million labor force (Philippine Annual Fisheries Profile 2008). The Philippine government has promoted the expansion of aquaculture through five historical stages: (a) small-scale traditional fishing and polycultural fishponds before 1950; (b) polycultural fishponds of the 1950s and 1960s; (c) the boom in monocultural ponds for world markets, 1975–1980s, (d) the aquaculture crisis of the 1990s; and (e) aggressive aquaculture promotion since 2000.

Fish farming has existed in the Philippines for many decades. The country's first fish pond was recorded in 1863, and small-scale pond fishing was common at the turn of the 20th century. Surrounded by earthen dikes, these early extensive fishponds were used for polycultural production of fish and shrimp, and they degraded the ecosystem far less than later intensive technologies. In 1920, the country had 450,000 hectares of mangroves which were slowly developed into fishponds at the rate of about 760 to 1200 hectares per year between 1920 and 1940. In the 1940s, the mangrove conversion rate increased to about 1,176 hectares annually. In 1947, fishpond development was further spurred by the formation of the Philippine Bureau of Fisheries and Aquatic Resources (Primavera 1995).

Fishpond construction increased at 5,000 hectares per year in the 1950s and 1960s after the International Bank for Reconstruction and Development provided loans "to accelerate the conversion of vast areas of marshlands (mangroves) ... into productive fishponds" (Primavera 2000: 93). In this period, the Philippine government prioritized aquaculture as a strategy to feed its own citizens, and there were national import substitution restrictions to protect this fledgling industry. In 1965, the Philippine Fishery Commission was established to conserve natural fishing resources for domestic consumption and to restrict importation of fish. In 1967, there were 140,055 hectares of fishponds, about 40 percent privately-owned, the rest operating on 25-year renewable leases from the government (World Bank 1976). In 1968, the total fishpond area rose to 165,873 hectares of which 53 percent were privately-owned. Throughout the 1950s and 1960s, most of the country's fishponds employed traditional polycultural methods that relied on tidal waters to feed fishpond stocks. In the late 1960s, smaller-scale polycultural ponds predominated, with larger aquaculture ponds generating about 10 percent of farmed fish. Aimed at local markets, milkfish constituted 95 percent of the production (Primavera 1995).

Between 1965 and 1975, fishery production more than doubled while per capita consumption increased by almost 50 percent (World Bank 1976). During this decade, commercial monocultural aquaculture grew very little. Since traditional methods generated no foreign exchange to repay debts, the World Bank advocated to the Philippine government the need for the country to shift to commercial aquaculture by exploiting its mangroves more intensively. The country's first export of prawns was recorded in 1968 at 179 metric tons valued at $149,000 (Primavera 1993).

5.1 *The Boom in Monocultural Ponds for World Markets, 1975–1980s*

In 1973, the World Bank pressured the Philippines toward re-orienting its fishery sector for export production. The Bank offered loans of $23.6 million on the condition that the country liberalize its fisheries and commercialize its production processes. The Bank required the government to use the funds to extend credit to fishing vessels no smaller than 45 to 70 tons, thereby excluding peasant fishers from this economic growth agenda (Illo and Polo 1990: 19). At the same time, Japan and the US pushed for relaxation of Philippine restrictions on foreign investments and exploitation of fishery resources, and both countries dangled loans and development aid to facilitate the transition. The 1975 Fisheries Modernization Act effectively integrated into the global agro-industrial food regime fishing grounds that had traditionally provided the livelihoods of peasant fishers. With the passage of this act, contends Philippine scholar Renato Constantino (1988: 38–39), "the country's fishing industry ceased to be ours and became Japan's." The legislation declared fishing a "preferred area of investment," opened the country's coastal waters to foreign capitalists, and re-defined the country's resource-rich mangroves to be "swamplands available for development." To entice foreign investors, the government offered the incentives of a 40 percent equity ratio in joint ventures, tax exemptions, and freedom from national expropriation (Republic of Philippines 1975). Through other Presidential decrees, coastal waters were opened to large foreign vessels, especially many from Japan, and the government began to subsidize facilities to freeze and can seafoods for export. International aid to aquaculture almost doubled between 1978 and 1993, and Dole Philippines and companies from thirteen countries made significant investments in Philippine shrimp farming. Early shrimp aquaculture relied heavily on Taiwanese technology, and the Philippines pioneered export of black tiger shrimp to Japan (Krinks 2002).[20]

20 Companies from the following countries invested in 1980s Philippine shrimp farming: Japan, Taiwan, Singapore, Australia, Canada, Germany, England, Italy, Netherlands, Norway, Spain, Switzerland, and the USA.

This legislative change laid the groundwork for a few well-financed individuals to gain monopsonistic control over natural resources. The highest bidder was guaranteed "exclusive rights to the construction and operation of fish corrals, oyster bed culture, or the gathering of milkfish fry or the fry of others species in municipal waters."[21] According to Philippine scholar L. S. Cabanilla (1997: 9–10), "the export promotion measures included improved export financing facilities, duty-free or low tariff access to inputs by export producers, tax holidays and other fiscal incentives for export production and trading, elimination of export tax on all products except logs, and restructuring the investment incentive system to encourage export ventures." Thirty-eight of the country's 73 provinces were targeted for aquaculture promotion, and coastal foreshores were leased for up to 75 years (Krinks 2002). As a result, fishpond resources were concentrated into the hands of large operators. Even though a fishpond lease was legally restricted to 250 hectares per corporation or 50 hectares per individual, twenty leaseholders controlled 4 percent of the public fishpond area, and their holdings averaged 333 hectares in 1980 (Philippine Annual Fisheries Profile 1980, 2001). The wealthiest families controlled prawn cultivation in most provinces, and foreign corporations were provided special subsidies to undertake rapid shrimp farm development. For instance, Dole Philippines was given a four-year tax abatement to establish prawn farms in Mindanao, and the corporation targeted eleven provinces for fishpond development (Broad and Cavanaugh 1993: 73–89, 178).

Despite the egalitarian rhetoric of the legislation, fishponds were too expensive for development by small fishers. An applicant for a fishpond lease was required to pay a $400 fee, along with proof of capital assets of about $200 per hectare. An initial investment of $13,700 to $27,300 was needed to construct and stock a one-hectare pond, followed by a similar amount in operating funds. However, lease fees for public lands were cheap (Philippine Annual Fisheries Profile 2001). The Asian Development Bank (1999: 7) reported that the fees "paid for the privilege of using fisheries and fisheries-related resources are significantly below what the scarcity of the resource and its long-term value demand." However, "a successful lobby by the aquaculture industry has indefinitely postponed the implementation of a fee increase" (Krinks (2002: 98–99). Large Philippine agribusinesses in joint ventures with foreign investors have had "a monopoly on the industry and the credit offered by banks and financial institutions" (Primavera 1991: 36). By allocating 70 percent of the loans to large pond operators in the 1980s and 1990s (ADB 1999: 22), the government

21 A fish corral is a large commercial stationary netting system that captures fish from tidal currents.

laid groundwork for concentration of ownership of aquaculture facilities into the hands of Philippine elites and absentee speculators. As a result, three corporations accounted for half to two-thirds of the shrimp exports in the 1980s.[22] Prawn growing stimulated the emergence of ancillary activities, such as hatcheries, nurseries, buying stations, processing plants, and feedmills, many of them subsidized by the government. Some of the larger aquaculture corporations engaged in contract farming and sharecropping arrangements with small pond operators who took on debt with the company for the necessary initial start-up expenses, stock, feed and chemicals (Krinks 2002: 132).

Following World Bank advice to increase export-oriented fish productivity, the Philippines established its Fishery Development Authority in the 1970s (World Bank 1976). This new public agency accelerated pond development by extending government leases from ten years to 25 (Primavera 2000). Subsequently, fishpond land use more than doubled, and the expansion in this era would account for a majority of the ponds that operated through 2005.[23] Peasant fishers who surrounded redeveloped mangroves were publicly stigmatized to be outdated relics in need of modernization (Primavera 1995). The 1975 act promised to develop "modern fishpond villages" run on a cooperative basis with government supervision and financial assistance (World Bank 1976: 145). However, most small fishers were transformed into squatters on public lands that had been reallocated to individual users with sole legal right of access to former public commons. Even though the decree promised credit and research support, commercial and foreign investors benefitted from the vast majority of these funds. By the early 1980s, less than 10 percent of small fishers had received any government credit, and many fishers were dispossessed of their traditional fishing grounds after the government granted monopolies to commercial fishers (Illo and Polo 1990: 18).

In the early 1980s, Japan began to encourage neighboring Asian nations to embark in shrimp culture production (Bailey 1988a; Chong 1990). In this period, most fishing corporations were Japanese or were joint ventures with Japanese investors, and a majority of the technology and technical expertise were provided by Japan (*Mindanao Focus*, 4 May 1984: 17). When the Asian "shrimp fever" in aquaculture was fueled by external loans and Japanese investments in the early 1980s, the Philippine government sponsored an 8,000-hectare new pond for export-oriented shrimp culture (Chong 1990: 41). In 1984, the Philippines took on new indebtedness for aquaculture, by soliciting a $21.8 million loan from the Asian Development Bank to construct hatcheries and ponds. New

22 These were the San Miguel Corporation, Lim Family Enterprises, and Dole Philippines.

23 Analysis of Philippine Annual Fisheries Profile (1977, 1984, 1988, 1995, 2005).

technologies in seedling hatcheries and formulated commercial feeds permitted the country to move quickly into the development of monocultural shrimp ponds that were jointly financed by the government and private investors (Primavera 1995). Between 1970 and 1990, traditional polycultural operations disappeared, as the hectares in commercial fishponds increased 137 percent (Nickerson 1999). Even though shrimp represented only 10.2 percent of total fishpond production in 1988, shrimp exports accounted for nearly one-fifth of the value of all fishery and aquaculture exports, falling third in significance behind tuna and seaweed.[24] More than 80 percent was being shipped to Japan, the second largest importer being the United States (Philippine Annual Fisheries Profile 2000).

5.2 *Trade Crisis of the 1990s*

By 1994, external debt had skyrocketed to nearly $656 per capita (*Asiamoney Magazine*, March 1996), partially because the government used external loans to finance expansion of shrimp farming. Between 1951 and 1995, the land area re-oriented to fishponds had more than tripled, and about one-third of those ponds were derived from government privatization of public mangroves through its fishpond lease program (Primavera 1995). Through vast exports to Japan and the United States, Philippine export shrimp held its highest value on world markets in the 1980s, reaching its peak in 1989.[25] Even though shrimp farming more than tripled between 1988 and 1995, the Philippines encountered problems with prawn farming to such an extent that it was no longer competitive in the world market by 1995.[26] On the one hand, Philippine shrimp production costs were nearly double the expenses paid by Thai and Indonesian competitors. The shrimp industry was heavily dependent on imported feeds, chemicals and equipment that accounted for 40 percent of operational costs (Krinks 2002: 132). On the other hand, overproduction of shrimp and fish by so many Asian countries led to falling prices. Simply put, world prices crashed in 1989 because the world market was flooded with Chinese shrimp (Chong 1990: 42). Between 1985 and 2003, the Philippines almost quintupled its shrimp exports, but the market value of those exports did not even double (FAO 1995). For the Philippines and many other Asian countries,

24 Analysis of Philippine Annual Fisheries Profile (1988).

25 Primavera (1997: 47) maintains that Philippines shrimp production reached its peak in 1989, then production declined, peaked again in 1992, and subsequently declined steadily. Yap (1999) is convinced that the "shrimp fever" was over in 1989 when prices collapsed and bank lending rates rose to 25 percent.

26 Analysis of annual data in Philippine Annual Fisheries Profile (1984, 1988, 1995, 2000, 2006, 2008).

export-oriented aquaculture became an open door through which ecological resources and financial wealth seeped away. The costs of external loans and of foreign technology and feeds amounted to a net trade imbalance for the Philippines. Shrimp production expanded until 1995, then declined steadily. By 2000, shrimp accounted for a lower proportion of total aquaculture production than had occurred in 1977. In fact, shrimp represented a higher percentage of total export value in 1977 than these shellfish did in 2000.[27]

To cope with its declining aquaculture outputs, the Philippines established its Fishery Sector Program and its Fishery Resource Management Program, using loans from the Asian Development Bank and Japan's Overseas Economic Cooperation Fund (ADB 1999). In 1995, the land reform law was amended to exclude large landowners who operated fishponds. This act of support for the fishpond operators was prompted by the large dollar earnings from shrimp export and the strong competition among neighboring countries (Yap 1999). In 1997, the Agriculture and Fisheries Modernization Act put emergency measures in place to make fisheries more profitable in the face of trade liberalization and international competition.[28] New ponds were necessary because older ponds became unproductive and were abandoned after about a decade. For that reason, 15 percent of leased fishponds were idle in 1998 (ADB 1999: 7). In 2000, the Philippines supplied only 4 percent of world output of shrimp while Thailand and China accounted for 48 percent (Aksoy and Beghin 2005: 277).

5.3 *Aggressive Aquaculture Promotion since 2000*

Shrimp production declined 34 percent between 1995 and 1999, and the country's ranking in aquaculture exports fell precipitously. By 2007, the country was generating 53 percent less shrimp than it had in 1995. In the same time period, aquaculture outputs of exotic finfish (e.g., tilapia) rose.[29] By the late 1990s, it was clear to fishery officials and to university technocrats that the Philippines needed to rethink its aquaculture priorities. Legislation and new funding initiatives started in the late 1990s laid the groundwork for post-2000 directions. The 1998 Fisheries Code permitted holders of fishpond leases to become land owners when their leases expired (Republic of Philippines 1998), cementing large-operator control over aquaculture (Krinks 2002: 131). In 1997, Philippine

27 Analysis of annual data in Philippine Annual Fisheries Profile (1984, 1988, 1995, 2000).

28 That same year, the Department of Environment and Natural Resources banned the use of mangroves for fishpond development (Philippine Annual Fisheries Profile 2003). However, this government agency has never been able to implement this ban or to police violations effectively. Despite the ban, private corporations continued to exploit mangroves for fishpond development (Primavera 2000).

29 Analysis of Philippine Annual Fisheries Profile (2000, 2006, 2008).

capitalists joined with their peers from twelve other countries to form the Global Aquaculture Alliance to protect corporate interests.[30] The Philippine Institute for Development Studies advocated government prioritization of larger fishponds through "attractive government incentives," contending that "large-scale farms have better access to capital, technology resources and have better capability to mass produce" (Platon and Israel 2001: 12–14). The Institute report made seven other significant recommendations that government officials have implemented since 1999, including:

1. the establishment of multi-functional mariculture parks,
2. recruitment of foreign direct investment and joint aquaculture ventures,
3. government incentives for investment in aquaculture expansion,
4. development of strategic agricultural and fisheries development zones,
5. expansion of hatcheries and processing facilities,
6. government-funded research into improved feeds, and
7. use of more genetically-modified species that produce higher yields and/or are more resistant to diseases.

In addition, the Medium-Term Development Plan set the goal of 16,000 new hectares of aquaculture projects by 2010 (Republic of Philippines 2000). To assess the status of aquaculture, the government conducted a 2002 census of fisheries which reported that the number of aquaculture operators grew eightfold since 1980 and that the number of aquafarms had swelled to 8.5 times the 1980 level.[31] There were 123,500 fishponds (52.5 percent of the total), and 90,100 seaweed farms (38.2 percent of the total). The census reflected new remedial directions that expanded in the 1990s, including 10,600 fish cages and pens, 1,800 fish tanks and 758 hatcheries to breed seed fish. The census also documented the growing trend away from problem-ridden brackish water ponds, for nearly 85 percent of fish farms were situated in marine or fresh water. In addition, more than 20,000 farms were engaging in experimental oyster, mussel, crab, and other shellfish (Republic of Philippines 2002).

Why would the Philippines continue to subsidize aquaculture despite the high costs of public programs and imported inputs? Why would the Philippines continue to try to compete with China, Thailand, and Vietnam which account for a majority of the world's aquaculture output (FAO 2012e)? On the one hand, both marine and inland capture fishing are in a state of crisis in the Philippines, evidenced most strongly by declines in tuna fishing– the number one Philippine fishery export for decades. The rest of the world is facing the same

30 https://www.globalseafood.org/aboutgsa/ (accessed 4 Oct. 2021).

31 The 2002 fishery census reported 220,500 operators and 235,400 aquafarms in 2000, compared to 27,300 operators and 28,000 aquafarms in 1980.

dilemma, for "the maximum wild capture fisheries potential from the world's oceans has probably been reached" (FAO 2008d: 7–12). On the other hand, global demand for luxury fish, shellfish, and seaweed has steadily risen. A European Commission study notes that "aquaculture is the fastest growing sector of the world food economy" (Staniford 2002: 1). According to the Food and Agriculture Organization (2008d: 6–17), aquaculture "is set to overtake capture fisheries as a source of food fish." Per capita fish and shellfish consumption is rising in the middle classes in most countries, and US citizens annually consume almost as much fish per capita as the Chinese (McKeown 2008). Despite ecological and production problems all over the world, shrimp still accounts for 31 percent of all supermarket seafood sales in richer countries (Reed and Royales 2014). By 2010, a majority of the world's shrimp was produced by Asian technologies (FAO 2012e).

Reflecting these global food trends, external funding agencies continue to advocate Philippine aquaculture expansion. After the country dropped from fourth to twelfth in global aquaculture rankings, the Food and Agriculture Organization (2004b: 8) recommended that the Philippines undertake deeper integration into the global agro-industrial food regime, advising that: "The future growth of Philippine aquaculture may not be sustained unless new markets are developed, market competitiveness is strengthened and farming risks are reduced. In this age of international trade and competition, the Philippine aquaculture industry needs to plan and implement a development and management plan with a global perspective." In addition to such continuing pressures from international development agencies, the US has broadened its funding of "high-value aquaculture" in the Philippines, especially in Mindanao, around three agro-industrial goals: (a) "expanded production and marketing of lucrative, non-traditional commodities;" (b) establishment of refrigeration methods essential to distant shipping; and (c) "a major expansion of exports to the large and growing China market."[32] To "accelerate economic growth in Mindanao between 2008 and 2012," USAID funded several infrastructure projects, including a seaweed warehouse, seaweed solar dryers, boat landings, port upgrades, road construction, a multi-species hatchery and mariculture park. A new grouper and abalone hatchery was managed by Mega Fishing Corporation, a deep sea purse seine operator that ships canned fish to 22 countries.[33] In 2019, the US Department of Agriculture "Buy USA" website made clear why the US calls attention to aquaculture projects in Mindanao, i.e., "materials and

32 USAID-Philippines website (accessed Jan.–April, 2019).

33 See https://usaidlearninglab.org/library/evaluatinggrowthequitymindanao3program. (accessed 2 Oct. 2021).

hardware are mostly imported." Both the US Embassy Mindanao Initiative and the US Commercial Service structure joint ventures between US and Philippine companies, and many of these partnerships offer American investors a four to six year tax holiday, a low income tax rate, and guaranteed 50 to 75-year leases. Buy USA declared that "Mindanao is the Philippines gateway to opportunity," and it recommended that American businesses export to Mindanao agricultural, aquaculture and food processing machinery, solar power systems, food packaging equipment, refrigeration and cold storage equipment, plastic aquaculture building materials, chemical test kits, and flat-rolled iron. Buy USA claimed that "Mindanao has a strong affinity for US brands," so it also recommended that US farmers export grains and milk to the region. In fact, the Bureau of Fisheries and Aquatic Resources cooperates with USAID to try to expand the use of soy-based feeds in aquaculture. In short, the US presence in Mindanao is intended to develop new markets for US agricultural and industrial products.[34]

Since 2000, the Philippine government has reacted to world demand and to external development agencies to prioritize new export targets. The motivating factors for aquaculture are not local food security, but distant market demand. In the words of one fishery official, "China is still the main export market for high-value seafood such as live grouper, snapper, abalone, and sea cucumber. Frozen tilapia, catfish and pompano are selling well in the US while Japan is a major market for shrimp and crustaceans" (PIA News, 17 September 2008). In 2004, the director of the Bureau of Fisheries and Aquatic Resources announced that aquaculture outputs had grown three times more than farming outputs since 2000, and he pinpointed the explanation for the new surge in fish farming. "Aquaculture has been growing tremendously," he said, because "this sector is the most influenced by government interventions. Aquaculture is really where the growth prospects are as marine culture parks, bangus [milkfish] hatcheries, research on superior tilapia strains, bangus and tilapia fishponds, and seaweed nurseries are being established by the government" (Aguiba 2004). When the Secretary of Agriculture and the Bureau of Fisheries and Aquatic Resources director claimed publicly in 2001 that aquaculture was exhibiting the "biggest growth" of any sector of agriculture (*Asia Pulse*, 8 December 2004), they were overstating the success of shrimp aquaculture. Between 1994 and 2006, the country's agricultural exports increased 34 percent, but fish and shellfish exports declined 27 percent.[35] Moreover, shrimp– the most valuable Philippine aquaculture export commodity– fell 53 percent

34 BuyUSA website (accessed April–July, 2019).

35 Analysis of export-import data, 1994–2006, BAS.

between 1995 and 2007. Between 2000 and 2005, seaweed production dropped 42 percent, and the value of shrimp exports fell nearly 2 percent.[36]

The public rhetoric is intended, no doubt, to legitimate the surge of new programs and subsidies to expand export aquaculture. Because of the decline in shrimp production, the government initiated a new thrust in 2006 "to optimize production in more than 240,000 hectares of brackish water ponds, reinvigorate the shrimp industry and spur development of more than 1,000 hectares of new brackish water fishponds, pens and cages" (*Philippine Star*, 23 July 2006). Since 2000, the largest government investments in aquaculture have been directed toward the construction of forty mariculture parks, 23 of them situated in Mindanao. A typical park is 500 hectares or more, with farm plots for fish cages and seaweed farming. Cages are employed to grow high-value export marine fish, such as grouper, pompano, snapper and Asian sea bass. In addition, these parks permit aqua-polyculture of several compatible species. "The mariculture park concept is similar to an industrial estate where an area in the sea is subdivided into different plots for the farming of fish and other aquatic life. ... Important facilities that entail a large capital outlay, such as storm-resistant mooring systems and other support structures, are set up by the government to encourage investors. The fishcage operators, in turn, would lease an area from their local government" (Philippine Annual Fisheries Profile 2009). According to fishery officials, a sea cage costs 85 percent less to construct and maintain than a small fishpond, but a single fish cage can produce as much as a one-hectare fishpond.[37] Adjacent to the parks are ancillary facilities, such as ice plants, cold storage, canneries, feed mills, and sea cage fabrication (*Agriculture Business Week*, 29 April 2009). Much like a government-funded industrial park in the US, the mariculture park represents an attempt to rationalize the aquaculture production process into a vertically-integrated commodity chain. The goal is "to develop an area with appropriate equipment and infrastructure that will allow fishermen, fish farmers, and investors to operate cost effectively and securely" (Rosario 2006: 9). The government also promoted partnerships with foreign investors to intensify commercial fish cage farming, like the Zamboanga City Mariculture Park (*Manila Bulletin*, 23 February 2008).

In addition to mariculture parks, the government subsidized and promoted infrastructure, technology and new genetically-modified species that they claim will maximize production and accelerate processing. For example, the Bureau of Fisheries and Aquatic Resources distributed experimental fish cages and fish pens (Rosario 2006) and recruited foreign investments for

36 Analysis of Philippine Annual Fisheries Profile (2000, 2006, 2008).

37 A typical fish cage is 10 by 10 by 4 meters.

fishery feed mills in Mindanao (*Minda News*, 30 November 2004). Because crabs are the most expensive seafood in the global market, the government promoted increased outputs of this commodity through mechanisms like aqua-silviculture (mudcrab culture in mangrove pens). Moreover, government funding was allocated to research and development of new hybridized and genetically-modified species that withstand bad water conditions, grow to maturity faster, and insure higher yields. The "new rising star" in Philippine export aquaculture was *Pangasius* (Vietnamese catfish) which is less costly to grow because it can survive diseases and pollution to a much greater degree than other species (*Agriculture Business Week*, 30 July 2008). After Vietnam earned US$1 billion from catfish fillet exports to Europe and the US in 2007, Vitarich Corporation introduced this species to the country and began to market fingerlings and specialized feeds to pond operators (*Mindanao Magazine*, 26 May 2008). Also in high demand in world markets is tilapia, the second new species that was promoted for fishpond re-orientation. The government funded twelve tilapia hatcheries that can cultivate 60 million fingerlings of GET Excel tilapia fingerlings for distribution to commercial fishponds (*Asia Pulse*, 8 December 2004). According to the director of the Bureau of Fisheries and Aquatic Resources, "tilapia production will continue to increase with the conversion of large tracts of land in Northern Mindanao into fishponds in line with the project to promote export of tilapia filets to the US" (Aguiba 2004).

In 2009, the agency's director reported that "the Bureau of Fisheries and Aquatic Resources regards the aquaculture sector as the driver for growth for the overall fisheries production. ... This is why the agency intensifies and promotes the production of several lucrative species." Because of rising global demand and trade value, the Philippines began in 2009 to promote African *hito* and freshwater shrimp, along with other nontraditional fishpond species (Philippine Annual Fisheries Profile 2009, 2010). Geared for the global export market, a new French-engineered tilapia breed can be grown in both fresh and brackish water, making it possible to farm tilapia and shrimp in polycultural ponds. Despite ecological problems, diseases, and fish kills in brackish ponds, the Philippines continues to advocate expansion of these types of fishponds. According to one fishery official, "fish grown in brackish waters compared to fresh water tastes better, the quality is also better, the flesh is darker which is what the market prefers" (Felix 2006). By 2005, tilapia accounted for 18 percent of the country's aquaculture production, showing rapid expansion in a few years (Philippine Annual Fisheries Profile 2006). Because it matures faster, requires less production inputs, and has strong resistance to diseases, fishery officials were convinced that Thailand's genetically-modified white freshwater shrimp will salvage the Philippine shrimp industry. In 2007, the Philippines

produced 30,000 metric tons of white shrimp while pond operators grew only 24,000 metric tons of the indigenous black tiger prawn that originally spurred the country's shrimp industry. "Traditional farming methods no longer suffice," a fishery official contended. "An export-oriented industry such as this requires more technology-intensive practices." Consequently, the government underwrote seven white shrimp breeding and larval rearing hatcheries, plus 38 experimental farms. The government also promotes the generation of genetically-modified versions of the local *sugpo* and tiger prawn, accompanied by intensified research to enable the industry in these varieties "to survive competition in the world market."[38] However, none of these approaches overcame the most fundamental weakness of Philippine aquaculture: the heavy dependence on imported chemicals, technologies, and modified species (FAO 2004b: 3).

Because the island produces 42 percent of the country's seafoods, Mindanao was targeted for an intense new phase of aquaculture expansion after 2000 (Menguita-Feranil 2007: 4, *Mindanao Magazine*, 20 January 2009). According to a Philippine Chamber of Commerce representative, "Aquaculture production in Mindanao offers opportunities for growth. With a variety of species available, Mindanao is an ideal location for mariculture activities due to its large production areas and year-round fish production" (PIA News, 17 September 2008). Because 43 percent of the country's aquaculture production occurs here (Menguita-Feranil 2007: 3), government funds were earmarked for "realizing Mindanao's aquaculture and mariculture potentials." To move fish to market as quickly as possible, the government developed a "mariculture highway" system that connects Mindanao aquaculture facilities to ports, in order to "enable the country to be an important player in the live food-fish export market" (Philippine Annual Fisheries Profile 2009). Much of the attention is aimed at moving foods more quickly and more safely to the National Capital Region, so the government developed a food logistics system to deliver the island's surpluses to Manila (Balane 2009). "We have a food security problem," the Secretary of Agriculture told the Third Aquaculture Congress in Mindanao. "So we need you to ship more of your products, and we need your food to help feed the 15 million people of Metro Manila" (*Minda News*, 30 November 2004). At the Sixth Philippine Food Congress, the President of Cruz Aquaculture told reporters, "Mindanao can increase its aquaculture production and can further compete with other Southeast Asian countries since it has promising resources that can boost its growth. Aquaculture is the fastest growing sector of agriculture, and by 2017, the sector is projected to overtake the capture fishing

38 BFAR News 1 (3) (2008).

sector. We can have better production because we have big territorial waters" (Sevilla 2007: 4). Mindanao was expected to triple exports of seaweed, carrageenan, and other aquaculture products to China by 2015.[39] To meet this goal, the government undertook several infrastructure strategies. Twenty processing plants were added in Mindanao, including eight canneries that can process 300 metric tons daily (*Mindanao Magazine*, 20 April 2009). In addition, new cold chain infrastructure was developed in southern and northern Mindanao (*Warehousing World*, 1 July 2006).

5.4 *Seaweed Farming*

Despite all the attention to fish farming, seaweed is the fishery commodity that has the most consistent track record. In terms of global trade value, seaweed represents the country's second most profitable fishery export, following tuna. World and national demand for seaweed has remained high since 1977, and seaweed prices have been less volatile than the prices of fish and shellfish. Between 1980 and 2003, most of the increased production in Philippine aquaculture came from seaweed outputs (Barut 2004). While shrimp production declined 53 percent between 1995 and 2007, seaweed production increased. There were 73,549 seaweed farmers in 2002, representing 22.7 times more operators than existed in 1980.[40] Following the decline in shrimp production, the Philippines prioritized expansion of seaweed production, and this type of mariculture increased 160 percent between 1995 and 2007.[41]

Unlike food fads in fish and shellfish that change erratically, seaweed has been developed into a wide array of industrial and health uses around the world (*Manila Bulletin*, 17 April 2008). The need for durable foods in the global agro-industrial food regime stimulated world demand for colloids like carrageenan. Seaweed farming of the Euchema species originated in the southern Philippines in the mid-1960s under the auspices of the American-based Marine Colloids, Inc., the world's largest carrageenan processing company, which had exploited Canada's Irish Moss from the 1940s until the 1970s. By early 1970s, the corporation had selected the Philippines as the most ideal area for mass cultivation of seaweed. By 1978, Philippine production had unseated Canada as the world's top producer of seaweeds (Blanchetti-Revelli 1995: 108–10). Since then, the Philippines has been one of the world's largest producers of seaweed and its by-product, carrageenan (Philippine Annual Fisheries Profile 2009–2015).

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39 USAID-Philippines website (accessed Jan.–April, 2019).

40 Analysis of Philippine 2002 Census of Fisheries, OpenSTAT.

41 Analysis of fishery data, 1992–2008, BAS. Analysis of Philippine Annual Fisheries Profile (2000, 2006, 2008).

In 2000, seaweed comprised two-thirds of the metric tons of aquaculture exports, but the lowered production of shrimp still netted a far higher total export value (Philippine Annual Fisheries Profile 2000). The greatest demand for Philippine seaweed exports comes from China, the United States, France, Great Britain, and Germany. Because seaweed farming does not require capital-intensive technology, at least 500,000 farmers are involved in its cultivation. While Western Mindanao supplies 70 percent of the country's output, every province of the Philippines is involved in seaweed production. In the late 1990s, there were eleven locally-owned and four foreign-owned carrageenan refining plants in the country, employing 12,000 full time workers (SIAP 1996). Although there are fourteen carrageenan processing plants in the Philippines (*Agriculture Business Week,* 7 March 2009), Mindanao-based Shemberg Corporation is the largest carrageenan producer in the world (Cruz 2008), supplying one-third of global demand (*Manila Bulletin*, 6 November 2005).

However, this agro-industry is showing signs of crisis. Production expanded steadily between 1977 and 1999, then declined between 2000 and 2005. Pollution and diseases periodically lower production levels (Rosario 2006: 4–5). Since 2000, seaweed production has dropped nearly 43 percent but the value of exports rose nearly 9 percent, reflecting the increased Chinese demand for dried seaweeds.[42] In the face of shortfalls and high global demand, Philippine processing plants have experienced raw material shortages, sometimes importing from Indonesia and Malaysia to produce carrageenan for export. After 2006, Indonesia produced seaweed at lower costs, threatening Philippine competitiveness in the world. Seedlings represent 26 percent of Philippine production cost, but only 8 percent of Indonesian costs (Cruz 2008). To try to overcome these shortfalls, the government enlarged its funding base to provide more loans for seaweed farms (Philippine Annual Fisheries Profile 2009), sought foreign investors (*Fresh Plaza*, 8 June 2009) and promoted new technologies, including 297 seaweed nurseries and solar dryers (Aguiba 2004). Through a grant from Japan, Philippine universities have developed a seaweed gene bank and new strains of high-yielding, fast-growing seaweed (*Manila Bulletin*, 29 April 2007).

6 Ecological Impacts of the Philippine Agro-Industrial Export Strategy

Through such export intensification strategies, the Philippines has pushed its resources to the crisis stage to supply a majority of its fishery exports to the

42 Analysis of Philippine Annual Fisheries Profile (1977, 1984, 1988, 1995, 2000, 2006).

United States, the European Union and Japan (FAO 2012d). By 2020, the ecological footprint of the Philippines was 2.2 times greater than its biocapacity (see Figure 10). A Philippine academic encapsulated the government mindset this way: "There's a resource waiting to be tapped. Are you going to exploit it, or are you just going to let it sit there?" (Goldoftas 2006: 130). Through such narrow thinking, the Philippines has squandered valuable ecological resources that are needed for domestic food production. "These policies encouraged resource extraction and disinvestment in the primary production sector, which reduced sustainable yields from natural resources. Resource depreciation in just three sectors– forestry, soils, and coastal fisheries– averaged more than 4 percent of GDP from 1970–87 and 20 percent of gross investment" (Cruz and Repetto 1992: 2–3).

6.1 *Land and Forest Degradation*

The country's farm lands are at risk from industrial encroachment, from aquaculture effluents, and from the waste generated by human settlements. Only about 7 percent of the households are connected to sewer systems, and the country generates 2.2 million tons of organic pollution every year (World Bank Philippines 2003). Total farm land area has expanded very little since 1995, exacerbating the pressure on small farmers. "Unfavorable market integration, high levels of surplus extraction, and policies that engender indebtedness have double consequences. Not only do they perpetuate poverty and underdevelopment, but the strategies that smallholders adopt to insure their survival under such circumstances are frequently incompatible with sustained, environmentally appropriate land use and lead to deterioration of ... natural resources" (Collins 1987: 19–20). The government has subsidized use of fertilizers, pesticides, herbicides and other agricultural chemicals, and the intensification of production has taken its toll on farm lands. For example, banana production requires 30 milligrams of chemicals per hectare annually, a level that is ten times the average for intensive agriculture in richer countries. One ton of bananas generates two tons of waste that is contaminated with chemicals and plastic. Banana plantations aerially spray fungicides forty times per year and herbicides eight to twelve times a year, and they utilize massive amounts of disinfectants after harvest. In addition, copper and other the residues sterilize the soil, leading to erosion (*New Internationalist* 1999a).

Nationally, such practices in all types of crops have left nearly 46 percent of hectares moderately to severely eroded (Domingo 2001). "The global agrofood system relies heavily on inorganic nitrogenous fertilizers. ... Nutrient export through long-distance transport of crops...depletes soil nitrogen at rates exceeding the capacity for biological regeneration" (Mancus 2007: 269–71). To

complicate matters, prime agricultural land has been converted into fishponds, industrial areas, tourism facilities or human settlements. In addition, salt-water contamination by adjacent brackish fishponds has made agricultural land barren (Primavera 1997). Pollution and runoff from tourism facilities, livestock, poultry, fertilizer, pesticides and decaying plant matter endanger coastal lands and waters. The expansion of corn production has had far worse ecological impacts than most crops. Upland agricultural areas were diverted from tree crops to corn, generating massive erosion and new flooding problems on steep sloping lands. Sand and gravel mining are common activities in coastal areas, and land-based mining is a major source of pollution, especially in Mindanao (World Bank Philippines 2003).

In the 1980s, the Philippines exhibited the most rapid deforestation in the world, as mangroves shrunk to one-third of their 1900 level (Anderson 1987, Cruz and Repetto 1992: 23). After 2000, deforestation occurred at the rate of 227,000 hectares yearly (World Bank Philippines 2003). Between 1951 and 1990, the country lost two-thirds of its mangroves, more than half those losses caused by deforestation for fishpond construction (McGinn 1998). Mindanao was deforested at a rate that exceeded the rest of the country, so it lost more than three-quarters of its mangroves (Primavera 1995: 304).

6.2 *Degradation Caused by Capture Fishing*

Capture fishing has taken a serious ecological toll on the country. Fishery resources are more depleted in the Philippines than most other Asian countries. The Philippine fish catch is among the highest 10 percent of countries in the world, so fish are harvested at a level 30 to 50 percent higher than the natural production capacity. A majority of the country's coastal and inland waters are over-fished, and many of its 1970s species have been depleted (World Bank Philippines 2003). By the late 1990s, stocks of bottom-dwelling fish were less than one-third of their 1940s levels (ADB 1996: 35). About 80 percent of the country's coral reefs are severely damaged, fifty of the country's 421 rivers are dead and many lakes are ecologically endangered (World Bank Philippines 2003). Export pressures on coastal fisheries are probably greater than parallel exploitation of other types of ecosystems. "Increasing foreign and domestic demand for coastal and marine products led to huge capital inputs which transformed fisheries technology. ... Overexploitation stressed the fisheries resources beyond their reproductive capacities" (Anderson 1987: 261).

Commercial fishing vessels cause far more resource depletion than peasant fishers, as is evidenced by the threats to tuna stocks. After 2000, tuna exports increased more than any other trade commodity, outputs doubling over

mid-1990s levels.[43] Tuna is in a state of crisis worldwide, and this fishing sector is also in crisis in the Philippines. Since 2008, catches have declined sharply, resulting in massive unemployment in both fishing and ancillary industries. Global warming will continue to impact the Philippine tuna shortage, as these species alter their migration patterns to move to cooler waters (Jacinto et al. 2015; Macusi et al. 2021). While the quantity of exported tuna far exceeded any other species in 2007, the value of shrimp, crabs, lobster, octopus, and squid– seafoods that are delicacies in Japan, Europe and the US–far outpaced the export value of tuna.[44] The demand for scarce luxury fish has driven more intensive capture fishing for these rarer species since the mid-1990s, so they are also becoming depleted. For example, the average daily catch of blue crabs– the world's most expensive crustacean for export to Japan, the US and China– is less than half what it was in the 1990s ("Philippines Blue Crabs" 2002).

6.3 *Degradation Caused by Aquaculture*

In every peripheral country where aquaculture has been prioritized, "satisfying the huge export market for cultivated fish and shellfish has led to significant environmental damage" (Aksoy and Beghin 2005: 277). The core can pay cheap prices for peripheral fish and marine resources because most of the real costs of production are externalized to Asian ecosystems and communities. In Asian countries, aquaculture has been accompanied by land seizures, privatization of commons (especially mangroves) and the displacement of tens of thousands of people. To make way for fishponds, Philippine mangroves have been destroyed to such an extent that only a tiny percentage of the original forest cover remains. Renowned Philippine scholar Jurgenne Primavera (2000: 99) observes that "an aerial view of the Philippine coastline will show a monotonous succession of fish ponds with hardly a relief of green." Furthermore, fish farming has led to dwindling fish stocks, damaged and reduced crop areas, endangered traditional peasant activities and eroded household income (Cabanilla 1997: 10).

More than 400 plant and animal species found in the Philippines are threatened with extinction (World Bank Philippines 2003). Monocultural fish and seaweed farms have caused loss of biodiversity, eliminating hundreds of fish, crustaceans, mollusks, and grass species. First, aquaculture ponds engage in mass monocultural production, using up the space that was once occupied by hundreds of different species. Second, that export species must devour high

43 Analysis of Philippine 2002 Census of Fisheries, OpenSTAT.

44 Calculated from Philippine Annual Fisheries Profile (2008). The total export value reflects the free-on-board value of all fresh and processed seafood in each category.

levels of smaller adjacent species if it is to be produced at high export levels. For instance, 36 million tons of wild fish is needed to produce 7.2 million tons of shrimp (Primavera 2000). Third, fishponds threaten the country's safe water supply. On the one hand, "overextraction of ground water for prawn farms has caused shallow wells, orchards and ricelands to dry up, and land to subside and saltwater to intrude from the sea" (Wilks 1995: 122). On the other hand, fishponds cause salinization and contamination of drinking water (Environmental Justice Foundation 2003: 10).

Fourth, escapes of genetically-modified fish can invade and displace the gene pool of wild fish (Emerson 1999). Fifth, fishpond waste builds up as silt and sedimentation in rivers, bays, and along coasts, "risking all the animals and threatening the livelihoods and living conditions of humans" (McGinn 1998).

> Shrimp farming requires four to six tons of feed per hectare. Only 17 percent of this feed is converted into shrimp biomass. The rest becomes waste, heavily contaminated with pesticides and antibiotics, which is flushed directly back into the sea or onto neighboring mangrove and agricultural lands. The shrimp pond is then refilled with new sea water. The high level of pollution resulting from this open drainage of effluents into both irrigation channels and the sea has resulted in fish mortality, the contamination of groundwaters, and various health hazards. (Shiva 2000: 46)

Loaded with antibiotics, pesticides and other chemicals, the waste builds up as sedimentation to lower depth of waterways, and it smothers coral reefs and seagrass. It also triggers harmful algae blooms and can cause the emergence of resistant new strains of pathogens (Primavera 1991).

While the Philippine government advocates the expansion of fish farming in cages and pens because it is less ecologically harmful than fishponds (Philippine Annual Fisheries Profile 2008), that claim is not supported by research. Fish cage farming is incompatible with fishery sustainability (Pauly 2002). Worldwide, fish farming in cages or pens requires three tons of wild fish to produce every ton of trade fish (Staniford 2002). In the Philippines, each caged fingerling is fed five kilograms of mixed wild fish, fishmeal and grain over six months (Espejo 2005), a rate that exceeds world averages. The ecological footprint of every cage or pen is the size of a football field. For example, farmed tilapia needs a spatial ecosystem support that is 10,000 times larger than the cage (Kautsky et al. 1997). For every ton of fish produced, one ton of organic waste accumulates on the ocean or bay floor (Rosario 2006). The release of nutrients from the sediment triggers growth of algae and the release of toxic levels of hydrogen sulfide

(Giles 2008). About 49,000 tons of fish farmed in cages contributes as much nitrogen as the untreated sewage from 682,000 people (Pendleton et al. 2005). The presence of these nutrients causes eutrophication or the development of toxic algae blooms that threaten wild fish species and coral reefs (Nixon 1995). Cages and pens also introduce toxic chemicals into the water, including pesticides and residues of copper, zinc and cadmium from cage materials (Naish and Shearer 2002; Dean et al. 2007). Fish cage farming "presents insurmountable problems in terms of mass escapes, infectious diseases, parasite infestation, the reliance on toxic chemicals, contamination of seabed and the bioaccumulation of pesticides such as dioxins and PCBs" (Staniford 2002: 2). Fish cages have had a devastating impact on many Philippine inland waterways (ADB 1999: 17), including massive cluttering that makes it hard for boats to navigate them. At Laguna de Bay, fish cage farming has caused decay of what was once the country's most scenic inland water system (Espejo 2005). Even though it is a natural protected area, the country's third largest lake is murky and foul-smelling due to algae blooms and chemical load that have resulted from waste that has accumulated from nearly 10,000 fish cages. Because the legally-protected fish sanctuaries in Taal Lake are occupied by fish cages, four of its seven endemic species are at risk of extinction. Some waterways are so polluted that massive fish kills occur regularly (Luistro 2007, 2008).

Even though it is far more sustainable than export-oriented fishponds or cage production, seaweed farming is not without ecological shortcomings (*Japan Times* 2020). Seaweed farms require poles and stakes from mangroves, and they threaten coral reefs when they are constructed near or above them. Abandoned farm gear, lines and plastic bottles litter the ocean floor, coral reefs, and surface water (Sievanen et al. 2005). Since it is monocultural, seaweed farming threatens plant and grass diversity along coasts, and genetically-modified strains rapidly explode and destroy biodiversity (Lindstrom 2004). Seaweed is cultivated in tightly-packed parcels, changing the feeding habits of snails, oysters, and small fish that naturally utilize sea grasses and plants as their habitat. Seaweed farmers limit the mollusk populations that normally feed around such plants, disturbing their natural habitats and threatening their survival (Feng 2004). Toxic substances, such as ammonia and arsenic, are excreted at unnaturally high levels by seaweed farms, causing small mollusks and snails to move out of these areas (Radford 2002). There is also evidence that seaweed farmers utilize pesticides that get absorbed at high levels by seaweed (US Food and Drug Administration 1994: 17). In the Pacific Rim where seaweed is part of the human diet, poisonings were common throughout the 1990s, and hospitals pointed to pesticides as the causative agents (Vincent and Guibal 2014: 4340).

According to the Royal Swedish Academy of Sciences, "years of experience with intensified systems have not led to sustainable solutions," and new technologies "are unlikely to lead to a sustainable industry" (Lebel et al. 2002: 311). A European Commission (2002: 17) study contends that "infectious disease poses the biggest single threat to aquaculture." Because of the growing organized political opposition to aquaculture in the US, Canada and Europe, these richer countries will increasingly externalize the ecological costs of these production processes to Asian countries where there are weak monitoring and enforcement capabilities (Platon and Israel 2001: 12).[45]

7 Looking to the Future

It is not likely that the Philippines will change direction in the early 21st century. However, the Philippine government cannot claim ignorance of the environmental costs of the export agenda it has grounded in exploitation of natural resources. In one of its training manuals, the Bureau of Fisheries and Aquatic Resources (2007) warns local governments about an extensive catalog of ecological impacts from aquaculture. Moreover, the country's Medium-Term Development Plan acknowledges the threatened state of ecological resources. The country's coastal and inland waterways have been severely degraded, reducing their capacity to provide vital ecological services and economic benefits. Nationally, six river systems are biologically dead, and nearly half of all agricultural land suffers from moderate to severe erosion. Despite the recognition of the Medium-Term Plan that forests, lands and watersheds are endangered, the government's goals for the first two decades of the 21st century are to "increase production intensity," to cultivate all "idle and marginal lands," to "identify hectares of forestlands" to be exploited for logging and livestock foraging, to intensity fishery production in "idle off-shore and inland waters," and "to increase aquaculture productivity" (Republic of Philippines 2000: Chs. 1 and 2). By 2019, the Philippines was an Asian aquaculture anomaly because the country had developed one hectare of fishponds to every 1.4 hectares of cropland. The countries that came closest to this distorted Philippine ratio were Vietnam (1 to 7.5 ratio) and South Korea (1 to 12 ratio). According to Bello and Dorcena (2004: 222),

45 For examples of organized opposition in richer countries, see www.watershed-watch.org, www.ecotrust.org, www.factoryfarm.org, and www.davidsuzuki.org.

> less destructive development approaches have been repeatedly eroded by the government's consistent commitment to neoliberal economic policies...and subverted by the power of narrow economic interests. On the one hand, the government passed– but failed to meaningfully enforce– laws to protect natural resources. On the other, it encouraged– and strongly promoted– the exploitation of these resources by giving investors unhampered access and allowing them unfettered operations.

In 2017, two antithetical public documents were published in the Philippines to propose reforms of national macroeconomic policies: the national mid-century development plan and recommendations to reform national anti-poverty policy. By 2040, the National Economic and Development Authority (2017) claims," the Philippines shall be a prosperous, predominantly middle-class society where no one is poor."[46] Even though this document does not examine food security, it claims that real per capita income will be tripled, eradicating unemployment, poverty and hunger. For those farmers and fisherfolk who produce food, the plan prioritizes strategies to further strengthen exporting, replicating the goals of previous plans that have led to the class inequalities and ecological damage that Bello and Dorcena (2004: 222) criticize, including:

1. innovation, expansion and diversification in high value export crops and fishery species, accompanied by new "production and marketing schemes;"
2. increased access of farmers and fishers to global commodity chains;
3. increased access of farmers and fishers to financing and insurance;
4. increased capacity of farmers and fishers to employ new technologies; and
5. the reclassification of agricultural lands for other uses.

These economic agendas are set alongside the goal of promoting sustainable ecological policies and approaches. In order to implement its "strategic external trade policy regime," the Development Authority recommends pursuit of trade partnerships and new markets and intensified promotion of Philippine goods and services. The plan calls for a "new national competition policy" that will "steer regulations and administrative procedures of government agencies toward promotion of competition" (PNEDA 2017: 11–20, 34–38, 48).

The National Anti-Poverty Secretariat (PNAPC) describes the state of the Philippine economy quite differently, emphasizing that more than one-fifth of the country's population is in extreme poverty while half to three-fifths live

46 This is an impossible exaggeration that is not made by the rich western countries where far less poverty exists.

in varying conditions of deprivation and vulnerability. When set alongside the PNEDA plan, the PNAPC points to the ways in which the new development plan replicates the policies of the neoliberal past and will continue the country's inequitable, low-paying job structure which is grounded in a large informal sector and reliance on the remittances of transnational laborers. Between 1980 and 2016, the GDP per capita barely increased, and was only about one-quarter of the GDP Per capita of East Asia.

The Anti-Poverty Secretariat contends that:

> Poor development performance is due to liberalization and market-oriented reforms since the 1980s. ... Agriculture and manufacturing have declined rapidly and the availability of decent work has, correspondingly, greatly decreased. ... Liberalization has resulted in a weaker service-oriented economy. ... The economy has deindustrialized despite large foreign investments in manufacturing exports. ... The government's capacity to invest in education, health, housing, and infrastructure has been weakened by foregone revenues from tariff cuts and excessive fiscal incentives.

Why have such policies persisted, and why are they likely to continue into the future? The first answer lies in the point where this chapter began, i.e., the vicious circle of debt to fund development of export agendas that generate more debt and more exploitation of natural resources. The second answers in the oligarchal structure of the enterprises that have benefitted most from the country's neoliberal economic goals (PNAPC 2017: 3, 8, 15, 19). Philippine policy formation

> over-prioritizes foreign investors and organized domestic business interests. Robust ties between political and business elites inhibit more aggressive policies for poverty reduction. ... Elites still exert a powerful influence on the electoral system and governance structures, which, as a result, become guided by privileged interests rather than the broader social and public concerns. Short-term profits also tend to prevail over strategic long-term economic development. Clientilism and elite capture of economic policy-making hinder policies that remove imbalance in power relationships. ... The tendency is for policies and laws to favor oligarchs of foreign capitals in general and, often, specific business interests. (PNAPC 2017: 3)

CHAPTER 3

Globalized Food and Asian Hunger

The Philippine Case

Abstract

By exploring threats to Philippine food security, we pinpoint three development policies that threaten Asian food security: (1) state privileging of food exporting over domestic consumption, (2) increasing dependence on imports, and (3) transformation of human dietary staples into nonfoods. While millions of tons of foods flow out of the country, a large segment of the Philippine population is unable to afford seafoods, vegetables, nuts, fruits and cooking oils. At least one-third of the Philippine population is chronically malnourished, and deficiencies are spread through the ranks of most of the middle class and a majority of women.

> Today, the status of the Philippines as a food importer is implicitly accepted by a government that does not see agriculture playing a key role in the country's economic development, except perhaps to serve as a site for plantations rented out to foreign interests to produce agrifuels and food dedicated for export.
>
> (MARIA BAVIERA AND WALDEN BELLO 2009: 23)

In the early 1990s, only 9 percent of Philippine households were assessed to be malnourished. By the early 21st century, hunger has worsened as the country has become more deeply committed to agro-industrial exporting.[1] In 2008, the Philippines ranked fifth in the world for the proportion of people going hungry when 40 percent of surveyed people reported that they lacked sufficient food in the previous year (*Asia News*, 6 November 2008). In 2010, the Food and Agriculture Organization (2011a) classified the Philippines a low-income food-deficit country because it had a per capita gross national income of less

1 Throughout this chapter, all monetary values were standardized at the exchange rate to $US.

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than $1,855 and a net negative food trade position in which imports exceed exports. While millions of tons of foods flowed out of the country, a large segment of the Philippine population was unable to afford the two central dietary elements– rice and fish. Per capita food consumption steadily declined between 1990 and 2019, so that at least one-third of the population was chronically malnourished. A majority of people lacked adequate levels of proteins, fruits, green vegetables, and healthy fats and oils in their diets. By 2019, the typical household diet was rice, boiled fish and a little vegetable, a menu that is 74 percent carbohydrates, less than 10 percent protein, and 17 percent fat. Consequently, deficiencies of iron, iodine, calcium and Vitamin A are common. Between 2000 and 2019, sixty percent of the population suffered shortfalls of crucial micronutrients, such as iodine, Vitamin A and iron. Only about half of households had access to adequate intake of protein, natural starchy foods, and/or healthy fats and oils, so a high proportion of people suffer from dietary energy insufficiency. Iron deficiency anemia afflicts more age groups and is more prevalent than any other nutritional deficiency, and it disproportionately impacts children and pregnant women. Indeed, 57 percent of infants, 51 percent of pregnant women, and nearly half of lactating women are anemic. At least one-third of pregnant women suffer from iodine deficiency, the primary cause globally of mental retardation of children. Hunger and malnutrition are worst in rural areas, and the highest incidence is experienced by the small farmers and fishers.[2]

Why is there so much hunger and malnutrition in a country that exports so much food and fish? International development agencies and the Philippine government have redirected the blame for the country's malnutrition from export strategies to population growth (Constantino 1988: 57). For example, one government report claims that "with the increasing population, the government has to choose between food security/sustainability vs. environmental protection/conservation" (Philippine Annual Fisheries Profile 2006). On the one hand, this myth is countered by empirical evidence. In most years, annual increases in food production have exceeded annual population growth rates. In 2010, for example, population grew 1.8 percent while food production increased 2.2 percent.[3] On the other hand, such Malthusian perspectives are incorrect because there is no cause and effect relationship between population growth and economic or social outcomes (Neiland and Bene 2004: 77). Malaysia, Philippines and Thailand have exhibited about the same population growth rates, but there has been far greater economic growth in Malaysia and

2 Analysis of Philippine National Nutritional Survey (1994, 2000, 2019).

3 Analysis of population and food production data, World Development Indicators Database.

Thailand that exhibit lower undernutrition rates (FAO 2012e). Furthermore, richer countries with the lowest population growth rates consume most of the world's food. Counter to Malthusian claims about linkages between population growth and development status, nearly one-fifth of American children experience hunger even though this country produces food surpluses and exhibits low population growth. Two trends account for food insecurity. First, food insecure countries like the Philippines export many of their most nutritious foods at high levels and redirect resources into nonfood uses. By 2015, Philippine agriculture accounted for only 12 percent of GDP, reflecting the declining global value of the country's crop and fishery exports (Bello and Dorcena 2004). In the words of Philippine rural sociologist Gelia Castillo (1995: 615), the national government has treated rural development as "passe," leading to nationwide "agricultural fatigue," except in targeted export crops and fish. Second, there is less food for the poor because higher incomes of the middles classes and elites allow them to consume at levels well above the requirements for health and survival (ESCAP 2010: 31). Nobel Prize winner Amartya Sen (1981: 154–55), who is probably more renowned than any other scholar for researching the relationship between population growth and food shortages, explains that: "a person's ability to command food...depends on the entitlement relations that govern possession and use in that society." Thus access to food "depends on what [the household] owns...and what is taken away from [it]."

Consequently, malnutrition is a problem of unequal access to available food in the Philippines (Librero and Rola 1991). On the one hand, production of food crops is driven by export agendas, not by goals aimed at making the country food self-sufficient. For a large proportion of the population, local food availability has declined due to export priorities while import prices are out of financial reach of many households. On the other hand, the public policies that govern people's access to, control over, and distribution of resources determine whether a household will receive sufficient basic food requirements. In 2007, the Philippines experienced a 9.5 percent rice deficit that could have been avoided. Nearly 41 percent of crop production was not available for domestic consumption because it was diverted to animal feeds, exported, lost in the milling process or reserved for seed. Consequently, the country experienced a food shortfall of nearly 1 million metric tons of rice. In similar fashion, there was a 66 percent shortfall in fishery products that year, as the country prioritized export of the most nutritious fish and shellfish and diverted wild fish into aquaculture and livestock feed (see Table 3). This trade represented a *nutritional unequal exchange* in which the country exported high-protein and iron-rich foods in exchange for lower-protein foods and low/no-iron seafoods.

Through trade, the country experienced a 43 percent local consumption loss in high-iron crustaceans and mollusks for which it substituted imports of less nutritious fish and meats. In this way, trade generates the country's food deficits in protein, iron and other micronutrients derived from fishery products.

In the sections that follow, we will explore five trade strategies that threaten Philippine food security into the 21st century:

1. state privileging of agro-industrial exporting over domestic consumption,
2. increasing dependence on imported agricultural and aquaculture inputs,
3. rising food importation,
4. privileging nonfoods over human dietary staples,
5. and access inequalities caused by class polarization and elite power.

1 Privileging Exports over Local Consumption

Despite its hunger and malnutrition problems, the Philippines exported nearly 5 million metric tons of food in 2010, nearly doubling its average exports between 1994 and 2005.[4] Since foodstuffs represented 85 percent of the value of all exported agricultural commodities in 2010, the country exported 52 kilograms per capita of food crops and fishery products.[5] After exports are taken into account, the Philippines suffered a shortfall of 6 kilograms per capita in high protein crops and 19 kilograms per capita of vegetables and fruits (see Table 4). As Philippine scholar Cecilia Florencio (1989: 77) has observed, domestic consumption is "sacrificed for exports," so "the Philippines is becoming more and more a vegetable plot, a fishpond, and a fruit orchard for more affluent countries." In most poor countries undergoing trade liberalization, there is a marked inverse relationship between primary exports and domestic food availability. "The present high real incomes of the populations of advanced countries are substantially dependent on the physical availability, through uninterrupted import, of a large range of cheap primary products. ... The effective demand of the world's rich, with its own specific commodity structure, acts like a powerful magnet, restructuring the cropping patterns and resource use in all developing countries that liberalize their trade" (Ghosh and Chandrasekha 2003: 260). Even as the national incidence of malnutrition rises, these countries export increasing amounts of foodstuffs.

4 Analysis of exports, UN COMTRADE database.

5 Analysis of export quantities, UN COMTRADE database, then converted to per capita using Philippine population data.

Thus, national privileging of exports threatens Philippine food security. Trade liberalization opened the country's agriculture to the external demands of distant consumers, effectively putting them in competition with domestic consumers (Ghosh and Chandrasekha 2003: 268). "Acreage devoted to rice steadily declined over the years while cash crops for export expanded. ... Commercial crops practically monopolize government funds and services for agricultural programs and get priority in the use of irrigation, farm machinery, fertilizers and pesticides. The result is a boom in export crops but stagnation or even deterioration in food crop production" (Constantino 1988: 8–10). Despite continuing grain shortfalls, there has been a trend toward "increasing instances of conversion of rice farms to commercial uses and conversion of crops from rice to export winners" (Illo and Pineda-Ofreneo 2002: 47). In fact, the government is diverting more lands to export crops by subsidizing expanded production of bananas, pineapples, coffee, asparagus, mango and papaya through its High Value Commercial Crops Program (PDA 2008).

Four threats to food security have resulted from these export goals.

1. Export species have been prioritized by diminishing crops and fish for domestic consumption.
2. Traditional foods are increasingly being transformed into nonfoods for export or to produce livestock, pet and aquaculture feeds.
3. Nonfood export crops are prioritized over food crops for domestic consumption.
4. The country has become dependent upon expensive imported inputs for production of farm crops, fish and livestock.

1.1 *Privileging Exports over Crops for Local Consumption*

In 2010, less than 0.3 percent of the country's agricultural outputs were high iron/protein foods. If meat and poultry production are taken into account, high iron/protein foods comprise only 2.5 percent of all agricultural production (see Table 5). Despite serious nutritional shortfalls, 89 percent of all tons of agricultural output consisted of nonfood crops for export, i.e., tobacco, rubber, floricultural commodities, and coffee (see Table 8). For most households, rice represents one-third of the dietary intake, but poor rural households consume as much as two-thirds of their calories in this cereal (David and Balisacan 1995). Even though it is so central to domestic consumption, this grain has not been prioritized in farm land use. In 2009, rice accounted for less than 3 percent of total crop production.[6] Nearly one-half of the country's farm

6 Aggregation and analysis of crop production, FAO (2010).

land is planted in three crop monocultures: coconuts and bananas (which are prized as "high value exports") and corn (which provides feed for fish and livestock and raw materials for biofuel production). Between 1980 and 2008, rice lands declined 17.5 percent. On the one hand, total farm land expanded only 2 percent between 1995 and 2008 when the national government prioritized export crops. On the other hand, the agrarian reform program had anti-peasant outcomes (Putzel 1982; Carranza and Mato 2006; Borras 2007; Borras et al. 2007). Rice lands were lost because large landowners were allowed to shield their holdings from redistribution by shifting them to fishponds, government targeted export crops or livestock pastures (Republic of Philippines 1995).[7] As a result of exemptions, 509,550 hectares of ricelands and 29 percent of vegetable and root croplands were converted to fishponds and targeted export crops between 1988 and 1999 (Domingo 2001). One of the first land conversions occurred during the export "shrimp fever" of the 1980s (Primavera 1997: 820). Even though rice is the central food for domestic consumption, state policies have de-emphasized it because it does not generate foreign exchange. In its 1992 national development plan (Republic of Philippines 1992), the government prioritized the conversion of more than 3 million rice and corn hectares to export crops. The official rationale is that a shrimp crop may earn up to 30 times the profits of rice farming because almost all the prawn are exported.

In its subsequent Medium-Term Development Plan (Republic of Philippines 2000: 29–33), the government called for the transformation of 2 million additional hectares into agribusiness plantations. Rice production is glaringly absent from these policies. In 2005, less than one-third of farm land was being used to cultivate rice while the other two-thirds were being utilized to produce export and nonfood crops. Rice hectares are further threatened because these targets exceed the available farm land and will require conversion of lands that have been growing this grain.[8] Since 1992, these national globalization agendas have triggered land conversions, both legal and illegal. Since 2000, croplands or cattle pastures have displaced several traditional rice terraces (*Taipei Times*, 16 June 2005), and 40,000 hectares of ricelands were converted for government-approved ecotourism (*Bulatlat*, 19 February 2006). Rice disappeared from another 45,000 rice hectares between 2003 and 2007 (*Agribusiness Week*, 20 July 2008). The government's Corn Production Enhancement Project

7 Analysis of land utilization, OpenSTAT. While the original act did not cover conversion to livestock pastures, the Philippine Supreme Court subsequently legalized land conversion to livestock (Carranza and Mato 2006).

8 Analysis of land utilization, OpenSTAT. The nonfood crops include coconut, cassava, abaca, rubber, cotton and tobacco, plus the allocation of corn to production of animal feeds.

subsidized the conversion of 139,000 rice hectares into new corn hybrids to increase this crop for livestock and aquaculture feeds (PDANews, 18 November 2007). In addition to land conversions, ricelands have been destroyed by the salinization caused by commercial fishponds (Primavera 1997).

In addition to loss of ricelands, escalation of rice prices resulted from privatization of the National Food Authority (NFA) that had regulated rice and stabilized prices. "As a result of reforms adopted by the Philippine government to comply with World Bank and Asian Development Bank prescriptions, the role of the NFA in ensuring the country's food security and price stabilization has been reduced to being a 'facilitator' of the market forces– the big rice traders and retailers" (Remollino 2008). State intervention to protect rice is not a peculiar phenomenon that is unique to the Philippines. In fact, 32 countries maintain similar authorities that regulate particular agricultural commodities, including several richer nations.[9] Originally mandated to acquire at least 12 percent of the country's rice production, the NFA purchased less than 4 percent of output between 1984 and 2000, and its domestic procurement dropped to 0.05 percent of production between 2001 and 2006. The new government plan is for the NFA to import rice that will be re-sold to traders and retailers. In addition, the private sector will be able to import 183,000 metric tons, even if there is no domestic shortage. Philippine scholars are convinced these changes exacerbate the monopsonistic operation of the country's rice trade and further threaten the livelihoods of small rice farmers. Before the sharp global price increases of 2007 and 2008, Pelegrina (2003: 2) raised alarm about the power of the country's rice traders to control inputs, processing and the market price of rice. "By holding on to their stocks, wholesalers create artificial shortages by hoarding rice to bid up prices or by flooding the market with their stocks to reduce prices to artificially lower levels." A Philippine Senate investigation confirmed that the "Big Seven" rice cartel keeps "consumer prices high through monopsonistic tactics. With limited access to credit or processing and storage of rice, farmers are forced to sell their harvest even at low prices, thus reinforcing the trade/wholesaler control over prices"[10] During the global food crisis of 2007–2008, Philippine economist Cielito Habito contended that the announced grain shortage was artificially "created by long-suspected cartels

9 Japan, Canada, the European Union, Australia, and New Zealand are among the countries that have state authorities that control particular agricultural commodities.

10 The Philippine Senate identified the following companies (and their CEOs) to be the country's rice cartel: JOMERCO Trading (J.G. Soliman), PNS Grains (P.S. Lato), Family Native Supply (R.A. Syson), Jocardo Merchandising (Gil Go), Leoneco Merchandising (Leonico Tan, Janet Tiv), Manila Goodyear (Santos See), and Teofredo Trading.

in the industry that are taking advantage of the tightness of world demand" (*Manila Times*, 7 April 2008). In July 2009, peasant organizations and many media called for a total overhaul of the National Food Authority, after reports by British newspapers that the Philippine Department of Agriculture was involved in a $200 million kickback scheme connected to 2008 rice imports from Vietnam *Manila Times*, 9 July 2009, *Business Mirror,* 9 July 2009).

To complicate matters, the performance of the Philippine rice sector has been far worse than most Asian countries. Between 1995 and 2007, rice production increased far less than the government's targeted export crops. While rice production rose about 54 percent, bananas increased nearly 77 percent and corn rose 63 percent. However, aquaculture increased 137 percent, reflecting the government's greater subsidization of these agro-industrial activities. Since access to water is critical to rice farming, public neglect of irrigation infrastructure has a disproportionate impact on the production of this grain. Despite public investment in new irrigation technologies, there were 9 percent fewer irrigated hectares in 2008 than there had been in 1980. National policy is clear. The government allocated less than 0.1 percent of all public agricultural expenditures for rice research and irrigation infrastructure (David and Balisacan 1995, Guste 2008). As a result, less than half of rice farms are irrigated. Between 1990 and 2010, irrigated hectares declined more than 13 percent, reflecting land conversions to other uses. By 2019, less than 15 percent of arable land was irrigated.[11] Moreover, 80 percent of rice farmers are still landless, operating small parcels of less than two hectares. Consequently, peasant organizations have been politically active since 2000 to protest failure of the government to redistribute lands legally through the agrarian reform program.[12] In 2008, the Philippine House of Representatives passed Joint Resolution 19 which terminated central elements of the Comprehensive Agrarian Reform Program. Acquisition of lands was deferred indefinitely, and compulsory land acquisition was ended. Opposing officials and peasant groups described the politics over the revisions as "landlord-dominated," contending that the new act will worsen landlessness and speed up conversion of farm lands to non-farming purposes (*Pinoy Press*, 20 December 2008).

Publicly declaring the goal of rice-self sufficiency by 2013 (a political promise not met), the Philippine government set the goal of increasing yield per hectare, rather than expanding the farm land that is planted in this

11 Analysis of crop, fishery and irrigation data, OpenSTAT.

12 Numerous newspaper accounts show that protests include peasant objections to land conversions from farming to mining and the private sale/conversion of indigenous lands. For a historical survey, see Ness (2021: 116–120).

important food crop (Philippine Rice Research Institute 2020). "With limited land devoted to food production and more agricultural lands being converted for other purposes," insists the Department of Agriculture, "the only way we can increase productivity is through an advanced farming technology." To overcome land shortages, "biotechnology is the solution" of preference (PDANews, 9 November 2007). Philippine dependence on imported Green Revolution technologies began in 1960 when the Rockefeller Foundation launched the International Rice Research Institute as the vehicle to introduce high-yield varieties that required pesticides and fertilizers. The government cemented the transition by ordering removal of traditional varieties and linking credit to hybrid cultivation (Lindio-McGovern 1997: 62–64). While Philippine peasants once cultivated thousands of traditional rice varieties (Shiva 2000: 80), the government promotes the use of certified hybrid seeds (Philippine Rice Research Institute 2020). Despite widespread peasant resistance, the government's Hybrid Commercialization Program extended seed subsidies, discounted fertilizers, production loans, and guaranteed crop insurance to farmers in an inequitable fashion (PDA News, 22 October 2007).[13]

As practiced by both public and private financial institutions, agricultural credit support is only available to farmers who are using high-yielding seeds, inorganic fertilizers and chemical pesticides– all of which are generally perceived by institutional lenders as assurance of good harvests. This has been widely practiced since the heyday of the Green Revolution, even though there is no Philippine law or official policy that mandates these requirements. This practice has clearly worked to the disadvantage of rice farmers who save, re-use, select and breed their own varieties instead of buying certified seeds. It has also excluded farmers who opt to use organic inputs in growing rice (Searice 2005: 34). By 2005, more than 90 percent of ricelands were planted with hybrid seeds (FAO 2007), but high-yielding varieties are not likely to be a long-term solution.

Because seed cannot be gathered and planted the next season, hybrid rice cultivation is more costly. Indeed, hybrid seeds are priced nearly 17 times higher than indigenous varieties (*Philippine Daily Inquirer*, 25 April 2005). Increased costs associated with hybrid cultivation are passed to small landless farmers who must tie themselves to debt bondage arrangements with landlords to cover the additional expense of seeds, fertilizers, pesticides and technology. In addition, hybrid cultivation requires greater labor inputs, most of which is

13 Several Philippine peasant farmer organizations resist these strategies. For example, MASIPAG (www.masipag.org) is a consortium of peasant farmers and scientists that preserves traditional species and fosters alternative organic approaches.

supplied inequitably by women (Harden 2008). Moreover, all hybrids are not higher yielding than traditional varieties because some are created to be resistant to special conditions, such as drought (Philippine Rice Research Institute 2020). With funding from the Rockefeller Foundation and the governments of Germany and Japan, the Philippine Rice Research Institute announced in June, 2009 three new hybrid varieties that will be resistant to flooding, drought, and salt (*Seedquest*, 4 June 2009).

> For some of these farmers, the rice hybrids did increase yields, but for many, the crop failed. [There have been many] reports...of standing crops not forming any grain and increased incidences of destructive pests. ... Few farmers ended up profiting from the largess [of government subsidies]; rather the money flowed into the pockets of the rural banks and private loan institutions, the suppliers of machineries, the contractors of post-harvest facilities, and most importantly, the agro-chemical and seed companies. Private seed companies are the big beneficiaries of the hybrid rice programme. ... Most of the subsidies on seeds were channeled to just one company. ... The Department of Agriculture acknowledged in early 2006 that there was a 50–60 percent drop-out rate among farmers who adopted hybrid rice. (GRAIN 2007: 1)

To complicate matters, the government's Hybrid Rice Commercialization Program has been riddled with problems. Three companies dominate hybrid rice seed marketing: SL Agritech, Bayer, and Bioseed (PDANews, 8 November 2007). While the government is pinning its hopes on Green Revolution solutions, it is hard to see how small farmers will be able to absorb these increased costs when they only receive 9 percent of the retail price of the grain (Intal and Garcia 2005).

Even before the 2008 global rice crisis, one National Food Authority official publicly criticized policy threats to ricelands, stating that "one of the main factors that led to the decrease in rice grain yield is the land-use conversion policy of the government" (*Bulatlat*, 19 February 2006). At the peak of the 2008 global rice crisis, the government announced its recognition that there has been "a significant increase of land conversions from rice to other agricultural plantations" and imposed a two-year moratorium on such conversions (PIA News, 19 July 2008). Subsequently, the government announced contradictory land-use goals to meet its export growth targets. Twenty-seven provinces use former ricelands to cultivate flowers and ornamental plants for export, and the Department of Agriculture is seeking more foreign investments in this sector (PDA 2009a). In Northern Mindanao, large tracts of land were converted

into fishponds to cultivate tilapia for export (Aguiba 2004). Even though the World Bank and the IMF contend that agrofuel policies were responsible for three-quarters of the 140 percent increase in global food prices between 2002 and 2008, the Philippine government expanded its biofuel goals.[14] Legislation to spur biofuel production contradicts the moratorium on riceland conversions by mandating a 10 percent blend of bio-ethanol in gasoline and a 2 percent coco-methyl ester in diesel by 2010 (Republic of Philippines 2009). In 2001, the Philippine Coconut Authority announced its intention to develop 220,790 hectares as new palm oil areas for the emerging biofuels industry.[15]

By entering into joint ventures with Philippine companies, foreign corporations will be able to bypass land conversion restrictions (*Philippine Journal Online*, 30 June 2009). For example, the government signed a 2007 bilateral agreement with the Chinese government, allocating 1.4 million hectares to production of maize, rice and sorghum hybrids that will be processed into ethanol for export to China (Borras et al. 2007: 1560). In 2008 and 2009, the Philippines made land lease agreements for 340,500 hectares with Brunei, Kuwait, New Zealand, Oman, Qatar, and Saudi Arabia (Cruz 2011: 20–22). The government is providing $1,000 subsidy per hectare in raw materials and technology in an agreement for Malaysian investment in 13,500 hectares, and it has leased 400,000 hectares to Pacific Biofuels, a Japanese holding company. The country's biofuel goals are also aimed at industry.[16] Ford Philippines will manufacture the first Southeast Asian flexible fuel engine, aiming to market 105,000 engines annually.[17] This array of contradictory land use goals makes it evident that there is no systematic national oversight aimed at preventing riceland conversions. By 2013, the Philippines expended more than twice as much on wheat imports, primarily from the United States, as it did on rice imports, reflecting a dramatic shift in urban cereal consumption since the 2008 food crisis.[18] By the second decade of the 21st century, palm oil production is well established in the Philippines and is leading to food insecurity for plantation workers and sharecroppers. Indeed, small producers and waged laborers enter

14 One World Bank economist argues that the most important factor in food price increases "was the large increase in biofuels production in the US and the European Union. Without these increases, global wheat and maize stocks would not have declined appreciably, oilseed prices would not have tripled, and price increases due to other factors, such as droughts, would have been more moderate" (Mitchell 2008: 6).

15 USFAS news, 11 March 2001.

16 USFAS news, 3 May 2001.

17 USFAS news, 15 June 2007.

18 Analysis of imports, UN COMTRADE database.

debt bondage with corporate-controlled cooperatives to cover current food costs against future earnings (Montefrio and Dresssler 2018).

1.2 *Privileging Export Seafoods over Local Consumption*

In addition to the privileging of commercial "high-value" exports over rice, Philippine food security is threatened by the government's prioritization of fish and shellfish for export. Traditionally, these seafoods provide 70 percent of the animal protein in the Philippine diet (Barut 2004). Even though 2010 total fishery output was nearly 41 percent lower than national needs at traditional levels of consumption, the Philippines redirected 13 percent of its fishery production to exports and nonfood purposes. As a result, the fishery commodities available for domestic consumption fell 66 percent below the country's nutritional needs (see Table 3). We are convinced that the government's per capita estimate of 38 kilograms represents an ideal healthy standard for the country, but per capita consumption of fish and shellfish has steadily declined since 1995.[19] We must slash the government's per capita consumption estimate by 50 percent to achieve a numerical balance between production, domestic consumption, outputs, exports and nonfood uses (see Table 3). In the late 1980s, Philippine scholar Renato Constantino (1988: 39–40) warned that fish exporting had "reduced the availability of these foods to our people in absolute terms" and had raised local prices to the point that "much of what is left is beyond their reach." Clearly, a high proportion of the Philippine population is eating too little of these nutritious foods, as evidenced by widespread protein shortfalls, iron deficiency anemia and iodine-related health problems since the late 1990s.[20]

Export fishery production endangers food security in three ways. First, mangrove deforestation for fishponds caused sharp declines in the numbers and biodiversity of wild fish, crustaceans and mollusks. Second, mangrove destruction has been almost entirely at the expense of fishing households that traditionally collected wild foods from these forests (Anderson 1987: 262). For instance, fishpond chemicals have made traditionally collected snails too toxic for human consumption, and other crustaceans and mollusks have been depleted to such an extent that poor households rarely find them in the wild (Primavera 1997). Third, the export strategy removed species from the domestic

19 Analysis of Philippine National Nutritional Survey (1994, 1999, 2007, 2017, 2019).

20 Analysis of Philippine National Nutritional Survey (1994, 2017, 2019). Of all the seafoods regularly captured or raised in the Philippines, mussel, octopus, and oysters provide the highest inputs of iron and protein, with anchovies, shrimp, sardines and tuna supplying lower levels. All these species are targeted for export at high levels.

food chain and has lowered production of locally-consumed species. Because a greater percentage of roundscad is exported, 23 percent less of this fish is now consumed than was the case in 1990.[21] Similarly, the trend in milkfish production is indicative of the degree to which seafood insecurity is worsening. In the 1960s, milkfish accounted for 95 percent of fishpond production (Primavera 1995), as this species was a staple protein source for the entire country. In 1988, milkfish accounted for 88 percent of the fishpond production, indicating that the country had not yet moved fully into export aquaculture (Philippine Annual Fisheries Profile 1988). "For a very long time, aquaculture in the Philippines was virtually synonymous with milkfish culture, specifically in brackish water ponds, relying totally on natural food" (FAO 2004b: 1).

However, local consumption of milkfish has steadily declined, as this species has been displaced in monocultural fishponds. In the 1980s, aquaculture shifted to shrimp production for export (Yap 1999). "Market forces at the national level stimulated shrimp aquaculture disproportionately in relation to finfish aquaculture, in part because shrimp brought in more foreign exchange. Lower-income domestic fish consumers could not compete in world markets with high-income consumers of shrimp" (Jomo 1991: 39–40). Between 1995 and 2007, milkfish production expanded after it was targeted for export (Philippine Annual Fisheries Profile 1977–2007). In 2005, the Philippines produced 55 percent of the world's milkfish, and the country exported one-third or more of its production. Consequently, domestic prices for milkfish rose as outputs declined and exporting increased (PDA 2005). By 2009, per capita consumption of milkfish had steadily declined since 1990, and it was rarely eaten by the poor (*Agribusiness Week*, 26 March 2009).[22] Despite that decline in domestic consumption, the Bureau of Fisheries and Aquatic Resources announced in 2009 its goal of expanding tilapia production for export by converting Northern Mindanao milkfish ponds (Philippine Annual Fisheries Profile 2009, 2010).

2 Import Dependence and Risks to Food Security

It is misguided and naive to point the finger at rice imports as the cause of the country's trade imbalance because the problems are much more complex. Privileging exports over production of food for domestic consumption traps the country in the vicious interplay between:

21 Analysis of food balance sheets, FAOSTAT.

22 Analysis of food balance sheets, FAOSTAT.

1. national grain and fishery shortages caused by exporting and nonfood uses,
2. dependence on imported agricultural and aquaculture inputs,
3. meeting import requirements that accompany participation in the WTO,
4. national policies grounded in rising food importation,
5. and transnational corporate targeting of children.

Between 1994 and 2008, the value of exported foodstuffs increased to 1.8 times the 1994 level, but the cost of imported inputs nearly tripled.[23] By 2010, the country exported only 86 cents worth of agricultural and fishery exports to every dollar of food imports. Moreover, the largest segments of the agricultural imports lie, not in foods but in agricultural inputs.[24] In 2016, nearly 81 percent of Philippine imports consisted of high fat/sugar foods and luxuries such as alcohol, coffee, and tea (see Table 4).

2.1 *Dependence on Imported Agricultural and Aquaculture Inputs*

In 2006, the country spent only one-quarter as much to acquire rice as was expended on imported agricultural inputs. The privileging of exports over production for local consumption has led to heavy dependence on imported agricultural inputs to produce crops, livestock and aquaculture species. While targeting land expansion for export crops, the Medium-Term Development Plan advocates application of high-yield hybrid seeds and inorganic chemicals to increase rice production on fewer hectares (Republic of Philippines 2000). Since 1961, use of pesticides expanded eleven-fold in Philippine agriculture (FAO 2007). The national government has promoted the cultivation of high-yield varieties which take only three months to mature. The more rapid intervals are dependent on chemical fertilizers and pesticides, as well as the use of hand tractors and threshers. The large-scale shift to the use of hybrids that signaled the Green Revolution increased harvests and allowed widespread double cropping. However, it also increased production costs for optimal harvests because hybridized and genetically-modified seeds require fossil-fuel-based fertilizers and pesticides (Mabunay 1995: 340–41; Pollan 2009: 73)

In 2005, farmers and fishpond operators applied 76 kilograms of fertilizer per hectare, 1.3 times more than they used in 1995. Indeed, fertilizer use increased about 3.1 percent annually between 1995 and 2005, and nearly half of these expensive imports were used in fishponds.[25] By 2008, fertilizers and

23 Analysis of exports and imports, UN COMTRADE database.
24 Analysis of exports and imports, UN COMTRADE database.
25 Analysis of imports, UN COMTRADE database.

pesticides ranked seventh among the country's most costly imports (PSA News, 14 May 2009). After structural adjustment programs required elimination of government subsidies of inputs, the costs borne by farmers skyrocketed. Between 1990 and 2008, the production cost of corn more than doubled while the 2008 production costs of rice rose to 1.8 times the 1990 level.[26] Most of these rising costs lay in imported inputs. By 2008, the cost of all types of imported agricultural inputs was nearly 2.8 times greater than 1994 levels. Even worse, imported agricultural inputs have outstripped the value of agricultural exports. Between 1998 and 2002, imported inputs increased an average of 4.8 percent, but agricultural exports declined an average of 4.9 percent. Even though exports declined 0.2 percent between 2000 and 2002, imported inputs rose nearly 8 percent. By 2006, the country paid out $4 for imported fertilizers and pesticides to every ten export dollars in foodstuffs. In 2010, the country expended 44 cents on imported inputs to every dollar of agricultural and fishery exports, and the national cost of imported agricultural and fishpond inputs continued to rise through 2020.[27]

Philippine farmers pay higher costs for these imported inputs than other Asian farmers. The Philippine government acknowledges that, in the 1990s, "prices paid for the various fertilizers used by Filipino farmers were nearly double that of the world price. This may be partially due to possible monopolistic pricing since more than half the supply of fertilizers in the market comes from a single company" (Republic of Philippines 2000: 24–25). The Philippine Agricultural Pesticide Institute accounts for 95 percent of the country's sales, and it acquires those inputs from a few multinational corporations that dominate world trade in these chemicals (Constantino 1988: 56). According to the country's Medium-Term Development Plan, "there are relatively few farmers willing and able to grow certified [hybrid] rice seeds [because] seed cost is higher here than in Thailand, Vietnam, Indian and China" (Republic of Philippines 2000: 24–25). Despite these harsh realities, the government subsidizes and the International Rice Research Institute advocates heavy reliance on hybrid seeds. This public policy "has had the effect of transplanting a food production system designed for temperate zones to tropic and subtropical areas. Whereas traditional seed varieties are acclimated to Asian conditions, the new seeds require large amounts of fertilizer" (Constantino 1988: 55).

26 Analysis of AFSIS (Tables 22.1 and 22.3).

27 Analysis of imports, UN COMTRADE database. Imported inputs include live animals, plants and fishery species, animal and aquaculture feeds, fertilizers, agricultural chemicals, agricultural machinery, aquaculture technology, boats and tools.

In addition to reliance on hybridized rice seeds, much of the corn grown in the Philippines depends on imported seed and inputs. The Corn Production Enhancement Project subsidizes imported hybrid seeds, processing equipment, tractors, and tube wells (PDA News, 18 November 2007). Since 2007, the Department of Agriculture has conducted field tests and marketed genetically-modified corn seed imported from the US. In return, the government has guaranteed "continued access to the Philippines for an estimated $400 million worth of US commodities and products from biotechnology."[28] Moreover, hybridized and genetically-modified seeds have been imported to grow vegetables and cutflowers, and the government has imported hybridized coconuts and bananas that require large quantities of pesticides. All told, seed and chemical imports make the country's agriculture dependent on inputs that are marketed by three or four multinational corporations. In addition, the country's livestock is predominated by hybridized chickens, pigs, cattle, and aquaculture species that have necessitated more than $13 million annually in live animals that serve as breeding stock.[29] In 2005, for example, 23 metric tons of breeding cattle were imported to improve beef production for export to China (PDA 2005). One Philippine newspaper comments that "the growing of hybrid pigs, the planting of hybrid corn seeds, and the miracle rice seeds, all guarantee that the multi-billion peso food industry will forever be in the hands of foreigners and the multinationals" (*Bulletin Today*, 17 September 2004).

In 2006, the Philippines expended $2.2 billion for imported agricultural inputs. In order to have a full assessment of imported inputs, we need to account for items that the official government statistics hide in such a way that scholars might not interpret them as nonfood items. In other words, we need to disaggregate all imported cereals that were fed to animals, all fishery products that were fed to aquaculture or livestock species, processed animal feeds, live breeding animals, fertilizers, pesticides, and agricultural machinery. By doing so, we learn that nearly 60 percent of imported inputs were intended for farm animals and fish while another 10 percent were aimed at expanding cultivation of ornamental plants for export. For every $1 of imported inputs utilized for food production, another $1.50 was absorbed by animals and fish. While many scholars assume that the cereals expense reported by the Bureau of Agricultural Statistics is mostly rice, this is not an accurate assumption. We wonder if the government does not lump cereals together in this misleading fashion in order to give the impression that a majority of the import dollars are allocated to rice purchases for human consumption. When types of cereals

28 USFAS news, 13 April 2007.

29 Analysis of imports, UN COMTRADE database.

are disaggregated by grain type and by food/nonfood sectors, a very different picture emerges. In reality, only about 51 percent of the value of cereal imports is allocated to rice for human consumption.[30] While the Philippines expended more than $1.5 billion for imported rice in 2008, the country also paid out $1.1 billion for wheat and other grains for human consumption. For every $2 the country paid for imported rice in 2008, it spent another $1.48 to import wheat, wheat flour, corn meal, and cereal preparations. Nearly one-fifth of expensive American wheat imports are fed to animals.[31] Even during the 2008 global grain crisis, more than 9 percent of the imported cereals (valued at $259 million) were used as animal feeds. When we take our analysis one step further, an even more disturbing trend emerges. When we combine the separately reported value of imported animal feeds with the cereals consumed by animals, we see that the country expended nearly $969 million for imported inputs to feed animals and aquaculture species. In reality, then, the Philippines imports $3.70 worth of animal feeds to every ten dollars it expends on grains consumed by its people.[32]

Animal feeds are also hidden in other categories of official record keeping. More than 73 percent of the fishery imports consisted of fishmeal and feeds to produce shrimp and other export fish. In 2008, these imported fishery feeds were valued at more than $90 million. In comparison to agricultural crops or livestock raising, aquaculture is far more dependent on imported inputs (Philippine Annual Fisheries Profile 2004–2008). Ten importers control distribution of the manufactured fertilizers needed for aquaculture, and fishmeal is regularly imported, primarily from Peru, for use in feeds. Commercial vitamin and mineral mixes are imported by feed manufacturers for use in aquaculture and livestock brands. Three large companies control the production and distribution of fish feeds while five commercial brands supply shrimp feeds. These feeds require seven to ten additives, a majority of them imported. In fact, half to three-quarters of all additives are imported for aquaculture, and a majority are utilized in shrimp feeds (Cruz 1997). Moreover, the value of fish oil is reported in the government category termed "animal and vegetable oils and fats." Valued at more than $129 million, about 60 percent of these imported commodities are utilized in livestock, pet and aquaculture feeds. When we combine all inputs into agricultural crops, livestock and fishery production,

30 Statistics from UN COMTRADE database were used to disaggregate cereals by type and by human/animal consumption.

31 USFAS, 25 March 2007. The USFAS ranks animal feeds as its eighth most profitable export to the Philippines.

32 Analysis of imports, UN COMTRADE database.

the country expended nearly $2.2 billion dollars on inputs that represented 87 percent of the value of all exported foodstuffs in 2008. To state this another way: the country expends almost the same amount for imported inputs that it earns for exported foodstuffs.

2.2 *Meeting WTO Import Requirements*

Because of trade liberalization requirements, the Philippines must gradually eliminate tariffs and open its domestic markets to the inflow of most of the same edible products it exports (*Philippine Daily Inquirer*, 10 June 1986). The main objective of the World Trade Organization (WTO) Agreement on Agriculture "was to deal with [global] overproduction, rather than to promote agriculture in developing countries." In the Philippines, the WTO reduction of import protection transformed the country from a food and rice exporter into a food and rice importer (ESCAP 2010: 44). In 1994, the Philippines exported foods that were valued at nearly 98 percent of the value of its food imports. In 2006, the value of imported foods was 1.1 times greater than the value of exported foods. By 2008, the country was importing $2.50 worth of foodstuffs to every dollar's worth of exported foodstuffs, and most of these imports resulted from trade liberalization.[33]

Because the WTO requires countries to import a "minimum access volume" of foodstuffs, the Philippines must import up to 4 percent or more of domestic consumption levels of foods (Pelegrina 2003). For this reason, the country imports more rice than it needs to meet human consumption needs (Ignacio 2005). The value of the country's agricultural imports has steadily risen since 1998, exactly in the same time period that the country has been pursuing aggressive policies to increase "high value" cash crops and fishery exports. Many of these imported items are produced at surplus levels by the Philippines, and most of the value of food imports is accumulated through foodstuffs other than rice. In 2007, the country exported $1.26 million worth of cassava, a traditional food available at levels well above domestic consumption. Still, the country imported cassava valued at 15 times its tuber exports. Even though it exported surplus corn, the country imported nearly $49 million worth of this commodity in 2007.[34] Philippine scholars point out that much of the importation results from domestic industries purchasing cheaper raw foods abroad, then processing them for re-export. For instance, the large volume of imported tuna "does not translate to enhanced food security" because more than 90 percent of it is processed by canneries for re-export (Vera and Hipolito 2006: 57).

33 Analysis of exports and imports, UN COMTRADE database.

34 Analysis of imports and exports, UN COMTRADE database.

2.3 *Dependence on Imported Processed Foods*

Criticized by western doctors for their ill-health effects, processed products have been imported by Asian countries at soaring prices since 1990 (*Global Health Watch 2* 2008: 136). Worldwide, processed foods accounted for nearly 38 percent of the value of all imported foods in 2006. That year, the Philippines allocated $1.73 to imported processed foods for every dollar expended on rice.[35] This trend toward consumption of imported processed foods reflects the systemic expansion of dietary preferences and luxury foods that predominate in the richer countries. The global agro-industrial food system aims to popularize a worldwide profitable "hegemonic dietary regime" that is grounded in "mass consumption of standard manufactured edible commodities" that replace healthier domestic crops (McMichael 1994: 23–27). As Asian countries become dependent on imported foods, "diets are ruptured from local ecology and tradition and restructured through international food markets" (Bernstein et al. 1990: 26). Since 1980, food imports have altered dietary preferences to the degree that per capita wheat consumption increased 63 percent in rice-consuming Asian societies. At the same time, rice consumption rose only 20 percent worldwide, and the use of traditional root crops fell sharply (McMichael 1998: 103).

Traditionally, Filipinos consumed hundreds of varieties of fish and shellfish (Herre 1945: 158), including small species that the FAO (2012d) considers "trash fish." In contrast, the country purchased nearly $95 million worth of tuna, mackerel, and milkfish in 2007 (AFSIS 2008). Today, most Filipinos are restricted to a diet of a few types of finfish, and the poor eat the fish with the least protein (Philippine Annual Fisheries Profile 2007). The Philippine Fisherfolk Association contends that the "export-oriented, import-dependent orientation" of the government's fishery agenda results in "mass flooding of cheap fish imports all over the country," driving domestic prices down and exacerbating poverty and hunger among fisher households. At the same time, "the country's best fishery products...do not end up on the tables of ordinary Filipinos but are exported to rich countries" (*Pamalakaya Times*, 15 March 2009). Through its capture fishing of tuna for export, the country has nearly depleted a seafood that has historically been crucial to the domestic food chain. While shrimp and crab are the most valuable aquaculture exports, these foods are no longer accessible to most Filipinos (Philippine Annual Fisheries Profile 2008). In fact, shrimp is eaten by very few, and per capita consumption steadily declined between 1990 and 2019.[36] Japanese consumers devour 3,479

35 Analysis of imports, UN COMTRADE database.

36 Analysis of Food Balance Sheets, Philippine Annual Fisheries Profile (1995–2019).

times more shrimp, and Americans ingest 1,800 times more of this shellfish than Filipinos (FAO 2005a). Constantino (1988: 36–40) points to the *protein imperialism* that results from the global agro-industrial food system. "While Filipino people were experiencing widespread protein deficiency, fish and meat were being exported." Moreover, the country shipped out high-protein fish and imported less-nutritious varieties, such as canned mackerel, "low-quality items we have to content ourselves with while we export the best for the Japanese to relish." In 2010, the Philippines exported 342 million tons of high protein seafoods (crustaceans, mollusks, finfish that were once an affordable part of the traditional domestic diet) while it imported more than 382 million tons of less-nutritious finfish and meats. As a result, there was a shortfall of 1.3 kilograms per capita of high iron seafoods.[37] While shipping out crustaceans and mollusks that could address widespread iron and iodine deficiencies, the country imported less nutritious protein sources that were too expensive for a majority of Filipinos. Such unequal nutritional exchanges have led to declines in per capita consumption of iron-rich seafoods since 1995. By 2010, Filipinos were substituting 0.8 kilogram of low/no-iron frozen, canned, dried, or smoked fish to every kilogram of fresh fish they consumed in 1995.[38] While the Philippines shipped nearly 73 percent of its fishery exports to low hunger countries (see Table 5), its food imports represented losses of 62 percent of the iron and 15 percent of protein embodied in its fishery exports (see Table 7).

As a reflection of the trend toward a profitable global diet, three-quarters of the value of 2010 Philippine food imports was expended for foods that convert into sugars and fats in the human body, including 36 percent for processed foods. In 2016, only 15 percent of the food import budget was spent to acquire high iron/protein foods while 4 percent was allocated to vegetables and fruits (see Table 6). Nearly one-third of the country's food imports are high-priced due to public subsidies by the United States, including $351 million in wheat, $216 million in soy products and $152 million in dairy products annually. More than half the $1.7 billion in US agricultural exports to the Philippines are processed foods, and the US is its "top food and beverage supplier." In addition, the US targets the Philippines as a growing market for processed beef, turkey, and chicken for "upper income consumers." By 2007, Filipinos were consuming more than $41 million annually in US snack foods, condiments, sauces, gum, bottled water, soft drinks, and alcoholic beverages.[39] Because of such imports–

37 Analysis of export and import data, UN COMTRADE database.

38 Analysis of Food Balance Sheets, Philippine Annual Fisheries Profile (1990–2010).

39 Analysis of processed food exports to the Philippines, 2000–2006, USFAS. Also USFAS news items dated 6 November 2007, 13 February 2004, 2 October 2009.

many of which are considered unhealthy in the countries that export them– Filipinos include less rice and fish in their diets than they did in 1961 (FAO 2007). By 2013, fishery commodities accounted for less than 15 percent of per capita dietary consumption (see Table 4). One of the public indicators of the popularity of American junk foods is what has occurred with SPAM since it was popularized in the Philippines during World War II. More than 86 percent of a serving of this canned pork consists of fats and salt, and it contains no vitamins or micronutrients other than a trace of iron.[40] Manufactured in the Philippines, SPAM averaged about $3.50 per pound in mid-2009, making it more expensive than several high iron, non-processed seafoods and meats that are produced domestically. Despite its price, SPAM has been popularized by fast-food restaurants (Matejowsky 2007).

There are three other problems with Philippine import dependence. First, a high proportion of seafood imports are consumed by animals, as are about one-quarter of the cereals (Philippine Annual Fisheries Profile 2010). In 2016, per capita imports of fish feeds exceeded the per capita value of fish imported for human consumption (see Table 9). Second, nearly two-fifths of the country's imports are processed meats, fish, cereals, vegetables and fruits, alcoholic and food additives that are too expensive to be incorporated into the food baskets of most Philippine households (see Table 6). In 2016, the Philippines expended nearly 81 percent of its import budget on foods high in sugars and fats, expending more on cocoa, coffee, tea, alcohol and beverages than on high-iron foods (see Table 6). Third, these imports clearly do not help to combat the country's nutritional deficiencies, especially widespread shortfalls in iron, Vitamin A, and iodine (see Table 6).

The World Health Organization criticizes multinational corporations for marketing high fat, high sugar processed foods in food-deficit poor countries (Waxman 2003). Worldwide, fat consumption has increased nearly 20 percent since 1967, primarily due to higher intakes of processed foods in Asia. Health agencies in several Asian countries, including the Philippines, are alarmed by a growing "double burden" of malnutrition that includes (a) the predominant form of wasting/stunting associated with nutritional deficiencies caused by insufficient food intake and (b) a rising incidence of obesity linked to overeating of imported foods. Greater intakes of carbohydrates, fats and sugars are occurring among higher income groups who consume more expensive processed imports, so there is a growing incidence of over-nutrition and obesity in these households. In contrast, the poor are eating fewer calories, so their intake

40 Analysis of the SPAM label.

of protein-rich and iron-rich food has declined, often replaced by low-quality rice or cheap imported noodles. The average daily Filipino diet declined in quantity from 897 grams to 886 grams between 1978 and 2003, but the caloric intake rose from 1,804 to 1,905 calories, largely as a result of increased carbohydrate intake from processed foods. Despite the rising caloric intake, a majority of households have inadequate dietary energy levels. Since dietary intake from protein has shrunk to less than 12 percent, Filipinos acquire nearly 88 percent of their energy calories from unhealthy fats, sugars and carbohydrates. Only about 8 percent of the population reported sufficient levels of fruits and vegetables. Because of rising prices, fruit consumption has dropped 60 percent since 1978, causing low vitamin and other micronutrient shortfalls for most Filipinos. Similarly, the consumption of rice, starchy roots and tubers and fish has steadily declined.[41] As a result of these food security problems, the Hunger Index for the Philippines is *serious* because 16 percent of the population is under-nourished and nearly 30 percent of young children are underweight (see Table 2). Moreover, two-thirds of Philippine children and two-fifths of women suffer from iron deficiency anemia (McLean et. al 2009). Such undernutrition has life-long impacts on impoverished households because underweight babies stay small, and the final adult height is largely determined by nutrition before age two (Pedro et al. 2006).

2.4 *Integration of Imported Processed Foods into Public Nutrition Policy*

These disturbing trends result from lower consumption of the nutritionally-rich foods that are targeted for export, accompanied by a rise in household use of processed foods that are far less healthy. The country's nutritional programs are exacerbating this trend through their focus on "fortified" processed foods and on "technological fixes" through imported supplements. Dietary changes toward processed foods are being stimulated and reinforced through nutritional standards that are employed by public health agencies and by school food programs.[42] Based on a decade-long study of the negative effects of junk food on human health in the Philippines, the Tokyo Graduate School of Medicine has found that "poor people commonly believe that instant noodles fortified with Vitamin A and iron-supplemented canned sardines are healthier than vegetables. Perhaps this view is unsurprising considering that one of the government's nutritional guidelines for Filipino children includes instant noodles. Moreover, multivitamin tablets are seen as prestigious while the consumption of tropical, indigenous, and cheap vegetables...are regarded

41 Analysis of Philippine National Nutritional Survey (1994, 2003, 2019).

42 Review of policies at PFNRI website. Also see PFNRI (2000, 2019).

as symbols of poverty" (Matejowsky 2007: 35). Nutribusiness is profitable in the global food system, and it consists in the marketing of "fortified" foods and nutritional supplements. However, it amounts to "profiteering in the name of nutrition" because it advocates consumption of imported artificial additives and expensive protein sources. As Omawale (1984: 178) observes, Asian public nutrition programs "are sources of direct profit for capitalists, such as those selling USAID commodities."

Philippine government nutrition websites provide insight into the degree to which imported processed foods, including unhealthy ones, are prioritized as part of the country's official strategy to combat malnutrition. The Food and Nutrition Research Institute (PFNRI) defines part of its mission to be the "development of technologies for the global and domestic markets," reflecting the government's focus on export. The PFNRI also offers a list of "commercializable food technologies" that focus on imported soy as the primary source of protein, in combination with rice and domestic foods, especially in baby foods. The "nutritionally adequate weekly menus" recommended by the PFNRI keep rice carbohydrates central to the diet, but fish and shellfish appear in only 6 meals out of 81 spread over a month. Almost every day, there are at least two recommended imported foods, most of which are too expensive to be afforded by the poor, including hot chocolate, orange juice, avocado, salmon chowder, beef and oatmeal.[43]

The Philippine Nutrition Council (NNC) prioritizes "fortified foods" that result from "private sector, industry-led" development and promotion of processed foods.[44] In July 2009, the NNC offered a list of 281 foods that were awarded the government's "Pinoy Seal of Approval" because companies claimed they were "fortified" with iron (83 items), Vitamin A (281 items) or iodine (9 items). Unlike the PFNRI menus, the NNC list includes few rice-based foods because the approved foods are disproportionately wheat and corn derivatives. Two-thirds of the items on the NNC list are either imported processed foods, or they require imported inputs, especially wheat. While the PFNRI weekly menus combine fresh and processed, domestic and imported foods, the NNC fortified list reflects no attempt to educate the public about sources of nutrients that occur naturally in foods produced domestically. Neither of these government nutrition websites informs the public (or the school and government personnel who implement these guidelines) that domestic cashews, mussels, oysters, shrimp, sardines and raw coconut meat are excellent natural sources of iron or that mango and tuna are the country's best natural sources of Vitamin A. To

43 Analysis of recommended weekly and monthly menus, PFNRI website.

44 See https://doh.gov.ph/foodfortificationprogram (accessed 2 Oct. 2021).

undertake that public educational agenda would be to challenge the government's focus on exporting those "high-value" foods.

What is most striking is that the NNC list of recommended "fortified" foods consists almost entirely of carbohydrates, many of which are heavy with transfats, saturated fats, and sugars. Fifty wheat flours, breads, crackers, and noodles appear on the list, reflecting high dependence on subsidized wheat imported primarily from the US. Even though these richer countries are marketing their products as part of this dubious list, American and European doctors and hospital nutritionists never integrate high carbohydrate snack foods, like the cheese spreads or deep fried chips on the NNC list, among healthy sources to acquire iron or vitamins. Any healthy effects from the added nutrients are offset by the transfats, sugars, high cholesterol and excessive calories. It is nonsensical to think that the added iron or Vitamin A is more significant than the connection between heart disease (a growing problem for Filipinos) and these types of carbohydrates and fats (Pedro et al. 2006). Fifteen items on the NCC list fortify corn products with iron, so the government program fails to educate the public that high consumption of corn causes the body not to absorb iron efficiently (FAO 1989b). The fortified list also integrates imported processed foods like instant drink mixes, dried french fries, mayonnaise, sandwich spreads, cake mixes, and hot dogs laden with carbohydrate fillers, none of which are recommended as healthy food choices by American and European medical personnel. The NCC's questionable operational philosophy is that adding a micronutrient to a food makes it healthy, no matter how many carbohydrates, fats or sugars it contains. The not so hidden agenda of the NNC "fortified foods" list is to expand the market base for the approved products through the use of the "Pinoy seal" to encourage Filipinos to buy them. Indeed, eight companies supply 40 percent of the approved items on the NCC fortified list, and they each market 10 to 21 different foods with the advantage of the "Pinoy seal."

Rather than educate the public about the nutritional value of natural fresh foods produced in the country, government policy focuses on artificial substitutions that will not compete with export goals. Let's reflect on two examples. Iodine deficiency, the world's number one cause of mental retardation, is such a significant problem in the Philippines that the government requires iodization of salt. Fish oil and palm oil have natural iodine, so these are the natural foods that would be readily available to Filipinos, if these resources were not being targeted for export and for biofuel production. Iodized salt is not a likely solution because the poor cannot always afford to purchase this commodity, especially the more expensive iodized form (FAO 2003a). Only 38 percent of households use iodized salt because it is more expensive, and it

is unavailable in many rural areas.[45] Moreover, iodized salt becomes unstable in humid climates and loses nutritional value (Diosady and Manna 1997: 398). For a sizeable segment of the population, stunting and other illnesses derive from *chronic energy deficiency* that follows shortfalls of protein (fish being the most healthy source), natural starchy foods (such as cassava and rice), and healthy fats (like Omega 3 in fish). Obviously, the country produces sufficient amounts of several foods that could be utilized to attack micronutrient deficiencies. Greater accessibility, especially by inequitably impacted women and children, to the foods that the country exports could relieve these nutritional shortfalls in ways that processed substitutes do not. However, all the foods that are highest in iron, protein, Vitamin A and iodine are targeted for export. The Philippine government has established a clear public policy: "fortified" (but often unhealthy) processed foods and imported supplements for Filipinos, the most nutritious natural crops and seafoods for export.

2.5 *Corporate Market Targeting of Philippine Children*

In addition to these dangers of food importing, corporations aim many of their processed food campaigns at children, the age group that suffers the highest incidence of nutrient deficiencies. Food manufacturers and distributors are integrated into public school activities in ways that are intended to foster brand name recognition. A perusal of a newspaper's weekly list of school sports competitions reveals a running list of corporate logos, like the Coca Cola Tigers and the Red Bull Barakos (*Manila Standard*, 30 May 2008). Moreover, the country's school program for hungry children has been tainted with scandals about overpricing and substandard quality (*Manila Times*, 29 May 2009). Corporate promotion of baby food formulae and mixes has also been intense in the Philippines, as in several other Asian countries. Only 44 percent of Asian infants are exclusively breastfed for the first four months, a rate that is lower than breastfeeding in richer countries. Worldwide, 32 multinational corporations dominate the production and distribution of milk substitutes, but Nestles controls 40 percent of the world market in these commodities (MacDonald 2005: 122–24). Throughout the 1990s, the Asian marketing campaigns of infant formula manufacturers were aimed at convincing women and health personnel that bottle-feeding is the most nutritious method for infants. In rural areas, poor women purchased cheaper condensed milk products, thinking they were as nutritious as human breast milk (Kwiatkowski 1998: 49). The World Health Organization (1992) pointed to early weaning as a contributing factor in the

45 Philippine National Nutritional Survey (2019).

stunting of young children, noting that breastfeeding "is less common in the Philippines than in other developing countries, with only about a third of all infants exclusively breastfed at ages younger than three months." By age six months, less than 10 percent were exclusively breastfed. UNICEF (2003) reports that only 37 percent of Filipino babies are breastfed six months, so nearly 60 percent of infants aged six months to one year suffer from anemia. These breastfeeding trends had not changed by 2019.[46]

The middle-class market potential for baby formula is highest in Asia, and this region accounts for nearly two-fifths of global sales of infant formula (Montlake 2005). Even though 16,000 infants die yearly because of problems related to formula, only about 35 percent of Asian women provide exclusive nursing to their infants for the first six months (Bakshian 2005). Because the Philippines is one of the largest markets for infant formula, corporations like Nestle, Abbot, Wyeth and Mead Johnson spend about $89 million annually on advertising to try to capture the $469 million market for breastmilk substitutes. That advertising has been highly effective, as the Philippines exhibits one of the lowest breastfeeding rates in Asia. Despite UNICEF service announcements over the last few years, infant milk formula is one of the top three consumer products in the country (*New York Times*, 17 July 2007). Nurjana Dones, jobless wife of a Manila warehouse laborer, reports that pregnant women and mothers are bombarded with television ads, posters in medical clinics, and advice from health personnel to utilize infant and baby formulae. She complains that the Philippines is "a poor country where many families cannot afford a decent meal on a daily basis and yet spend [$37] monthly on formula milk– milk whose benefits don't even come close to the benefits of mother's milk, which is free" (Conde 2007). The early advice of health workers can be strategic. "Giving free samples of milk substitutes to new mothers represents a particularly insidious way of promoting formula, because even a few days of infant formula...makes a baby fussy about taking the breast. The mother's lactation will naturally have become reduced through the lack of stimulation and may not be capable of increasing again. In this way, the mother is then forced to feed and buy formula when the free supplies cease, a great cost to the baby, its family, and the state in both health and economic terms" (MacDonald 2005: 125).

To encourage breastfeeding, the Philippine government enacted a 1986 Milk Code that bans advertisements and other promotional activities for formula intended for babies younger than one year. Convinced that companies had been violating marketing regulations, the Philippine Health Department

46 Philippine National Nutritional Survey (2019).

revised the code in 2006, extending the advertising and promotion bans to cover milk substitutes for children up to two years of age. For that reason, the Philippines emerged as a test case for the worldwide campaign of the World Health Organization and UNICEF to increase breastfeeding levels in poor countries. Health Department officials and UNICEF representatives argued that companies influenced mothers most through health clinics and personnel who offered them samples of infant formula (Bakshian 2005). With strong backing from the US Chamber of Commerce, companies successfully secured a restraining order to delay the code revision while a court case was heard. In subsequent months, the companies undertook a massive lobbying effort to try to convince the government that its international trade reputation would be damaged by implementation of the revised Milk Code (Raya 2008). The case was surrounded by a lot of controversy, including the assassination of a Health Department attorney and the attempted killing of a UNICEF lawyer (*Philippine Daily Inquirer*, 18 June 2007). In October 2007, the Philippine Supreme Court ruled that the Milk Code revisions are not "illegal restraint of trade" and broadened regulation of advertising and promotion to cover children older than one year (*Keep Abreast*, 11 October 2007).[47]

Promotion of cold cereal, served with milk, is another imported food agenda that is primarily aimed at children. Worldwide, four corporations dominate cereals, with Kellogg as the leader. In the Philippines, the processed cereal industry is controlled by three companies that are connected to multinational conglomerates Nestle/General Mills (70 percent of sales) and Kellogg. Alaska Milk, one of two major dairy distributors in the country, combines marketing of its fresh, canned and powdered milk products with imported Kellogg cereals, and it maintains a school campaign that markets the idea that "Healthy Breakfast equals Cereals + Milk." Heavily dependent on imported processed foods and inputs, the cold cereal industry markets commodities that are affordable

47 The court ruling set strong restraints on formula marketing. (1) Advertising and promotion of infant formula and breastmilk substitutes are to be closely regulated and must have advance approval by a government agency. (2) The Code is to be broadened to cover all breastmilk substitutes including those for children older than one year. (3) Health or nutrition claims that idealize formula over breastmilk are prohibited. (4) Breastmilk substitutes must carry clear labeling of ingredients and a warning about the danger of bacterial contamination. (5) Milk companies are prohibited from providing any kind of financial or promotional inducement to health workers or the general public, including distribution of samples. (6) Milk companies are prohibited from participation on policy-making bodies or as part of educational contexts for breastfeeding women (*Keep Abreast*, 11 October 2007).

only to the middle and elite classes (Ching 2008: 8). Moreover, two-thirds of the country's supply of milk for such cereal products is imported.[48]

3 Transformation of Foods into Nonfoods

Philippine food security is also threatened by national export agendas that prioritize production of nonfoods or conversion of human nutrients to nonfood uses. In its 21st century development plan (Republic of Philippines 2000), the national government allocated more than a quarter of its hectare conversions to nonfoods, including palm oil, tobacco, rubber, coffee and cut flowers (see Table 11). By 2016, nearly 89 percent of Philippine crop outputs were nonfoods (see Table 3). Once prized as vegetables that formed part of the traditional diet in many Asian countries, seaweed has been diverted to several nonfood uses. In the Philippines, 87 percent of seaweed is processed into carrageenan that is exported for numerous industrial uses (Rosario 2006: 4–5). Globally, there is a *food-feed-fuel competition* for cereals and fish. Worldwide, humans consume 47 percent of grain production, animals ingest 39 percent, and 14 percent is absorbed for industrial uses (Yotopoulos 1985). There is an even deeper polarization with respect to these foods, for richer countries devour 83 percent of the world's grains. On a per capita basis more than twice as much cereal is fed to animals in developed countries as is fed to human beings in developing countries (Imhoff 2010). In the Philippines, more than 11 percent of domestic cereal and one-fifth of imported cereals are used for nonfood purposes.[49] In 2005, there were 395 feed millers in the Philippines, and they consumed 25,000 tons of grain daily. While 15 percent of their feeds are directed toward aquaculture, the rest is used to produce hybridized chickens, ducks and pigs (*Food and Agribusiness Monitor*, 1–6 January 2006). Increasingly, corn is being shifted to nonfood uses. Even though about one-third of Filipinos regularly eat this grain, only 3 percent of corn production is consumed domestically. In reaction to "high demand and price abroad," the government encourages the processing of corn into cornstarch and corn oil for export (PDA News, 9 November 2007). In 2001, 90 percent of the country's corn production was used for nonfood purposes, primarily as livestock and aquaculture feed.[50] In 2007, the Department of Agriculture initiated subsidies and technical outreach to

48 Analysis of imports and food balance sheet for dairy products, UN COMTRADE database and FAOSTAT.

49 Analysis of food balance sheets, FAOSTAT.

50 Analysis of AFSIS, Table 20.3.

increase farmer adoption of yellow corn hybrids that will primarily be used to produce feeds (PDA 2008). Corn-based pet food exports to the US increased 46 percent between 2000 and 2004.[51] Nearly half of traditional tuber and root foods are being diverted to nonfood uses and feeds. In 2001, only 27 percent of the cassava production was eaten by humans while the rest was fed to animals or used for other nonfood purposes, such as biofuels (Imhoff 2010). Despite the high protein content of coconut meat (FAO 1989b), the vast majority of these nuts are exported as coconut oil or for other industrial purposes. In 2007, the Department of Agriculture sponsored research into the conversion of crude coconut oil to biodiesel (PDA News, 10 November 2007).

Imported foods are being diverted to nonfood uses, particularly animal feeds. In 2006, nearly 15 percent of imported foods valued at $480 million were fed to animals and aquaculture species, at an average cost per head that exceeded the average monthly food basket for a poor household. Livestock, pets and aquaculture species consumed nearly 22 percent of wheat and other grains, nearly 27 percent of fresh foods, more than 8 percent of processed foods and nearly 19 percent of meat preparations that the government reported as imported human foods. Consider this startling fact. According to the Philippine Rice Research Institute, the country imports annually enough rice to cover about 10 percent of human consumption. At the same time, 11 percent of that imported rice is diverted to feeding farmed fish and livestock in order to produce commodities to be exported. More than 8 percent of cereal preparations are really pet foods. Statistically treated as human food in government databases are raw cereal, plant fodder, vegetable and fruit waste, and meat offal that are imported to be used in the manufacture of animal feeds. While many Filipinos cannot afford cooking oils, more than half the import costs of commodities listed as vegetable and animal oils is actually fish oil that is diverted to animal and aquaculture feeds.[52]

To complicate matters, there is growing demand for grains and other foods that can be employed to process biofuels. In his 2009 briefing for potential foreign investors, the Philippine Secretary of Agriculture announced that the government expects to expand outputs of corn, sugar, cassava, and palm oil in reaction to global demand for raw materials that can be used in biofuel production (*Fresh Plaza*, 8 June 2009). Many of these Philippine crop exports are earmarked to fulfill the country's 2007 bilateral trade agreement to supply

51 USFAS, 12 July 2004.

52 Detailed trade information available through the UN COMTRADE database was utilized to render visible the animal, pet and aquaculture feeds that are lumped with human food categories in Philippine and FAOSTAT databases.

biofuel inputs to China (Borras et al. 2007: 1560). In 2007, the government also signed a trade agreement with Spain that will foster research and development of biofuels to be exported to that country (PDA News, 27 November 2007).

In addition to human competition for cereals with animal feeds and fuels, people must also rival nonfood uses of fishery products. While so many Asians lack protein, 35 percent of the world's fish (primarily exported from Asia) is being used for nonfood purposes (FAO 2008c). While the Philippine poor and much of the middle class complain of rising fish prices and the absence of affordable shellfish and crustaceans in local markets (Interviews), nearly three-quarters of the fishery imports are diverted to aquaculture feeds.[53] Milkfish, a traditional Philippine staple food, is increasingly removed from the human food chain. Tuna companies absorb 10,000 milkfish fingerlings weekly in their capture fishing (*Manila Bulletin*, 24 October 2005). However, intensive farming of carnivorous fish and shellfish redirects far more seafoods away from people. Even though governments advocate aquaculture as a strategy to conserve natural resources, fish farming heavily exploits wild resources (Goldburg 2008: 186). Though protein and iron shortfalls are widespread, the Philippines diverts fish and cereals from human consumption to supply aquaculture and livestock. Most of the wild species consumed by aquaculture are small fish species that have formed part of the human diet throughout Asia. Although small species (e.g., sardines, anchovies, mackerel, menhaden) account for only 37 percent of all the fish in the world's oceans, they are disproportionately targeted to support fish farming (Barraclough and Finger-Stick 1996). Consequently, aquaculture "drains the seas to feed the farms" (Pauly et al. 1998: 861).

In 1979, small Philippine fish were still primarily consumed by humans, but they comprised only 12.2 percent of the country's total fish catch. By 2005, these small species accounted for nearly one-quarter of capture fishing, reflecting the diversion of these food fish into aquaculture and livestock feeds.[54] In addition, small shellfish, bivalves, and mollusks are fed to shrimp and crabs, diverting these natural protein sources from traditional human consumption (Siar and Caneba 1998: 57). The situation is even more alarming when we take into account the inefficiency of aquaculture systems. Indeed, fishponds and other aquaculture technologies consume far more resources than they produce, for three inputs are needed for every unit of food produced. In the Philippines, a shrimp must be fed three times its mature weight, and one kilogram of marketable finfish requires two to five kilograms of wild fish. The cages that are concentrated in the country's new mariculture parks will devour enormous

53 Analysis of Philippine Annual Fisheries Profile (2006–2010).

54 Analysis of Philippine Annual Fisheries Profile (1979, 2005, 2008).

amounts of seafood because the 10,000 fingerlings in a typical cage need to be fed 50,000 kilograms of smaller fish (*Sun Star*, 23 April 2005). This represents a "net loss of protein in a protein-short world," as enormous amounts of wild resources are squandered (Emerson 1999: 4).[55]

In addition to their diversion to aquaculture, small fish are also captured for other nonfood uses. More than 90 percent of these captured fish are transformed into fish oil and fish meal. Encouraged by the Food and Agriculture Organization (1986) in the 1980s, the industries in fish oil and fish meal generate two of the most internationally traded commodities. Nearly 92 percent of these fish byproducts are employed in aquaculture and animal feeds, including pet foods (Staniford 2002: 11).[56] The annual global production of seven million tons of fishmeal and one million tons of fish oil requires an annual catch of 25 to 30 million tons of wild fish (Jackson 2005). In 2007, sardines accounted for 5.3 percent of total capture fish production in the Philippines, and more than half of these small fish were destined to become fish oil and fish meal.[57] Increasingly, we can expect to see fishoil diverted into biofuel production (*Pacific Business News*, 9 April 2004). In 2007, the Bureau of Fisheries and Aquatic Resources began to explore the export of its "new rising star export fish," Pangasius, for conversion into biodiesel (Philippine Annual Fisheries Profile 2007).

Globally, pigs and poultry consume more than double the seafood eaten by the Asians who produce most of these nutrients (Alder and Pauly 2008: 92). While Filipinos suffer protein shortfalls, nearly 200,000 metric tons of wasted feed fish collect below aquaculture pens and cages (Philippine Annual Fisheries Profile 2007). In short, fish farming absorbs more fish and shellfish than all the country's poor people. Indeed, fish, shellfish and animals "raised in the Philippines for the market are better fed than most people" because these commodities "are used to meet the protein needs of the privileged sector [of the country's population] and the foreign market" (Constantino 1988: 40).

4 Class Polarization and Inequalities in Food Access

In addition to national prioritization of food exporting over domestic consumption, Philippine class inequalities cause food insecurity for some sectors of the population. Kwiatkowski (1998: 33) maintains that Philippine

55 A typical fish cage is 10 meters by 10 meters by 4 meters. In their natural state, milkfish and tilapia are vegetarian, but these farmed fish consume feeds blended with fishmeal, fishoil, and/or meat offal to speed their growth to maturity and to increase their size.

56 Cargill Corporation utilizes fish oil to produce Purina Dog Chow in the Philippines.

57 Analysis of Philippine Annual Fisheries Profile (2008).

malnutrition is "due primarily to historically developed political and economic relations that created extreme social class inequality and unequal access to basic food resources, land, employment, and health services." As a result of its growing debt, the average gross domestic product per capita is shrinking, and poverty is rising (Escobar 2004: 17). Cristina David and Arsenio Balisacan (1995: 240) argue that "poverty reduction has been so slow that the country has become the region's basketcase." As a result of the country's limited and erratic economic growth since 1998, the International Labour Organization estimates that two-fifths of Filipino adults remain outside the official labor force, primarily engaged in informal sector activities.[58] The resulting poverty has a feminine face. The proportion of female-headed households is steadily rising, and more families are dependent on income generated by female members. Women's earnings in the informal sector comprise about one-third of total household income. Nearly six of every ten women workers are in the informal sector, primarily working as home-based contract laborers or as operators of micro-enterprises, such as small variety stores, vegetable peddling, or crafts sold on the streets. Another one-quarter of women toil as unpaid family workers in agriculture, retail trades or personal services (United Nations 2003). Since 2000, the country has been plagued by a soaring school dropout rate and a growing population of child laborers. More than 2 million Filipino children work in dangerous environments while the street children population has increased sharply. One of the effects of neoliberal privatization policies has been a decline in national budgeting for public education, so the government shifts to parents 40 percent of the cost of elementary education. Only 65 percent of Filipino children finish the sixth grade while less than 50 percent complete a secondary education.[59]

Agricultural households are the poorest families in the country. More than 30 million Filipinos live below the poverty line (Bello and Dorcena 2004), and households in rural areas are more likely to be impoverished than urban dwellers. Nationally, 40 percent of the population is poor, compared to 54.4 percent of those in the countryside. The mean income of rural households is only 52 percent of the mean urban household income. Unemployment and underemployment are also higher in the countryside, and there are stark divides between urban and rural women with respect to waged opportunities. Only two-thirds of rural working age people are gainfully employed, but women are more likely to be unemployed than males. Less than 47 percent of rural females are employed in waged jobs. Those who live in the countryside also spend more

58 See www.ilo.org/manila/areasofwork/informaleconomy/langen/index.htm (accessed 3 Oct. 2021).

59 Analysis of Quikstat (Module 7).

on food than city dwellers. While urban Filipinos expend 40 percent of their household budgets on food, rural families utilize 52 percent of their funds on food. Consequently, income inequality is also greater in the countryside where the richest decile of rural dwellers earns three times more than the total income of the poorest 30 percent. Nearly 26 percent of rural families lack adequate food intake, compared to 7 percent of urban families. In other words, rural households are nearly four times more likely to be impoverished than the urban Philippine households that consume part of their agricultural and fishery outputs.[60]

In comparison to Thailand, Indonesia, China and Vietnam, the Philippines exhibits greater wealth concentration and income disparity. Nearly 40 percent of the total national income is held by the top decile of richest households, but wealth and income are even more concentrated in northern Mindanao. The highest income group consists of only 0.2 percent of the population, and the middle income group accounts for less than one-fifth of the population. According to Philippine economist Sixto Roxas, the lifestyle of the richest decile generates "delusions of national prosperity.... The first tier is often described as if it were the entire country when it is a minority. ... It is possible for the first tier to show great progress while the conditions of the other two tiers continue to deteriorate" (*Philippine Daily Inquirer*, 3–4 March 1990). In the face of rising prices, the middle class shrank between 2003 and 2007 (Virola et. al. 2007). National policymakers acknowledge that "benefits from economic growth and production resources are distributed unequally, with more going to the rich than to the poor" (Republic of Philippines 2000: 146). Concentrated in insulated affluent urban enclaves, Philippine elites and upper middle classes are at great social distance from the poor. Nearly three-fifths of such elites blame the poor for their poverty, insisting that they do not work hard enough or are too ignorant to raise themselves to a higher level. Even though such anti-poor stereotypes are often reflected in public policies, these notions are grounded in erroneous assumptions about the country's poverty trends. Most elites hold the misguided belief that the rural poor are better off because they have easy access to plentiful resources. One government official publicized the inaccurate perception that "there's a lot of opportunities in the countryside. ... There are a lot of resources there if people only work, be industrious" (Clarke and Sison 2003: 221, 230). In reality, nearly 80 percent of the Philippine rural population is low-income (Virola 2008), and a majority of the country's poor are concentrated in rural areas where only one-third of the families earn wages (Krinks 2002: 81).

60 Analysis of Quickstat (Modules 1, 9).

In the face of the harsh realities of widespread poverty, peso devaluations, income inequality, and elite anti-poor policy formation, food prices have steadily risen since 1990. The 2008 National Family Income Expenditure Survey reports that 80 percent of Philippine households spend less than $1 per meal daily (Gordon 2009), an indication that both the poor and much of the middle class are being impacted by inflation. Indeed, food prices have escalated 153 percent since 2000, and grains have inflated to a greater extent than other foods. In 2010, fish prices were 150 percent of their 2000 levels and had escalated to a greater extent than other meats.[61] The World Bank (2009: 4–5) maintains that rising prices have an inequitable impact on the poor because of the operation of the *poor person's food index*. "More of a poor person's budget is spent on food than the average consumer in the same country, so food price increases affect them more. ... In most countries, poor people face an effective inflation rate nearly 3 percentage points higher than the overall average. Food price increases have eroded poor people's purchasing power. ... In effect, poor people have grown poorer [and] the poverty gap has increased." In fact, half of rural households are unable to meet basic food needs (Krinks 2002: 81). Rural households are 1.7 times more likely to experience rice shortfalls than urban Filipinos (Menguita-Feranil 2007: 5), and rural households consume very low levels of fishery products (Interviews; Philippine Annual Fisheries Profile 2009). While "the well-to-do shift to a more advanced-country-style consumption basket with a larger weight for animal products," the food basket of the rural poor provides a much lower calorie intake (Ghosh and Chandrasekha 2003: 285).

5 Looking to the Future

In this final section, we will explore four questions about future Philippine food security:

1. Will the country continue to prioritize exports and nonfoods over local consumption?
2. Will the country break its food import dependency?
3. Will the country confront the ecological degradation that threatens its food security?
4. Is the Philippines likely to become more food secure in the early 21st century?

61 Analysis of prices and food balance sheets, FAOSTAT. The base year is 2000.

5.1 *Future Export and Nonfood Strategies*

The Mid-term Development Plan (Republic of Philippines 2000) offers no evidence that the country will stop prioritizing exports and nonfoods over domestic consumption. In 2009, a Philippine economist naively contended that the country should "look beyond" domestic food crops that are "not our comparative advantage. Importation is not that bad" (*Philippine Business Mirror*, 8 June 2009). On the one hand, this economist has not noticed that the Philippines holds no regional or global "comparative advantage" in any of the agricultural or fishery commodities that it exports, as indicated by intense regional competition, declining prices and the country's falling global standing among the world's export fisheries. "Despite declining competitiveness of the country's leading export crops, the government continues to blindly promote export crop production" (Pascual and Glipo 2002: 7). On the other hand, this economist is dismissing the health threats that are deriving from globalization of unhealthy western diets, as analyzed by Philippine National Nutritional Surveys, the World Health Organization, and several NGOs.[62] However, the government's export targets are in accord with this outdated thinking, and the policies of the Department of Agriculture do not reflect recognition of the dangers associated with ignoring domestic food security. Instead, the Philippine government continues to prioritize expansion of aquaculture, a limited array of cash crops and nonfood land uses. The Philippine government is committed to the opening of more than 13.5 million hectares of new lands in the early 21st century (see Table 12), but less than 7 percent of these new lands will target production for local consumption. Only 9 percent of these lands are allocated to expanded export food production while the rest will be used to expand nonfood exports, including 62 percent of land use for timbering and other nonfood purposes, 15 percent for biofuels, 10.4 percent for cultivation of nonfood crops, and 2 percent for production of animal and fish feeds. Most of these new lands will derive from privatization of public grasslands and mangroves, as well as the dispossession of indigenous peoples from their ancestral lands. Reallocation of public commons and indigenous lands will remove from domestic consumption all the food gathering and cultivation that occurs there. Nearly 9 percent of these new land uses will result from reallocation of existing lands that produce crops for domestic consumption. Since the legislation specifies the origins of only 77 percent of the new hectares, it is likely that more current food-producing areas will be directed to nonfood uses.

62 For example, the EAT-Lancet Commission on Food, Planet Health and the Global Dietary Database funded by the Gates Foundation.

Even though the Food and Agriculture Organization (2008b) warns that biofuels pose a threat to the world food supply, the Philippine government hopes to export greater amounts of the country's future corn, sugar, cassava, seaweed, coconut oil, palm oil, and smaller fish for this purpose. At his 2009 public briefing for foreign investors, the Philippine Secretary of Agriculture announced that the government has set the goal of expanding agricultural crops that can meet the demand for biofuels. By 2015, he claims, the Philippines will export increased levels of corn, 10.3 million tons of sugarcane, 14.4 million tons sorghum, and 4 million tons of cassava for this industrial purpose. He also expects the demand for the country's coconut oil to increase, as richer countries begin to use it as a biofuel (*Fresh Plaza*, 8 June 2009). Fish oil is also being employed as a biofuel in some countries (FAO 2008b), so this new form of nonfood consumption is likely to drain away even more of the country's smaller fish that are important food sources for the poor. In 2004, biofuel crops were being grown on about one percent of the world's arable lands (ESCAP 2010), but the Philippines is targeting a higher proportion of its future farmlands for cultivation of crops that will generate methanol for export (see Table 12).

These export agendas are not likely to generate any greater economic growth or improvement in quality of life than they have in the past. The Philippines has been a net importer of agricultural products since 1994, and there is little probability this trend will change. In its Medium-Term Development Plan, the government admits that economic growth rates in agriculture have not kept "apace with those of its neighbors," and that export agriculture "has had a very limited impact, so far, in reducing rural unemployment, underemployment and poverty," which is severe at 4 million unemployed and underemployed (Republic of Philippines 2000: 24–26, 29). Despite its recognition of economic, social, political, and ecological problems that have resulted from the country's export strategies, the Plan sets new goals that gamble the country's food supply on the irrational dream of capturing foreign exchange that has not materialized in past years. This development agenda is grounded in ideological commitment to traditional notions of comparative advantage, but the achievement of specialized commodity niches has eluded the country for decades. Politicians and economists are quick to point the finger of blame at population growth, making inaccurate claims that human numbers have outstripped the capacity of the country to feeds its people. As we have shown, analysis of official government data belies such Malthusian rhetoric. Indeed, the Philippines has not emphasized the production of rice or any other agricultural or fishery crop for domestic consumption. Instead, the government and many Philippine economists prioritize redirection of scarce resources into commodities that are in demand in world markets, in order to produce exports that will earn foreign exchange to repay external debts and to purchase food

imports. Even though this approach has failed the Philippines miserably, these export priorities have been concretized into 21st century national development policy (Republic of the Philippines 2000).

5.2 *The Risk of Food Import Dependency*

Every year since 1994, the Philippines had a trade imbalance, even in years when it has exhibited economic growth.[63] Between 1982 and 2003, the country experienced surges in 120 food imports that negatively impacted domestic agricultural and fishery production (ESCAP 2010: 49). In 2008, the value of exports was 3.6 times 1994 levels, but the county had a 15.6 percent trade deficit, and its external debt was equivalent to 65 percent of GDP. The country's agricultural track record over this period is even worse. In 2008, the Philippines exported commodities valued at 3.3 times the 1994 agricultural exports, but it still showed an 80.2 percent trade deficit. Despite the government's commitment to diversion of farm lands to export "high-value" export crops, the Philippines has experienced higher trade deficits in agricultural commodities than in other sectors. The trends with respect to food are even more grim. In 1994, the country's only trade surplus occurred in food exports. By 2008, the country's food exports were valued at 4.3 times the 1994 level, but the value of imported foods exceeded the value of "high value" food and fish exports. By 2016, the Philippines was expending far more on food imports than it earned on its nonfood exports that utilized thousands more hectares than crops for domestic consumption.[64]

In a shocking manner, 2008 proved to be a significant test year for the country's economic ideology. Due to several global circumstances, grain prices rose sharply, so cereals were the fourth most expensive Philippine import.[65] The government's economic ideology does not take into account two significant dangers associated with its export goals. First, the country cannot naively assume that it will be able to buy in the world market the foods it needs– even if it acquires enough foreign exchange to break even on such purchases. The 2008 global crisis underlines an obvious flaw in reliance on food imports. Countries can and do stop producing and exporting commodities, as occurred during the 2020 COVID pandemic (see Chapter 7). Only about 5 to 7 percent of total rice production enters the global market in a high production year (Harden 2008), and countries restrict export of this grain in low-supply years (FAO 2008a: 4–5). Among Asian and Pacific countries, 25 are rice importers while only 12 are exporters. After India and Vietnam tightened export restrictions in early 2008, the price of rice increased 184 percent. Even after price

63 Analysis of exports and imports, 1994–2019, UN COMTRADE database.
64 Analysis of exports and imports, UN COMTRADE database.
65 Analysis of Foreign Trade Statistics, OpenSTAT.

TABLE 12 Philippine food insecurity through land redistribution

Part A. Proposed land use goals for the early 21st century

New land use goal	Hectares	% of new lands
Privatize public forestlands for development	8,400,000	62.1
Recruit foreign investment in biofuels	1,813,500	13.4
Export nonfood crops	1,412,050	10.4
Rice cultivation	875,130	6.5
Export food crops, livestock and poultry	337,890	2.5
Corn for livestock, pet and aquaculture feeds and biofuels	280,250	2.1
Palm oil for biofuels and industrial uses	220,790	1.6
New fishponds	193,210	1.4
Total New Land Use Commitments	13,532,820	100.0

Part B. Where will new crop and fishpond hectares be found?

Land Use	Hectares with New Land Uses
Restructure nonfood croplands for increased outputs	unstated
Privatize public grasslands	404,000
Privatize public mangroves through leasing	120,000
Privatize public forestlands for development	8,400,000
Privatize ancestral Lands of Indigenous peoples	unstated
Restructure crops on existing lands that are now growing rice, vegetables, roots, tubers	1,260,250
Reactivate abandoned fishponds	176,000
Expand fishponds in coastal and inland waters	17,210
Intensify aquaculture in coastal and inland waters primarily using fish cages	unstated
Total new hectare commitments specified in the legislation	10,377,460

SOURCES: NEW TARGET HECTARES INCLUDES NATIONAL DEVELOPMENT GOALS (REPUBLIC OF PHILIPPINES 2000: 40–54), TRADE AGREEMENTS POSTED AT GOVERNMENT WEBSITES AND PHILIPPINE NEWSPAPER ACCOUNTS THROUGH DECEMBER 31, 2009. ABANDONED FISHPOND AREA DERIVED FROM NICKERSON (1999), PHILIPPINE ANNUAL FISHERIES PROFILE (2005) AND WORLD BANK PHILIPPINES (2003). REGARDING ANCESTRAL LANDS, SEE REPUBLIC OF PHILIPPINES (2000: 153)

declines as more rice entered world markets, rice cost twice as much in September 2008 as it had in November 2007 (ESCAP 2010: 44, 78). Moreover, worldwide trends show a shift toward greater production of other grains, with the probable outcome that there will be less available rice in the future (Chand 2008). Second, the government's future agriculture targets are not grounded in a realistic assessment of the risks and costs of being oil-dependent. Philippine agricultural goals require that exports be transported great distances inside the country, and hybridized agricultural intensification requires petroleum-based imports that continue to escalate in price. In 2008, the world's attention was upon the Philippine need to import rice that was in short supply in the world market. However, that was *not* the commodity that absorbed most of the funds expended on imports at the peak of this global grain crisis. Rather 24 percent of the cost of the country's imports lay in petroleum, mineral fuels, and petroleum-based chemicals while less than 5 percent of import expense was caused by rice. The country expended $5.25 on mineral fuels and petroleum-based agricultural chemicals to every dollar it spent for rice to be eaten by its people.[66]

Reliance on food imports is also unsustainable because of the long-term exacerbation of poverty and unemployment. Ignacio (2005: 6) explains that:

> It is socially irresponsible to prescribe that opening up the domestic market to agricultural imports will make local agriculture competitive. The ultimate result of such drive to competitiveness is to reduce the number of farmers by increasing farm size and replacing farm labor with machineries which of course will eventually result in displacement of millions of farmers and farm workers. In the case of the Philippines, there are very limited economic opportunities for excess rural labor due to the very slow growth in the manufacturing sector, which is dominated now by food processing. Overall prospects for increased employment opportunities in the industrial/manufacturing sector is also quite dim given... that free trade is actually resulting in de-industrialization.

5.3 *Ecological Degradation and Food Security*

Has the Philippine government set goals to alleviate the types of ecological degradation that threaten future food security? As reflected in its Mid-term Development Plan, the Philippine government is quite aware that its past export strategies have resulted in land conversions from rice and foods for local consumption, widespread soil erosion, loss of irrigated farmlands, extreme

66 Analysis of imports, UN COMTRADE database.

stress on fisheries and coastal areas, loss of 66 percent of forests and severe ecological impacts from mining. Moreover, Philippine biodiversity is "considered to be among the most threatened in the world." As a result of past ecological exploitation, nearly half of all agricultural lands are moderately to severely eroded, and numerous plant and fish/shellfish/crustacean species are at risk of extinction. "Widespread loss of mangroves, living corals and sea grasses has severely eroded the capacity" of the coastal and marine ecosystems "to support life." The country's watersheds and bays have been severely degraded, and six river systems are biologically dead (Republic of Philippines 2000: 14–30). Suh and Pomeroy (2012: 12) estimate that future climate change will cause a 9 to 18 percent decline in Philippine GDP and a 4 percent decrease in household income. Chapter 7 provides more in-depth analysis of climate change.

Has the government set goals to alleviate such ecological degradation? Quite the contrary, the development plan focuses on overcoming "the underutilization of the country's abundant natural resources." Consequently, the plan sets early 21st century goals that ignore environmental degradation and intensify past patterns of exploitation of ecosystems. In order to "create a climate conducive for investments and production," the government seeks to "identify idle resources" and to "manage them more efficiently" as part of a "market-driven strategy" that will "maximize exports and investment opportunities offered by trade agreements" (Republic of Philippines 2000: 17–18, 43–54). The Philippine state intends to:

1. accelerate privatization of public lands;
2. promote more leasing of mangroves for aquaculture expansion;
3. open 8.4 million hectares of public forests to timbering and other private development;
4. develop 2 million hectares of new land for large agribusinesses that employ contract farming;
5. utilize more "idle off-shore and inland bodies of water for aquaculture;"
6. move further away from crop and species diversity toward deeper monocultural agriculture and fisheries that are organized around "One Town One Product" specializations;
7. make "underutilized farmlands" more productive through "increased cropping intensity" and wider use of genetically-modified species, fertilizers and pesticides;[67]
8. and expand mining through a "National Mineral Action Plan" because "94.4% of mineralized areas have yet to be developed."

67 The Philippines is one of only four Asian countries that plant significant amounts of genetically-modified crops; the other three are China, India and Australia (ESCAP 2010: 67).

5.4 *Outlook for Future Food Security*

Is the outlook for the country's food security likely to improve in the early 21st century? In reality, the country is moving further toward food insecurity. The Economic and Social Commission for Asia and the Pacific (2010: 8, 40, 59–72) pinpoints five elements of Philippine future development goals that will exacerbate unsustainable agriculture and food insecurity: (1) dependence on genetically-modified crops and imported agricultural inputs, (2) privatization of public lands, (3) depeasantization. (4) shrinking forests, and (5) biofuel production. Moreover, the Royal Swedish Academy of Sciences warns that new aquaculture technologies "are unlikely to lead to a sustainable industry" (Lebel et al. 2002: 311). Because of the growing organized political opposition to aquaculture in the US, Canada and Europe, these richer countries will increasingly externalize the ecological costs of fish farming to Asian countries (Platon and Israel 2001: 12).[68] Even though nutritional deficiencies are exacerbated by food exporting, the country ships out a significant proportion of its most nutritious crops and fishery resources and displaces traditional food staples. Despite the country's widespread protein and iron deficiencies, the country sells internationally near one-quarter of dressed chickens, nearly one-fifth of finfish, as much as one-half of shellfish and crustaceans, and a high proportion of the small fishes that are used to generate fish oil abroad. The best foods to overcome pervasive vitamin and energy shortfalls leave the Philippines for distant world markets, including half the banana production, nearly one-fifth of other fruits, more than 11 percent of vegetables, and a majority of the oils that could be used for cooking. Even part of the rice output is exported, mostly concealed in processed cereal preparations.[69]

More than 90 percent of new land use creation is targeted for nonfood uses and exports (see Table 12). Thus the country's 2000 development plan ignores production for local consumption while setting goals in such a way that traditional staple foods will continue to be threatened and displaced (Republic of Philippines 2000). In fact, the plan not only allocates most of its newly created croplands to nonfoods, but it also targets restructuring of existing lands and fishponds and the privatization of forests, mangroves and indigenous ancestral lands that have provided foods for local consumption. Even though agricultural and fishery outputs have increased, food insecurity has worsened

68 For examples of organized opposition to aquaculture in the US, Canada and Europe, see https://watershedwatch.ca/, https://ecotrust.org, and www.davidsuzuki.org (accessed 3 Oct. 2021).

69 Export levels were calculated by comparative merging of data from OpenSTAT and the UN COMTRADE database.

since 2000. Philippine food shortfalls have been severe enough that the country averages annual international food aid of 110,204 metric tons. Furthermore, the United Nations began to rank the Philippines as one of the world's "hunger and food insecurity hotspots" in 2009 (ESCAP 2010: 29, 66).

As poverty deepened between 2013 and 2015, nearly two-fifths of families lived in substandard housing, 1.2 million households lacked access to safe water, 1.8 million households had no sanitary toilets, and less than 5 percent of the population was served by sewerage systems. Between 2010 and 2015, malnutrition worsened, and more than two-thirds of households exhibited per capita micronutrient intakes that fell below daily requirements. Moreover, the proportions of underweight, stunted and wasted children increased. One of every three children (3.8 million) was stunted, but stunting was much worse among poor and rural households. The incidence of stunting was 3.3 times greater among the poor than among the wealthiest households (PNAPC 2017: 15–16). In 2015, only 31 percent of households were meeting recommended protein intake, and more than one-fifth of children were Vitamin A deficient. In 2019 and 2020, the country's national nutrition survey reported that two-thirds of households suffered moderate to severe food insecurity. Nearly 42 percent of these households had no money to buy food, and one-fifth of adults decreased their own intake in order to feed children. Feeding programs specific to children declined sharply, and the government-sponsored micronutrient powder was made available to less than 11 percent of children younger than five. Breastfeeding rose to 60 percent of infants, and nearly one-third of mothers indicated that their children older than five had lost weight. Only one-fifth of pregnant women received minimum acceptable diets in terms of dietary diversity and daily feedings.[70] For all these reasons, the Global Hunger Index (Concern Worldwide 2010–2019) for the Philippines has remained "serious" since 2010, with no signs of government commitment to effect future long-term policy changes.

70 Analysis of Philippine National Nutritional Survey (2005, 2015, 2019, 2020).

CHAPTER 4

Commodity-Chained Peasants

Construction of the Philippine Food Extractive Enclave

Abstract

We investigate what has happened to the communities and the peasants of an Asian fishery in the wake of debt-driven development strategies. Since the early 1980s, Philippine policymakers have advocated an "agribusiness approach to countryside development" that prioritizes larger enterprises, fewer independent peasants and production of a limited array of export crops and fishery products (Republic of Philippines 2000). As a result, the ecological resources and peasant laborers of fisheries have been integrated into the global food system. We examine the commodity chains for shellfish, finfish and live reef species, through which regional brokers and commission merchants orchestrate the transfer of exports to national and global wholesalers and processors. Regional re-orientation of productive assets to prioritize exports has had four significant impacts on peasant communities: depeasantization, ecological degradation, loss of livelihood, and food insecurity.

> Mindanao is the virgin resource paradise of the Philippines.
>
> (InvestMindanao Blogspot)

• • •

> Make Mindanao the country's main agro-fishery export zone.
>
> (Philippine Medium-Term Development Plan, 2000–2010)

⁘

It is in the troubled subregion of Mindanao, the largest Philippine island, that this fishery case study is situated. Even though the proportion of hungry Mindanao households more than quadrupled between 1998 and 2017, the government continues to target the island for agricultural crops (mostly nonfoods),

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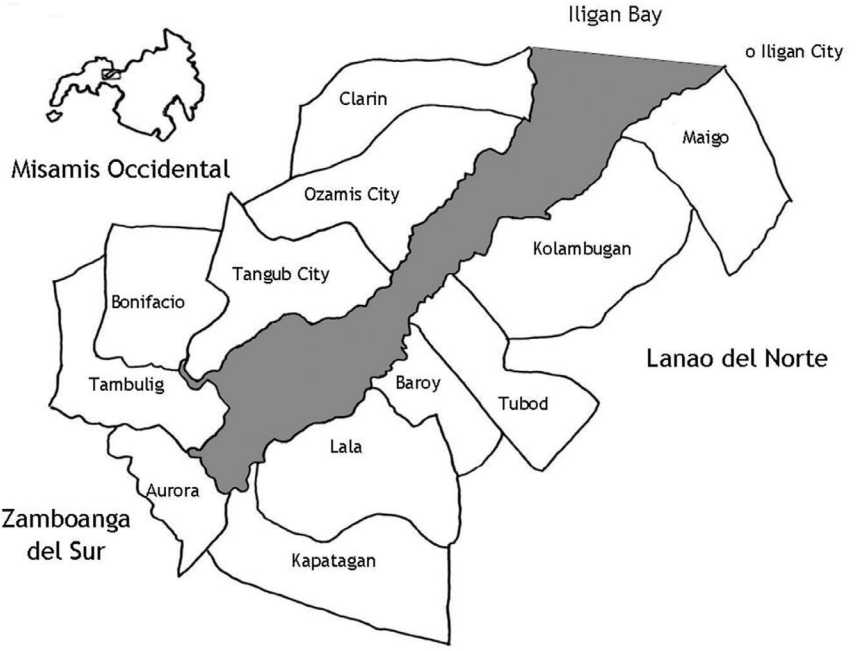


FIGURE 12 Municipalities in three provinces surrounding Panguil Bay in Northern Mindanao

capture fishing and aquaculture for export.[1] To fuel its export growth agenda since 1980, the Philippines has exploited the rich ecological resources and farmlands of Mindanao. This island is pivotal to national economic growth goals because it generates 40 percent of agricultural crops, 42 percent of the country's seafoods, and vast amounts of minerals and timber. In its Medium-Term Development Plan (Republic of Philippines 2000: 34), the government targeted Mindanao to be the country's primary agro-fishery export zone. In 2007, northern Mindanao was the second fastest growing regional economy in the country (*Philippine Sun Star*, 26 July 2007). It is within the context of northern Mindanao's past and contemporary high-pressure development agendas that we will examine the transformations that have occurred in the food extractive enclave we have chosen to examine. Located in northern Mindanao, (see Figure 3) Panguil Bay is surrounded by ten municipalities and two cities in three provinces (see Figure 12). The Bay and its fishery resources provide food and livelihoods to more than 11,000 registered full-time fishers,

1 Analysis of Philippine nutritional surveys (PNFRI 1994, 1999, 2017). Throughout this chapter, all monetary values are $US.

as well as thousands of undocumented part-time fishers, in 78 small coastal communities. These communities supply agricultural crops, industrial outputs, and vast amounts of fish and shellfish to the country's GDP.[2] Because it is one of Mindanao's richest ecosystems, Panguil Bay was transformed into a *food exporting enclave* through nationally-set development goals. In the sections that follow, we will examine the restructuring of three major regional food production systems: agriculture, capture fishing, and aquaculture.

1 Transformation of Panguil Bay Agriculture

Agricultural households are the poorest families in the Philippines, and agrarian reform has not succeeded at redistributing land to a majority of peasants (Ledesma 1982; Putzel 1992; Borras 2007; Borras et al. 2007). "The hacienda system still persists in the country, where large estates are farmed by sharecroppers. More than half the population are peasants, and 20 percent of the population own 60 percent of the land. Although the sharecropper is supposed to receive half the harvest, most of the peasant's actual income goes toward paying off the debts incurred with the *cacique*, the landowner" (*Third World Guide* 2001: 438). According to the Asian Development Bank (2005: 60–61), "landless sharecroppers often depend on large landowners for credit to cover as much as 80 percent of the required farm inputs, such as seed and fertilizer."

In its development plan for the 1990s, the government prioritized the conversion of more than 3 million rice and corn hectares to export crops, spurring land conversions in the Panguil Bay provinces (Republic of Philippines 1992). In its plan for the first decade of the 21st century (Republic of Philippines 2000), the government set new export targets for production of crops with "high-value" global demand and called for livestock output increases to spur growth in export food processing. To implement these goals, the government sought foreign agribusiness investments in northern Mindanao and Panguil Bay in (1) cattle, hog and chicken production (primarily through contract farming); (2) livestock feed milling; (3) meat processing; (4) cultivation and processing of fruits and vegetables with high global demand; (5) refurbishing of existing tree plantations (coconut, bananas, rubber) through introduction of new varieties; (6) expansion of ornamental horticulture and (7) biofuels production. Nationally between 1995 and 2008, the value of exported meats and meat preparations increased tenfold while the value of exported vegetables

2 Analysis of crops, OpenSTAT; Philippine Annual Fisheries Profile (1978–2015); MSU Naawan Foundation (2006).

and fruits nearly doubled.[3] Since 2006, the government has subsidized and sought foreign investments for new industrial tree plantations (especially oil palm) and has targeted some traditional food crops (e.g., cassava) for biofuels production (Republic of Philippines 2000: 29–36). In the 2010 national development plan, two million additional hectares were targeted for agribusiness production in biofuel crops and oil palm (Gironde et al. 2016: 117). Consequently, "a rural proletariat has emerged to work as contract labourers on plantations owned by large landowners or controlled by major multinational corporations" (Ness 2021: 33–34). Since 2010, domestically-cultivated sugar has been redirected into the production of bioethanol (*Manila Times*, 20 Jan. 2010).

1.1 *Declining Cultivation of Cereals*

The Philippines replicated patterns of export agriculture throughout the Global South. Historically,

> trade in primary products entails extreme costs for the exporting country because it leads to the decline in the output and availability of basic food staples. ... The inverse relation– between rising agricultural exports and falling domestic food grain availability– is repeatedly seen... in every case of the trade liberalisation of a developing country. (Patnaik 2011: 34)

Food crops for local consumption have been marginalized and devalued by Philippine development goals, and the export goals exceeded the available land along Panguil Bay. As a result, these national agendas spurred legal and illegal conversions of food crop lands. Nationally between 1995 and 2007, there was an 8.5 percent increase in croplands, but the Panguil Bay area lost more than 14 percent. The number of regional farms decreased by nearly 3 percent, and the average size of farms diminished to 2.7 hectares (NSO 2004). Most of those regional cropland losses occurred in cultivation of rice, causing higher rice shortfalls per capita than is true for the country as a whole. Nationally between 1995 and 2009, ricelands increased by nearly 21 percent, but Panguil Bay provinces were committing 9 percent fewer hectares to rice cultivation by 2009. Even though Misamis Occidental farmers cultivate vast highly-visible tracts of rice, this province commits only 12 percent of its cropland to grains. In the two municipalities of Aurora and Tambulig, there is only about 0.3 hectare of rice to every hectare of bananas and coconuts. Because of land conversions

3 Aggregation and analysis of exports, UN COMTRADE.

and ecological degradation since 1990, this region has been transformed from rice self-sufficiency to a zone that is dependent on rice imports.[4]

Panguil Bay provinces suffer more limited access to dietary grains than does the rest of the country. Since 1995, the Philippines has employed hybrid seed varieties on fewer hectares to generate a 21 percent increase in rice production. Over the same period, Panguil Bay rice production declined 2 percent. On the one hand, regional provinces have not benefitted equitably from the national irrigation program. Regional irrigated farm area declined 22.4 percent between 1990 and 2008, so only about 13 percent of regional farms were irrigated (NSO 2004).[5] On the other hand, many rice farmers are too poor to afford the higher-yield hybrid rice seeds and chemical inputs that must be utilized if farmers are to be eligible for government subsidizes and credit (Interviews).

Similar declines have occurred in corn, the primary grain consumed by one-third of Bay households. Nationwide, corn lands declined very little between 1995 and 2009, but Panguil Bay corn hectares diminished by nearly 15 percent. While national corn production expanded 70 percent, regional output increased only 7.5 percent. Nationally, land use for grains increased more than 10 percent between 1995 and 2009, accompanied by a 62 percent rise in production. In contrast, Panguil Bay provinces lost nearly 11 percent of their grain lands, so the region exhibited less than a 3 percent increase in outputs. Local officials and NGO staff reported that some corn hectares were converted to fishponds in the 1990s. Moreover, the tradition of planting corn beneath coconut trees has been increasingly abandoned. Despite these trends, Panguil Bay provinces export grains through regional brokers. Nationally, the value of 2009 exported cereals and cereal preparations was five times greater than the 1995 level, driving the transfer of grains to Manila for processing and re-export. Throughout northern Mindanao, most of the rice is "sold through middlemen *without* a fixed price. A large quantity of rice production is transported outside the region through several middlemen who purchase the product at farmgate prices. Only a few farmers sell their produce to the National Food Authority (PDA 2009b: 2)."[6]

4 Analysis of land utilization and food balance sheets, FAOSTAT. Analysis of provincial and municipality websites (accessed March 2017). Aurora and Tambulig are situated in Zamboanga del Sur province.

5 Analysis of land utilization, FAOSTAT.

6 Analysis of exports, UN COMTRADE. Aurora municipal website (accessed March 2017). The term "middlemen" accurately reflects the gender of this sector of traders.

1.2 *Prioritizing Commercial Export Crops*

National policymakers prioritize an "agribusiness approach to countryside development" that values larger farms over small producers. Following the export principle that "high-value farm crops, vegetables and fruits have higher income potential than the traditional staple crops of rice and corn," the Philippine plan (Republic of Philippines 2000: 29–34) sets goals that ignore peasants, including:

1. "pursuit of a market-driven strategy that will link supply capacity closer to the high-impact markets,"
2. promotion of national and foreign investments in agribusiness approaches and in infrastructure to support exporting,
3. "a large-scale program of non-traditional high-value crops in farms and fisheries,"
4. "increased production intensity" in existing crop, livestock and fishpond hectares,
5. reconfiguration of "existing agricultural and fishery production systems to be able to tap emerging markets with vast potentials,"
6. "value-adding through innovative packaging and agri-processing technologies" (e.g., freezing, cold storage, canning, drying), and
7. cultivation of "idle and marginal lands" (i.e., mangroves) with export fruit trees.

The government makes its intentions clear: its goal is to "transform farmlands into agribusiness enterprises." As for the people, "all these initiatives will result in the creation of a new class of farmers and fishers" who increase and diversify the marketable surpluses of their farms.[7] In short, this is a plan to *depeasantize* the country's agriculture, to concentrate most of the production into the hands of fewer larger holdings and to rationalize the labor process through greater reliance on modern technologies and imported artificial inputs. In this plan, the policymakers target "unsustainable practices" of impoverished peasant farmers, ignoring the massive levels of degradation that result from the country's largest farms and tree plantations. Since Mindanao was targeted to be "an agribusiness hub," Panguil Bay farmers have been harshly impacted.

Between 2008 and 2019, the country allocated more than one-third of croplands to rice. In the Panguil Bay region, however, rice is cultivated on less than 15 percent of all farm land. In sharp contrast to national trends, there is only one hectare of rice to every 5.6 hectares of crops that are *not* used for local

7 In its policy formulations about peasants, Republic of Philippines (2000, 2010) reflect World Bank influence. See Chapter 8 for a discussion of "the new agriculture" that was proposed by the World Bank (2007).

consumption. Following development recommendations from the World Bank and IMF, the Philippines moved toward designating "high value export crops" and toward generating the resources needed to sustain that export-led agenda. Through subsidies, research and public advocacy, the government prioritizes commodities that it claims will generate the greatest foreign exchange or provision growth in other export sectors. In 2009, nearly half of all the country's croplands were devoted to nonfood and export crops, but the impacts were worse in the Panguil Bay area. Nationally, more than 46 percent of agricultural land was being utilized for domestic crops, but only 24 percent of Panguil Bay agricultural land was growing domestic foods.[8]

In 2009, Mindanao was again targeted for an intense phase of agro-industrial development (*Mindanao Magazine*, 20 January 2009). A high proportion of the crops that the government targeted for expansion for export were produced in Mindanao (Menguita-Feranil 2007: 4). More than 43 percent of the country's farms are situated in Mindanao, producing 87 percent of the country's pineapples, 77 percent of bananas, 58 percent of coconuts, and 56 percent of corn. For that reason, the government earmarked $19.1 billion for agribusiness infrastructure and the expansion of "high-value" export cash crops in this region between 2007 and 2010 (*Minda News*, 17 June 2009). Regionally, 72 percent of farm hectares cultivated nonfood crops to generate exports and to provide feeds for the burgeoning meat, chicken and aquaculture industries.[9]

In Panguil Bay communities, coconuts are planted on nearly three times as many hectares as rice and on 1.7 times as many hectares as all crops for human consumption. Because coconut oil is one of the country's most valuable industrial exports, nearly 86 percent of coconuts are utilized for nonfood purposes. Corn is also disappearing from the human diet due to the convergence of two trends: the decline in corn hectares since 1995 and increased nonfood usage. Several mills along Panguil Bay process corn into livestock and aquaculture feeds, leaving less than 18 percent for human consumption. Cassava is another traditional food that has been redirected outside the human diet. The vast majority of this crop is exported for industrial uses, but the government has also targeted this crop for future biofuel production. As a result, less than 10 percent of cassava was available for human consumption in 2010. In addition, the region cultivates abaca (hemp), rubber, and tobacco. Because it is indigenous, the Philippines produces 84 percent of the world's abaca for

8 Analysis of land utilization, food balance accounts, OpenSTAT and FAOSTAT.

9 Analysis of land utilization, food supply and utilization and exports, OpenSTAT and UN COMTRADE.

industrial purposes.[10] In 2001, the Philippine government set national biofuel goals for expansion of palm oil tree plantations.[11] By 2006, the government was exploring the processing of corn, rice and sorghum hybrids into ethanol (Borras et. al. 2007: 1560). In 2019, one of every eighteen hectares, nearly 6 percent of the country's agricultural land, was being used to grow oil palm and other biofuel crops.[12] In addition, ornamental crops emerged in the region, as evidenced by a large flower farm we photographed near Tangub City.

By 2009, less than one-quarter of regional farmlands were being used to cultivate crops primarily for human consumption (see Table 13). Instead, Panguil Bay produced a disproportionate share of nonfood crops that fuel the country's pursuit of exports. Between 1995 and 2009, regional production of coconuts and cassava doubled while increasing only about 15 percent nationally. In addition to nonfoods, Panguil Bay communities allocate four percent of hectares to the cultivation of the government's targeted fruit and vegetable exports. In 2008, this region exported nearly 20 percent of fruits other than bananas, and almost 13 percent of vegetables, cashews and peanuts. Indeed, Panguil Bay provinces were more deeply embedded in this long-term export agenda than the country as a whole. Nationally between 1995 and 2009, fruits targeted for export increased less than seven percent while Panguil Bay fruit outputs nearly tripled. In 2009, fruits were being cultivated on more regional hectares than any other targeted food export, primarily reflecting the external marketing of nearly 60 percent of banana production. Similarly, Panguil Bay export vegetable production tripled over this period while national outputs climbed only half that much. Even though nuts targeted for export declined 24 percent nationally over this period, the output of cashews and peanuts doubled along Panguil Bay.

Panguil Bay was also nationally targeted for increased beef, pork and chicken production (Republic of Philippines 2000), and it is in this sector that regional agriculture exhibited the greatest transformation. Because regional pork is primarily consumed locally, processed hogs declined 17 percent. In

10 Analysis of supply and utilization accounts, FAOSTAT. In addition to biofuels, coconut oil is used as an additive to soap, cosmetics, automotive and industrial lubricants, and margarine. Coconut water is used in intravenous medical solutions (Shetty and James 1994). Cassava has only limited food use. A majority of the world's cassava is used in adhesives, corrugated boards, wallpaper, paper, clothing, plastics, stain removers, concrete, detergents and dusting powders (Pattron 2008). Abaca is used in manufacture of rope, stiff clothing and footwear, tea bags, meat and sausage casings, cigarette papers, and currency notes (*Agribusiness Week*, 28 April 2009).

11 USFAS news, 6 Jan. 2001.

12 Analysis of country data, FAOSTAT.

TABLE 13 Food insecurity in Panguil Bay communities, 2019

Part A. Rice insecurity	
Production MT	143,430.2
(MT milling & storage losses in processing)	(50,200.6)
(Production Reserved for Seed)	(1965.2)
(Production diverted to animal/fish feed)	(6,457.2)
MT domestic supply available for consumption	84,807.2
MT Consumption requirements to supply adequate food for local residents	108,763.9
MT Surplus or (Deficit)	(23,956.7)
Part B. Fish insecurity	
Production MT	149,815.8
(Production regionally diverted to animal/fish feed, plus wastage)	(49,439.2)
(Production exported)	(52,435.5)
MT Domestic supply available for consumption	47,948.4
MT Consumption requirements to supply adequate food for local residents	294,287.0
MT Surplus or (Deficit)	(246,412.1)

SOURCES: ANALYSIS OF SUPPLY AND UTILIZATION ACCOUNTS, RSSIS. POPULATION BY AGE GROUPS FROM OPENSTAT. WE USED REPORTED ANNUAL PER CAPITA CONSUMPTION RATES OF 126.84 KG RICE AND 38 KG PER YEAR FISH FOR PERSONS OLDER THAN TEN, WITH 71.67 KG RICE AND 19 KG FISH FOR PERSONS YOUNGER THAN 10 (PHILIPPINE ANNUAL FISHERIES PROFILE 2018: 64)

contrast, processed poultry rose more than 35 percent because the country exported nearly one-quarter of its dressed chickens. By 2010, poultry production accounted for 15 percent of the total value of the country's agricultural exports, and quail raising for export increased four-fold. Between 1990 and 2009, Panguil Bay chicken processing increased nine fold, but this regional expansion was five times greater than the national level. Most of the expansion in this sector results from regional contract farming with two multinational corporations. There were 63 commercially processed chickens to every head of cattle, and 32 chickens to every hog being grown on Panguil Bay farms (NSO 2004). These trends reflect loss of available local food sources, as the traditional pattern has been for farms to grow small numbers of hogs and chickens

for household consumption. Reflecting government export agendas, chicken processing increased four times more than fruits and vegetables that have been targeted for export.[13]

2 Transformation of Capture Fishing

Even though fish is the second most important food in the Philippine diet, government development goals since 1980 have emphasized the expansion of seafood exports. Capture fishing accounts for two-thirds of Panguil Bay fishery production. Peasant fishers target the coastal waters and rivers of their municipalities while large commercial vessels plunder both Bay and ocean waters. Even though Panguil Bay encompasses only 0.6 percent of the country's coastal water and 1.2 percent of the country's population, this region produces a disproportionate share of the country's captured fish. In 2008, Panguil Bay area fishers produced 3.4 percent of all captured fish (NSO 2007; BFAR 2008). Like the rest of the country, this region has undergone major fishery transformations over the last three decades. In 1995, capture fishing accounted for nearly 97 percent of production. By 2009, declining biodiversity had caused capture fishing to decrease to about half that level.[14]

Most Philippine and Asian scholars and policymakers use the term *artisanal fishers* to refer to small producers who engage in capture fishing in near coastal and inland waterways. Throughout our subsequent analysis, we break with that tradition to use the term *peasant fishers*. The vague category "artisanal" has been used in ways that essentialize very large populations as traditional small operators, often merging more affluent fishers who employ modern technologies with poorer fishers who rely on a few cheaper gears. To avoid this clouding of the differences among fishers and to be able to situate our research against the backdrop of contemporary depeasantization debates, we have moved away from the artisanal categorization. Since so many public policies ideologically blame small fishers for more ecological degradation than their fishing technologies can possibly cause, it is important to distinguish the impacts that different groups of fishers have on their ecosystems.

2.1 *Traditional Peasant Capture Fishing*

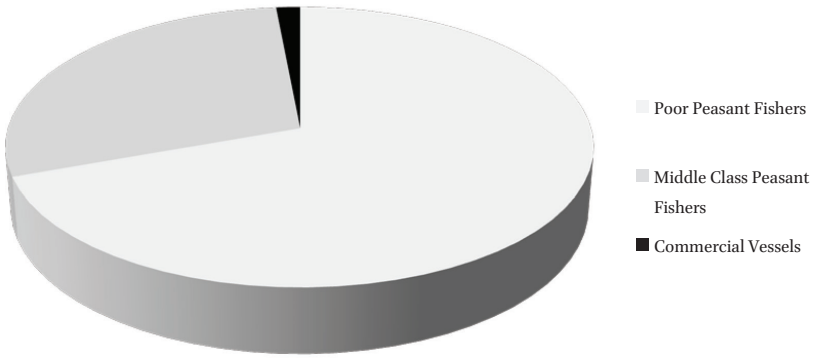
Capture fishing is undertaken by three categories of independent operators. About 29 percent are middle class peasants who rely on traders and wholesalers

13 Analysis of crop production data, FAOSTAT.

14 Philippine Annual Fisheries Profile (1995–2009).

to finance more exploitative gears that generate daily fishing incomes of $3 to $5. Another 1.5 percent of the region's fishers use large commercial vessels and ply both municipal and ocean waters. However, 69.5 percent of capture fishers are poor peasants who generate daily per capita incomes of less than $1.00 (see Figure 13). At this point, it is important to emphasize that Philippine peasant fishers mirror global trends. Worldwide, 5.8 million fishers earn less

Part A. Percentage of Philippine fishers by category



Part B. Percentage of fish captured by each category of fishers

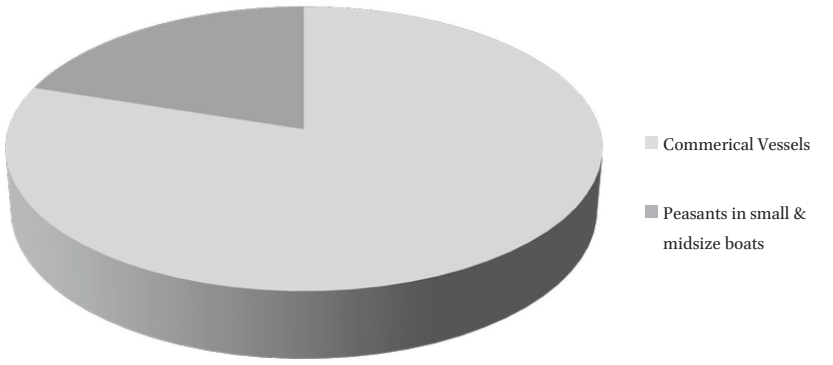


FIGURE 13 Panguil Bay fishers and fishing, 2019
SOURCE: PHILIPPINE ANNUAL FISHERIES PROFILES (AVERAGES FOR 2010 TO 2019)

than $1.00 daily, but the vast majority of these households are concentrated in Asia (World Bank 2012). Historically, Panguil Bay has been home to peasant fishers who rely on small non-motorized boats and simple net technologies that can be cast by a small group or attached to the cross bars on their canoes. Traditionally, capture fishing in the coastal waters and crustacean gathering in the mangroves have been the major sources of livelihood for peasant fisher households (interviews). Until 1980, peasant fishers produced a majority of the fish, shellfish and crustaceans consumed locally. As late as 1988, they captured more than 70 percent of the region's seafoods. By 2000, commercial fishers in large vessels were dominating production by capturing 45 percent of fish. By 2007, the share of regional fish production caught by peasant fishers had shrunk to about one- fifth. Over this period, the government prioritized the exploitation of Panguil Bay by commercial fishers. Development philosophy has advocated restriction of peasant access to Bay resources in order to make way for strategies that effect higher mass productivity and increased export value.[15] However, this public agenda does not reflect the realities of the lives of a majority of the peasant population who have few assets and even fewer few livelihood options.

In 1969, small capture fishers averaged twelve kilograms daily using traditional technologies. During the 1970s and early 1980s, a peasant fisher could make a good catch of finfish in less than two hours and net a few crabs. In 1992, peasant fishers captured 1.3 tons to every ton extracted by commercial vessels. By 2000, the marketable species in Panguil Bay had declined nearly 30 percent, but most peasant fishers could not compete with the larger commercial vessels that needed to go deeper into the ocean to catch them. At that time, more than half the fish captured from Panguil Bay had lower market value, and the average daily peasant catch dwindled to less than a kilogram by 2008. Fishers complain that fishing and crab gathering are almost dead because of the decline in marine species. Since 2000, a fisher feels lucky to catch a kilogram of finfish per day and only rarely catches one or two crab that are much smaller than those caught two decades ago.[16] On average, peasant fishers market daily only 36 to 91 US cents worth of fish, so most of them fall below the World Bank demarcation for absolute poverty. The species that is most significant among captured seafood exports is tuna which is predominantly harvested by commercial operators. Between 1992 and 2008, the Philippines tripled its tuna production, and Panguil Bay area commercial fishers generated one-third of that output. In 2007, tuna accounted for nearly 11 percent

15 Analysis of Philippine Annual Fisheries Profile (1988–2019).

16 Elder fishers claim they once captured crabs as large as unhusked coconuts.

of total municipal fish production and more than 34 percent of commercial production in Bay communities. The Panguil Bay area accounted for 17 percent of national production, and tuna accounted for 20 percent of the value of all regional fishery exports.[17]

2.2 *Depeasantization of Capture Fishing*

By 1995, national fishery goals had changed dramatically, spurring the use of larger exploitative technologies by the small number of commercial fishers. In 2007 along Panguil Bay, 136 commercial operators harvested two-thirds of the captured fish while more than 15,000 peasant fishers generated the rest. Small and mid-size boats in municipal waters averaged about four kilograms daily while commercial vessels averaged 333 kilograms (BFAR 2007). While peasant fishers average daily catches of about three-quarters kilogram, more affluent fishers employ exploitative technologies to acquire commercial-level catches. Financed by regional wholesalers or absentee investors, these fishers install large stationary nets in Panguil Bay or operate small commercial boats on shares (Interviews). By 2008, peasant fishing was marginalized from natural resources by capital-intensive commercial capture fishing and aquaculture. Since a majority of Panguil Bay fishers do not own much equipment, the largest catches are controlled by the minority who utilize exploitative equipment. Even simple technologies are not very widespread among fishers. The bamboo crab pot outnumbers any other mechanism, but only about one-third of fishers own them. Motorized boats can double the fisher's daily capture through the use of more complex gears, but only about one-fifth can afford them (or the diesel fuel). The crab lift net, the bottom set long line and the bottom set gill net are owned by 11 to 29 percent of fishers. Large stationary high-catch nets (i.e., bungsod, fish tower, and sangaab) are operated only by 1 to 4 percent of fishers who are financed by traders. The scoop net captures the largest daily catch, but it is owned by only 0.2 percent of fishers.[18] Such mass production strategies generate three-quarters of the regional production, and a high proportion of those seafoods is being exported. Higher-value species comprise 80 percent of the fish captured by commercial fishers while three-fifths of the catch of peasant fishers consists of lower-value smaller species that will be consumed locally (BFAR 2008).

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17 Analysis of Philippine Annual Fisheries Profile (1992–2010) and BFAR (2008). Scad (12 percent), sardines (10.7 percent), mackerel (4.6 percent), and anchovies (4.4 percent) were among the marketable fish, but these are not the most valuable seafoods for export.

18 Analysis of Philippine Annual Fisheries Profile (2006–2019) and MSU Naawan Foundation (2006: 90–93).

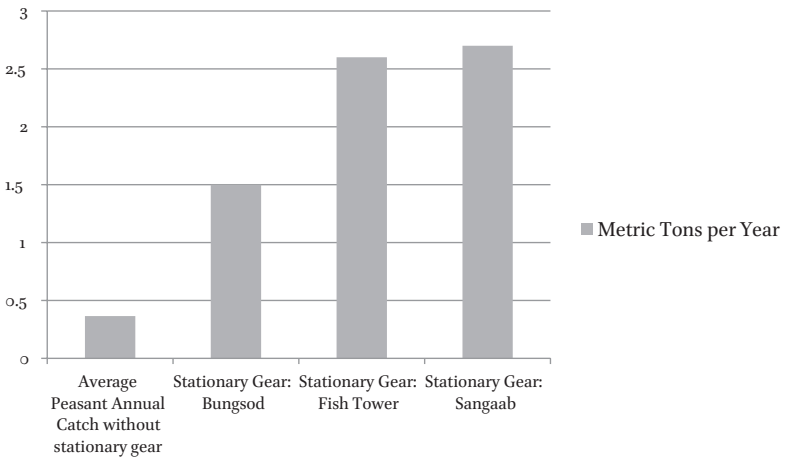


FIGURE 14 Average annual metric tons captured by peasants and illegal stationary gears along Panguil Bay, 2005–2015
SOURCE: PHILIPPINE ANNUAL FISHERIES PROFILE (AVERAGES OF 2005 TO 2015)

Because they are permanently installed over larger areas of the Bay, trader-financed stationary nets average daily catches that are two to eight times greater than those attained by peasant fishers with simpler equipment. Annually, a bungsod can capture twice as much as the typical production of one peasant who uses simpler technologies. Between 2005 and 2015, there were at least 648 bungsods permanently stationed in Panguil Bay, each averaging annual catches of 1.5 metric tons. Combined these nets hauled out nearly 1,400 metric tons, an amount of fish that would have required nearly 1,300 peasant fishers to capture (see Figure 14). Each year, a fish tower ensnares three times more seafood than a productive peasant boat owner. There were 141 giant fish towers permanently installed in Panguil Bay, each averaging an annual catch of more than 2.6 metric tons. There were also 543 massive sangaabs, each averaging an annual catch of nearly 2.7 metric tons. Nearly 2,000 peasants struggled to catch as much as these two types of technology withdrew from the Bay's resources.[19]

Local and national attempts to ban these stationary nets from Panguil Bay have been unsuccessful. For a five year period in the 1980s, Panguil Bay was closed to several intensive gears, including sangaab, bungsod, crab lift net, gill

19 For descriptions of these gears, see SEAFDEC (2005). Stationary gears function year-round, so a 365 day fishing season is assumed for them. A 260 day fishing season is assumed for non- stationary gears.

net, cast net, and troll line (Dickinson 1987: 226–27). The ban proved ineffective, as it excluded any fisher who used a boat weighing less than three tons. An FAO report described the banning as an assault on "external intruders," indicating that most exploitative gears were financed by external commercial operations (Baland and Platteau 1996: 14). In 1990, officials destroyed 1,600 net systems and uprooted several hundred net posts in the Bay. However, the gears appeared again almost immediately, and there has been no subsequent political will to eliminate them. As a result, there are nearly the same number of the most exploitative gears on Panguil Bay as there were in the 1980s. In 2005, there were nearly 1,400 stationary netting systems installed in Panguil Bay (MSU Naawan Foundation 2006). Combined, these exploitative gears withdrew 4,086 metric tons from the Bay, an amount that requires nearly 5,500 peasant fishers to capture with simpler technologies.

Illegal gears that were prohibited a decade ago are still operated all over Panguil Bay, both openly and covertly.[20] In our interviews and those conducted by MSU Naawan Foundation (2006), peasant fishers indicated that exploitative gears were a primary cause of fishery depletion and, therefore, a threat to their livelihoods. Because these stationary gears require high capital investment, peasant fishers point out that they are not enterprises of the poor. Interviewed fishers reported that construction of illegal sangaabs and fish towers are "usually financed and their operations controlled by capitalists who are fish traders, fish processors and exporters. ... The capitalists are considered so influential, financially and politically, that it would require a strong political will to dismantle the illegal structures that dominate Panguil Bay's seascape" (MSU Naawan Foundation 2006: 185–86). National policy labels them "passive fishing gears" that are "viable alternatives to fish hunting in the wild," ignoring that these technologies exploit far more resources than traditional methods. Couching these gears as "nondestructive," BFAR officials conduct training sessions and distribute this equipment to Panguil Bay fishers who can finance them (*Philippine Star*, 13 June 2010).

3 Transformation and Expansion of Aquaculture

Capture fishing dominated the Panguil Bay Region until the 1990s, supplemented by traditional aquaculture. In the early 1950s, there were 2,022 hectares of regional fishponds that specialized in polycultural production of milkfish

20 Sangaab, fish tower, dredge (motorized sudsud), and fine meshed gill nets are illegal (MSU Naawan Foundation 2006: 195). We saw and photographed many of these nets.

and shrimp that were fed with natural inputs through water exchanges. During the 1970s, major transformations occurred as a result of structural adjustment programs and new national development policies. Between 1951 and 1977, the total fishpond area along Panguil Bay expanded 437 percent. Since more than 6 percent of fishpond hectares were situated here, the national shift to export-oriented aquaculture fell disproportionately on this region. Because of its hydrological characteristics and confined waters, Panguil Bay was targeted by the government for further aquaculture expansion in the 1980s (Gauran 2003), and aquaculture hatcheries exhausted Bay resources by withdrawing high quantities of shrimp and fish broodstock (Tumanda 1982). As a result, 9.2 percent of the country's fishpond area was operating here in the 1980s.[21] Then fishpond hectares expanded another 50 percent after the 1988 Agrarian Reform Act permitted owners to shield their holdings from redistribution by converting them to aquaculture (Borras et. al 2005). Consequently, this region experienced one of the highest levels of land conversions in the country (Umehara and Bautista 2004).

3.1 *National Trade Crisis and Regional Expansion of the 1990s*

When the country caught "shrimp fever" in the 1980s, most Panguil Bay communities did not. A majority of regional fishponds continued to specialize in milkfish for local consumption until the early 1990s.[22] After the national crisis of the late 1980s and early 1990s in shrimp exporting, the country began targeting virgin territories of northern Mindanao for expansion of this commodity (Republic of Philippines 1992: 34). By 1995, nearly 13 percent of the country's fishponds were operating in this region. Despite its small coastal water area, Panguil Bay ranked 28th in the country in its aquaculture outputs during the 1990s.[23] As regional outputs of export shrimp rose sharply, milkfish production for domestic consumption dropped. Between 1998 and 2003, Panguil Bay was nationally targeted for increased fish farming of tilapia and milkfish and for intensification of seaweed farming. Some abandoned shrimp ponds were converted to milkfish production, and export seaweed production was intensified (JEP-ATRE 2004). Until the late 1990s, aquaculture production rose slowly and gradually along Panguil Bay, but the so-called rehabilitation efforts of the late 1990s stimulated even greater exploitation of regional resources (Roxas et al. 2009). By 1995, fishpond development had expanded to 28,250 fishpond hectares that consumed 14 times more land area than 1951 aquaculture. Regional

21 Analysis of Philippine Annual Fisheries Profile (1977–1990).

22 Analysis of Philippine Annual Fisheries Profile (1980–2000).

23 Philippine Annual Fisheries Profile (1995: 24).

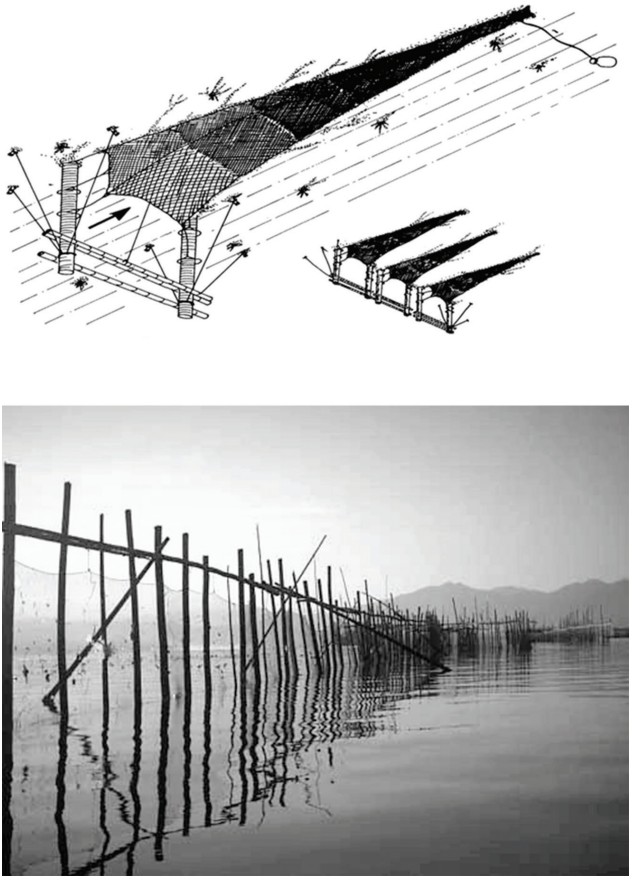


FIGURE 15 Exploitative fish harvest technologies. The top diagram shows a *sangaab*, the net system that produces the most massive catches from incoming tide waters; there were 543 of these installed in Panguil Bay in 2014. The bottom photo shows one of the 648 *bungsods*, most of which are managed by middle-sector peasant fishers who are in debt bondage to traders or financiers. These expensive technologies average annual harvests that are four to eight times greater than those attained by the most productive peasant fishers using traditional gears

fish and shellfish production in ponds began to rise sharply in the late 1990s, and aquaculture production has continued unabated since then.[24]

24 Analysis of Philippine Annual Fisheries Profile (1977–2012).

3.2 *Aggressive Aquaculture Promotion Since 2000*

In line with the development thinking of external funding agencies that vast areas of the Philippines "are still under-utilised with respect to aquaculture" (FAO 2004b: 3), the country's early 21st century fishery policy advocates "aggressive promotion in all regions" of export- oriented aquaculture (Mulekom et al. 2006: 552), especially in Mindanao. Because 43 percent of the country's aquaculture production occurs there (Menguita-Feranil 2007: 3), government funds were earmarked for "realizing Mindanao's agribusiness and aquaculture and mariculture potentials" (Republic of Philippines 2000: 59). Mindanao was expected to triple exports of aquaculture products to China quickly.[25] The Philippine Chamber of Commerce advocates that "aquaculture production in Mindanao offers opportunities for growth, with a variety of species available. Mindanao is an ideal location...due to its large production areas and year-round fish production" (PIA News, 17 September 2008). The President of Cruz Aquaculture repeated this position when he told the Sixth Mindanao Food Congress that "Mindanao can increase its aquaculture production and can compete with other Southeast Asian countries. ... We can have better production because we have big territorial waters" (*Manila Bulletin*, 20 August 2007). When the Philippines opened its seafood industry to intensified foreign investment in 2002, policy changes hit Mindanao hard. More than 40 percent of Japanese and Chinese trade agreement goals target this island (Escobar 2004: 39). To cement the role of the Philippines in the ASEAN Free Trade Zone, the Asian Development Bank provided funds to improve the country's export infrastructure, a sizeable segment aimed at Mindanao. Regional fishing ports were constructed to facilitate export, and six refrigeration facilities were developed (ADB 1999: 12).[26] To maximize export durability, twenty processing plants were opened, including eight canneries that can process 300 metric tons daily (*Mindanao Magazine*, 20 April 2009). The government also promoted fishpond transitions to new species, most of them genetically-modified. For example, the government funded twelve tilapia hatcheries in which it cultivated 60 million fingerlings of genetically-modified tilapia for distribution to commercial fishponds (*Asia Pulse*, 8 December 2004). Tilapia production was targeted to expand after "conversion of large tracts of land in northern Mindanao into fishponds in line with the project to promote export of tilapia filets to the US" (Aguiba 2004). After Vietnam earned $1 billion from catfish fillet exports to Europe and the US, Vitarich Corporation introduced this species to Mindanao by marketing fingerlings and specialized feeds (*Mindanao Magazine*, 26 May 2008).

25 USAID-Philippines website (accessed 15 April 2019).

26 Many of these public facilities are leased to private enterprises.

Since 2000, the government has targeted new production strategies in the ocean that it claims will overcome ecological problems of fishponds. The Philippines recruited foreign investments to establish most of its forty mariculture parks in Mindanao (*Philippine Star*, 23 July 2006). A typical park is 500 hectares or more, with farm plots for fish cages and seaweed farming. Adjacent to these parks are ancillary facilities, such as ice plants, cold storage, canneries, feed mills, and sea cage fabrication (*Agribusiness Week*, 29 April 2009). Much like a publicly-subsidized industrial park in the US, the mariculture park represents an attempt to rationalize aquaculture production into a vertically-integrated commodity chain. The stated goal is "to develop an area with appropriate equipment and infrastructure that will allow fishermen, fish farmers, and investors to operate cost effectively and securely" (Rosario 2006: 9). The government also "promoted partnerships with foreign investors to intensify commercial fish cage farming," like the Zamboanga City Mariculture Park (*Manila Bulletin*, 23 February 2008). To move fish to market as quickly as possible, the government developed a "mariculture highway" system that connects Mindanao parks to ports, in order to "enable the country to be an important player in the live food-fish export market."[27] Though government subsidized, these mariculture parks offer few opportunities for small-scale fishers because they encompass large-scale fishponds established by traders, urban financiers, foreign investors and powerful local officials (Palanca-Tan 2018: 309–310).

In addition to continuing pressures from international development agencies, the United States broadened its funding of "high-value aquaculture" in Mindanao, around three agro- industrial goals: (1) "significant expansion of production and marketing of several lucrative, non- traditional commodities;" (2) establishment of "cold and cool chains" to allow substantial expansion of fresh fish exporting; and (3) stimulation of "a major expansion of exports to the large and growing China market."[28] To "accelerate economic growth in Mindanao," USAID funded several infrastructure projects that process and store aquaculture and mariculture outputs, including boat landings, port upgrades, road construction, a multi-species hatchery, a mariculture park, a seaweed warehouse and seaweed solar dryers. A new grouper and abalone hatchery in southern Mindanao is operated by Mega Fishing Corporation, a deep sea purse seine operator that ships canned fish to 22 countries. The US Department of Agriculture "Buy USA" website makes clear why the US is funding aquaculture projects in Mindanao: the potential import of American technology, building materials and hardware. The US Embassy Mindanao Initiative and the US

27 Philippine Annual Fisheries Profile (2009: 23).

28 USAID-PH website (accessed 15 April 2019).

Commercial Service stimulated joint ventures between US and Philippine companies, and many of these partnerships offered American investors a four to six year tax holiday, a low income tax rate, and guaranteed 50 to 75-year leases. Buy USA declared that "Mindanao is the Philippines gateway to opportunity," and it recommended that American businesses export to Mindanao agribusiness and food processing machinery, solar power systems, refrigeration and cold storage equipment, plastic aquaculture building materials, chemical test kits, and flat-rolled iron. Buy USA claimed that "Mindanao has a strong affinity for US brands," so it recommended that US farmers export wheat, milk and soy products to the region. In fact, the Bureau of Fisheries and Aquatic Resources cooperated with USAID to try to expand the use of soy-based feeds in aquaculture. In short, the US presence in Mindanao was intended to develop new markets for US agricultural and industrial products.[29]

For the Panguil Bay area, the primary export goal is to "supply upscale foreign markets" with "high-value, high-demand aquaculture products, such as humpback grouper, tiger prawns, blue crab, sea cucumber, abalone" (*Philippine Daily Inquirer*, 1 January 2009). To accomplish that, two national goals were set for the Panguil Bay region. First, aquaculture was expanded through the introduction of new genetically-modified species (e.g., tilapia) that were in global demand and through construction and operation of hatcheries and input facilities. Second, the country recruited partnerships with foreign investors to intensify commercial fish cage farming.[30] Since 2000, the government has funded several support services to move the region toward a broader aquaculture agenda. Two mariculture parks of 695 hectares were constructed in Lanao del Norte and Misamis Occidental. A fish health lab has opened in Ozamiz City (*Media Monitoring Report*, November 2004), as well as a marine finfish hatchery in Misamis Occidental. Grow-out cages were established in Panguil Bay to produce fry for cultivation of grouper, milkfish, red snapper, crablets, and seabass (*Philippine Daily Inquirer*, 1 January 2009). To facilitate long distance shipments of seafoods, ice and cold storage facilities were constructed in the region. A processing plant at Ozamiz City prepared regional fish and shellfish for export to Manila and the world (BFAR 2008b).

These aggressive aquaculture development strategies have stimulated deeper exploitation of regional resources. By 2008, regional aquaculture production was 29 times greater than the 1984 level, but aquaculture outputs grew at less than half that level nationally. By 2005, there were 68 percent more Panguil Bay fishpond hectares than there were in 1988 when the bust stage

29 "Buy USA" website (accessed March and April, 2019).

30 BFAR Region 10 website, BFAR website (accessed 14 Sep. 2019).

FIGURE 16 This fishpond specializes in shrimp, and the Panguil Bay region generates nearly 17 percent of the country's production of this export commodity. However, fishponds like this one do not generate local employment. One laborer handles daily feedings and repairs, and he earns such a low wage that he must engage in part-time capture fishing while his wife must secure additional income from the informal sector

of shrimp farming hit the country so hard. Between 1995 and 2007, regional aquaculture production more than doubled, and this sector grew more than any commodity except processed chickens. While encompassing less than one percent of the country's coastal waters, this region generates a disproportionate share of the country's aquaculture production. In 2008, this small region produced nearly 17 percent of national shrimp output, more than one-third of the country's mudcrab, but less than 2 percent of national finfish production. While most areas of the country expanded freshwater facilities, nearly 8 percent of the country's highly-polluting brackish water fishponds were located along Panguil Bay. By 2019, more than 90 percent of the output of national fishponds was milkfish and tilapia (part of which is consumed domestically) while shrimp for export accounted for more than half the output of Panguil Bay fishponds.[31]

31 Analysis of Philippine Annual Fisheries Profile (1984–2019).

4 Integrating the Panguil Bay Fishery into National and Global Commodity Chains

The battle over ecological resources that has played out in Panguil Bay communities is not unique to this small area of the Philippines. Indeed, the transformations are a result of the integration of this area into the capitalist world-economy and its global food system. Multinational corporations integrate resource-rich zones, like Panguil Bay, in order to locate new supplies of raw materials, cheap labor and new markets for the commodities they move among the vast network of trading countries (Hopkins and Wallerstein 1987). In order to restructure an untapped region into a food extractive enclave, key capitalist actors take political and economic control over targeted ecosystems and their populations in order to reorganize them for export production. Public commons are eliminated through various forms of private enclosure that limit access rights of the peasants who predominate in this space. To cement this process, public policies are modified to encourage the agglomeration of large holdings of land and waterways. Essentially, access to ecological resources is redefined to transfer surpluses from local peasant producers into the hands of export-oriented capitalists. Once land tenure and access to ecological resources have been restructured, the regional environment can be articulated with the world-economy (Dunaway 1996: 276–85). In order for communities and their ecosystems to be transformed into extractive enclaves that export foods, existing domestic production sectors must be minimized or displaced to make way for the creation of new economic activities.

4.1 *Export Functions of the Panguil Bay Region*

Since the 1970s, the Panguil Bay region has undergone massive transformation of its relations of food production to become restructured around export activity. Panguil Bay's resources and fishers have been integrated at three levels. First, Panguil Bay is a *production regime* in which fishery production has been restructured in response to the country's international market agendas. Moreover, it is an *extractive food enclave* that transfers commodities to Manila to be processed for re-export to foreign markets. Second, this region is an *ecological extractive enclave* that provisions the rest of the country through exports of raw materials to support productive systems in other regions of the country (e.g., fish baits, livestock and aquaculture feeds, hatchery inputs). Third, Mindanao rural areas feed the rest of the country. Panguil Bay communities have been fundamentally changed as the island of Mindanao has been embedded into export chains that move food commodities to the National Capital Region. Consequently, the external trade linkages of Panguil Bay communities have

been restructured to move a majority of fishery commodities to Manila where the country's largest agribusinesses, food processors, and exporters are concentrated.[32] Manila acts as an entrepot to process raw materials into value-added commodities for re-export to foreign markets and for re- distribution inside the country. Because Mindanao produces more of the country's food supply than any other region (Republic of Philippines 1992), the government developed a logistics system to deliver the island's outputs more rapidly to Manila (*Minda News*, 17 June 2009). "We have a food security problem," the Secretary of Agriculture told the Third Aquaculture Congress in Mindanao. "So we need Mindanao to ship more of its products, and we need its food to help feed the 15 million people of Metro Manila" (*Minda News*, 30 November 2004).

4.2 *The Spatial Articulation of the Region's External Trade*

Like the rest of the country, Panguil Bay communities have been articulated with global markets through a multi-level distribution structure in which absentee foreign and national investors and a regional *comprador bourgeoisie* (Amin 1976) monopolize natural resources and control the flow of food commodities. Networks of regional petty capitalists, brokers, commission merchants and wholesalers are integrated into the commodity chains that transfer regional exports to national wholesalers and processors. Spatially, the villages, towns and cities of the Philippines are hierarchically structured into interlocking zones of production, distribution and consumption. To effect external trade nationally, layers of markets are connected between small villages, regional trading hubs and city bulking centers, commodity importing cities, and trade entrepots. In the Panguil Bay region, the largest cities (e.g., Ozamiz City, Tangub City) are hubs of commercial interaction with other regional communities and with distant territories. Consequently, the region's larger cities gradually became "foreign bodies" in their local economies, "looking beyond [their] narrow surroundings and out towards the greater movement of the outside world" (Braudel 1981, 2: 117). Export commodities are centralized in these towns where wholesalers, larger traders, merchants and manufacturers are located. Capitalist trading triggers a network of commodity chains in which larger trading hubs subsume nearby smaller communities. In this way, the fragile local economies of the region's small fishing villages are integrated into the spatial organization of the global food system and into world industrial markets for several nonfoods. Small villages move commodities to towns that have better access to transportation or are more commercialized. From these regional cities, trade

32 Analysis of national directory of agribusinesses and exporters, DA website (accessed 10 May 2019).

goods move to Manila and a few other national trading hubs that provide export linkages for the distant transport of bulky or perishable produce and import linkages for the wholesale distribution of foreign commodities. Local officials and NGO staff estimate that there is a 100 percent profit markup by the time commodities reach Manila. Government policymakers have observed that "raising agricultural and fishery production and competitiveness have not automatically and consistently led to increased farm income" because "an inordinate share of the benefits from higher production goes to middlemen" (Republic of Philippines 2000: 20). In the sections that follow, we will explore the actors and mechanisms through which fishery commodity chains have been constructed to integrate Panguil Bay communities more tightly into national and global markets.

Regional aquaculture production was transformed in the 1990s to move toward specialization in shrimp production for export. Indeed, when compared with production of all finfish through both capture and aquaculture, shrimp exports have been central to Panguil Bay fishery goals since 1993 (BFAR 1993). Between 1988 and 2007, the proportion of regional fishery production represented by shrimp rose steadily. On average since 2000, shrimp accounted for 40 percent of annual seafood output. By 2019, Panguil Bay communities were generating nearly 18 percent of the country's shrimp and more than one-third of its mudcrabs. Very little of these commodities is marketed locally, except for that small proportion that will not meet export standards. The national goal is to ship abroad as much as possible of these commodities in the fresh/near-fresh state in order to capture the highest prices from countries like Japan (BFAR 2007).[33]

4.3 *The Crustacean Commodity Chain*

Smaller producers of shrimp and crab enter these commodity chains through their ties to local consignment traders who sell on commission to small-scale wholesalers who buy in bulk (see Figure 17). In the Panguil Bay region, shrimp and crab are usually taken to buying stations in Taguitic, Tangub and Ozamiz Cities, and these wholesalers rely on local agents who maintain direct contact with fishers and fishpond operators. Four Kapatagan wholesalers buy and transport about a ton of shrimp and crabs to Manila every day, as do wholesalers at Bonifacio. Eleven wholesalers situated in Aurora and Tambulig also export about a ton every day. Wholesalers finance shrimp farms, *botilleros* who specialize in crab capturing or middle-class peasant fishers who employ large

33 Analysis of Philippine Annual Fisheries Profile (1988–2019).

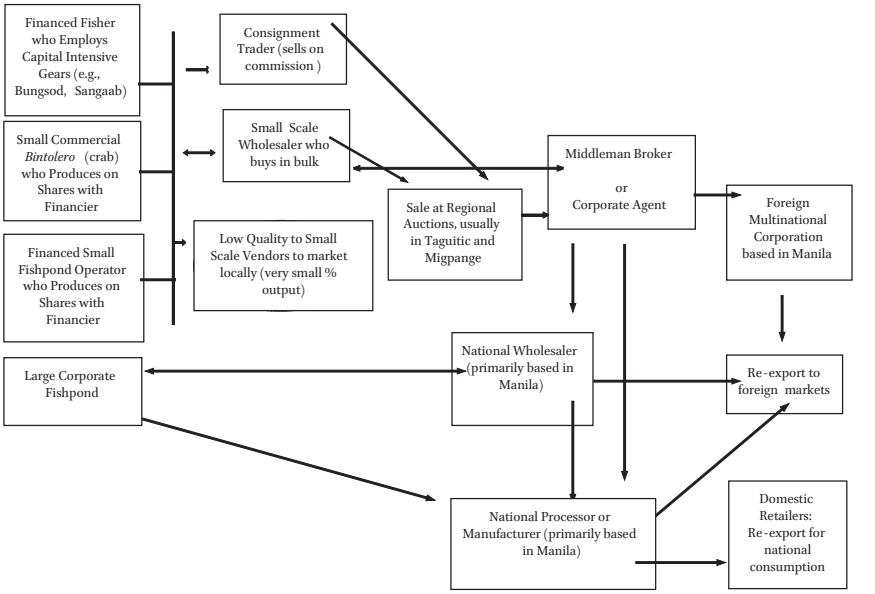


FIGURE 17 Commodity chain for Panguil Bay shrimp, prawns, and crabs
SOURCES AND NOTES: INTERVIEWS, PHILIPPINE ANNUAL FISHERIES PROFILE (2000–2019), BFAR WEBSITE. FINANCE AND CREDIT LINKAGES ARE INDICATED BY TWO-DIRECTIONAL ARROWS

stationary nets. In these contexts, the producers either are paid a share of their output (a sharecropping arrangement), or they repay indebtedness by marketing their produce to the wholesalers who finance them. These wholesalers pay in advance for stock to be harvested, typically specifying to the fisher or fishpond operator the quantity and quality of the commodity. These centralized marketing stations maintain ice facilities and processing plants where the commodities are sorted and prepared for export to Manila. If a regional wholesaler is financed by a national broker, the commodities will be shipped directly to this agent in or near Manila. Some producers sell directly to itinerant agents (*viajeros*) of Manila agribusinesses who travel around the Bay communities to make purchases.[34]

While large fishponds market directly to national wholesalers or processors with whom they have financial or corporate ties, shrimp marketing is more tedious and precarious for smaller producers. The small pond operator must book the sale of a harvest with a buyer who sets the delivery price based on an

34 Interviews with local officials and NGO staff.

average body weight that will meet export standards. If the shrimp output does not meet those standards, the buyer will either reject the crop or lower the sale price. In this way, the lowest quality shrimp output may be marketed locally through small vendors in wet markets. In some instances, the small pond operator sells lower quality outputs to a commission trader who disposes of it at low prices to a processor of sauces or mixes. From Panguil Bay communities, the consignment trader transports the commodities to a regional auction, usually at Taguitic or Migpange, where large loads are purchased by agents for national broker or corporations. At Manila, four types of national agents come into play: brokers, corporate representatives, wholesalers or processors. At this level, all the crabs and the highest quality shrimp are sorted and reserved for foreign export. That part of the fresh/frozen shrimp output that is headed abroad will leave the country within a day's time, but crabs may be air lifted within hours of the catch. Also in Manila, processors prepare shrimp for re-export and for redistribution within the country.

4.4 *The Finfish Commodity Chain*

As Figure 18 shows, regional marketing of finfish is far less vertically integrated because it involves more transaction points than is the case with shrimp and crabs. In contrast to the shrimp commodity chain, the finfish chain has greater

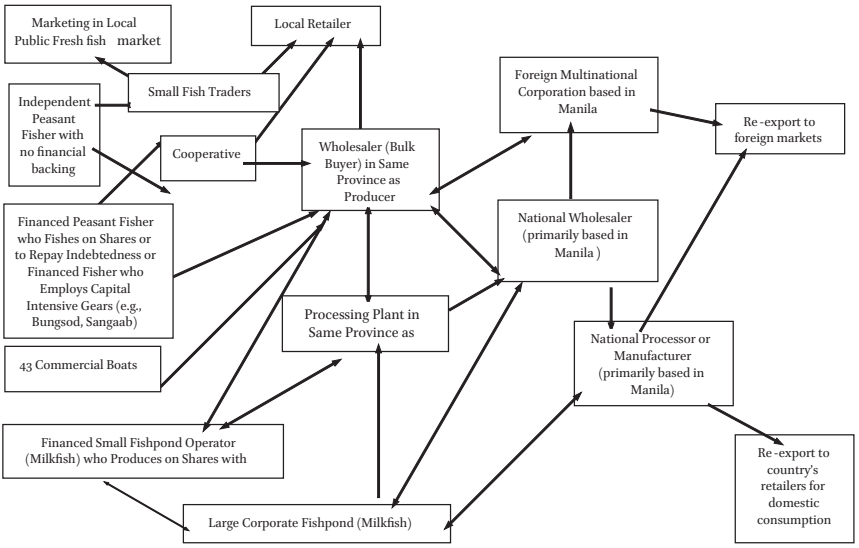


FIGURE 18 Commodity chain for finfish produced in Panguil Bay communities
SOURCES AND NOTES: INTERVIEWS, PHILIPPINE ANNUAL FISHERIES PROFILE (2000–2019), BFAR WEBSITE. POTENTIAL FINANCE AND CREDIT LINKAGES ARE INDICATED BY TWO-DIRECTIONAL ARROWS

numbers of small traders and larger mid-sector traders, and the path to Manila can be so circuitous that fish can be traded four or more times before reaching a national wholesaler, processor or exporter. Independent peasant fishers enter the commodity chain through small fish traders or cooperatives that market their catches in local public markets, to local retailers or to wholesalers that buy in bulk. However, a majority of peasants either fish on shares or market their catches to a small fish trader or a regional wholesaler who finances their operations.[35] Small fishers are trapped in an untenable position. "If they sell their produce, increasingly they lose part of the value by repaying debts to the commercial operators or town dealers who finance their trips and buy part of the catch. Some brokers finance hundreds of canoe fishermen at a time" (Krinks 2002: 134–135).

For instance, tuna exporters have thousands of fishers under contract. Typically, small tuna boat operators produce on shares with the wholesalers or processors who finance them. A wholesaler/broker extends credit advances or equipment financing to a boat owner against future catches. "By financing the cost of the fishing operations, the trader is assured of a steady supply of tuna. ... Traders generally dictate the going prices of tuna to the disadvantage of the producers, who feel the pricing scheme is cartelized since traders often [set] the same pricing cap" (Vera and Hipolito 2006: 44, 56). Wholesalers do not always accept the highest bid for traded tuna, as they prefer to market to a "preferred client" who can pay cash. Consequently, the producer may not be paid the most competitive price. Some boat-based wholesalers buy directly from small or mid-size boat crews, paying lower prices than the fishers could receive if they directly marketed their catches to land-based wholesalers. In sharp contrast, the 43 commercial tuna boats market directly to a wholesaler.

Wholesalers employ *contract farming* to control more production of tilapia and milkfish. In these cases, the wholesaler advances capital, equipment and aquaculture feeds, so the producer can generate fish at standards and prices set before production. Construction of capital intensive stationary fishing nets (e.g., sangaab, bungsod) are "usually financed, and their operations controlled, by...fish traders, fish processors, and exporters. This arrangement ensures a ready market for the harvested fish; the buying price, however, is dictated by the capitalists, to the disadvantage of the fishermen" (MSU Naawan Foundation 2006: 185). Large corporate fishponds often finance smaller

35 With respect to fish trading, we employ the non-sexist phrase "middle-sector traders" to reflect that there are a few women in this group. Some small fish traders join together to purchase and market fish, or smaller traders will market the fish of a larger trader. The colloquial term *amot- amot* is applied to specify such arrangements.

fishponds and market their outputs. Regionally, six exporters operate trading stations, and their local agents operate on commission for distant exporters who advance funds to be used to finance local fishers. Because a majority of small fishponds have been financed by traders, two-thirds of milkfish is marketed through wholesalers who buy in bulk. Payment is delayed to producers, as the fish is sold through silent auctions. Wholesalers load (or require producers to do so) finfish into 33 kilogram containers for auction. However, the trader (and the subsequent buyer) pays for 30 kilograms, externalizing to each producer an arbitrary charge for spoilage or product damage during transport to a distant market. In this way, risk from the trader's handling is shifted to the producers.

In addition to their structured linkages to Manila, these regional commodity chains exhibit four striking features. First, these are *noncompetitive* trading chains in which a few wholesalers/brokers dictate terms and conditions to many producers and to lower level traders. A majority of fishers and small fishpond operators are financed by, and must market their outputs through, wholesalers who have the capacity to manage long-distance transport, the technology to prevent spoilage, and the linkages required to market the commodities at the national and/or international levels. Indeed, there are numerous points in the commodity chains at which the lower level producer or trader is financed by the next higher level. Second, the commodity chains are polarized between those agents who market the most profitable seafoods that will leave the country in fresh/frozen form and those that handle finfish.[36] Because shrimp and crabs have the highest market values nationally and globally, the trade chains for these commodities are much more vertically integrated than the trade in finfish. The handling of the most expensive commodities is more rationalized among fewer layers of agents to insure expeditious transport to Manila or foreign markets. Third, the largest producers hold a market competitive position while small producers face three disadvantages. Financed fishers and fishpond operators must market their outputs noncompetitively to the investors to whom they are indebted, so they cannot competitively seek out higher prices. Thus peasant fishers or small fishpond operators are not able to reject or to bargain up the prices at which their commodities are sold. Since smaller operators

36 There are four other fishery commodity chains that we do not describe. Dried fish is marketed through a commodity chain that is separate from fresh seafoods. Two registered exporters/processors (A.C. Field Trading, E.R. Pon Trading) specialize in dried sea cucumbers. In peasant households, women dry, salt and/or smoke oysters and fish of lower commercial value. Sea cucumbers are re-exported as a delicacy to Japan while dried fish and smoked oysters are primarily distributed to local agents of distant city retailers. Seaweed is marketed through its own commodity chain of traders, wholesalers and agribusinesses.

are already controlled through credit terms, wholesalers do not view them as "preferred clients" to whom they need to extend special favors to sustain supply flow. Moreover, there are several points at which producers can be cheated or have their output quantities diminished in favor of the trader or wholesaler. For instance, producers are never paid for the full quantity of their outputs because wholesalers shift to producers the risk of spoilage losses by discounting the weight 9 percent or more (Interviews). Finally, only lower quality seafoods are targeted for local markets. Small fish vendors sell locally those fish catches that have such low commercial value that wholesalers will not purchase them. Smaller regional wholesalers and consignment traders sell to local retailers bulk supplies that have little commercial value, including substandard tilapia and milkfish. Purcell (2017) estimates that Asian small-scale fishers average 50 percent of the retail value for the lowest-value species (most finfish) and 10 percent for the highest-value species (shrimp, lobsters, crab, live reef fish).

4.5 *The Live Reef Fish Commodity Chain*

Live reef fish and exotic species are the most valued commodities in the Asian fishery trade (SEAFEDC 2017: 142). Throughout the Coral Triangle of the Philippines, Indonesia and Malaysia, more than 35,000 small-scale fishers exploit coral reefs, 27,000 of them situated in the Philippines. In 2009, the Philippines provided more than half the exports for the live reef fish trade which is valued at $2 billion annually. Since the 1990s, the primary driver for this trade has been the demand from Hong Kong and mainland China restaurants for exotic live finfish (especially grouper), mollusks (e.g., oysters, clams), shellfish (e.g., lobster, crabs) and cepahlopods (e.g., squid, octopi, sea cucumber). Even though product scarcity triggers higher prices, demand continues to rise because consumers prefer live species over pond and cage-produced commodities. A majority of the reef species are exported by air to Hong Kong, then re-exported to Shenzhen where the largest Chinese wholesalers are located. From there, the live reef commodities are distributed throughout mainland China by specialized trucks. Fewer than twenty major traders, middlemen and exporters collectively handle the reef fish trade in Hong Kong and China. Secondarily, fishers capture species for the ornamental species trade that is valued at nearly $1 billion yearly; these live species are marketed for American and European aquariums. Since 2010, a tertiary market has developed to sell juvenile fish and "trash fish" to operators who hold and grow smaller species in marine cages until they reach a larger, more profitable size (Elliott and Jang 2011; Maclean and Sadovy 2003; Padilla et al. 2003).

Most of the reef fishers are small-scale independent operators who have few viable livelihood options. Reef species often provide four to six times the

average price for non-reef species (Burke et al 2002: 30), so fishers are willing to take on debt for the $700 initial investment in boats and gear (Maclean and Sadovy 2003: 36). As a result, at least one of every 51 Philippine peasant fishers is enmeshed in the trade through a system of debt bondage that embeds them in a oligopolistic commodity chain that consists of a handful of regional middleman traders that operate collection stations for Manila-based exporters (Padilla et al. 2003). In this regard, Panguil Bay fishers have much in common with other rural Asians, for such arrangements are common throughout the Asian fisheries (see Table 14). Middlemen provide boats, gear and loans to fishers who repay the debt in installments by marketing their catches exclusively to these oligopolistic traders (Elliott and Jang 2011).[37] "The fishermen take their catch to the middleman and sell it at the prevailing price. When catch is low, or during lean periods, the middlemen provide for [fishing gear repairs and household necessities]. ... Payments are made in the subsequent fishing expeditions until the debt [including interest] is fully paid. As conditions become dire, the more indebted the fishermen become. The situation often leaves them in debt all year round and subsequently fully dependent on income from the live reef fishing trade to pay off debts" (Padilla et al. 2003: 6). The catch fisher receives about 30 percent of the price received by the middleman for the exported commodity (Maclean and Sadovy 2003: 34). Even though wholesale prices at Hong Kong range from $11 to $63 per kilogram, the typical Philippine reef fisher averages less than $50 monthly, before debt payments (Burke at al. 2002).

With 25,060 square kilometers of coral reefs, the Philippines is ranked among the world's coastal areas that have the highest levels of marine biodiversity (Spalding et al. 2001). The overfishing and destructive fishing methods associated with the live reef trade have seriously degraded Philippine coral reefs. By 2017, 90 percent of Philippine coral reefs were in fair to poor condition, compared to 93 percent of reefs around the coasts and bays of Mindanao (Licuanan 2017). In addition to severe overfishing of reef species, two illegal destructive fishing methods are utilized to maximize production quickly. Poisons are the predominant method used to capture high-value reef fish. Divers apply sodium cyanide to reefs to stun fish. The process destroys many fish and can leave residues that are harmful to humans. The initial poisoning bleaches part or all of the coral, and repeated incidents can kill vast areas of coral. Some fishers employ dynamite or cheap handmade grenades. A typical beer-bottle bomb can leave a crater of rubble one to two meters in diameter, and regularly bombed reefs frequently exhibit 50 to 80 percent coral mortality (Burke et al. 2002: 28).

37 For more live reef fish commodity chain details, see Padilla (2003: 6–7).

5 Is Philippine Fish Marketing Culturally Unique?

Panguil Bay residents apply colloquial terms to differentiate the economic power of the traders and marketing agents in the commodity chains that control the conditions under which they will be paid for their outputs.[38] However, these kinds of commodity chains and the agents who manipulate them are not culturally unique to the Philippines. Regional seafood marketing reflects what Joan Robinson (1993) terms *imperfect competition* because of its monopsonistic features. Ten companies export three-quarters of all Panguil Bay shrimp, crab and finfish.[39] With little competition, the monopsonist is able to dictate terms to suppliers, including prices, types of commodities and production standards. Because of control over limited services, such as transport of a perishable commodity to distant markets, these traders and brokers frequently pay different prices to producers who supply large volumes and those who are smaller producers. Consequently, the rate of exploitation of suppliers is high, for the value of the producer's contribution to output is far greater than the price received. In monopsonistic contexts, the price of the good is pushed down as near as possible to the actual cost of production (or below). The middle-sector traders who are able to lower production costs the most have the greatest *degree of monopoly* in the commodity chain and will be able to collect a higher proportion of its assets and wealth. Clelland (2013: 73–74) explains that degree of monopoly is

> the control of any mechanism that reduces the costs of production or increases sales prices in variance from a fully competitive market. ... As a commodity moves up the chain, each capitalist usually has a greater "degree of monopoly" than those below. And that degree of monopoly is reflected in the capitalist's ability to constrain the transmission of costs of production from below. Degree of monopoly is the ability to lower costs or raise prices beyond what would be possible in a purely competitive economy. Technically, this is a "degree of oligopsony" in which a few buyers control prices. The large wholesaler or retailer at the end of the chain may hold a true "degree of monopoly" through control of sales markets.

38 These terms include *consignacion* (consignment trader who sells on commission), *rigaton* (large wholesaler who buys in bulk for re-export), *comprador* (large wholesaler who buys fish).

39 BFAR Region 10 website (accessed 12 July 2019).

Once tied to a broker, a producer will receive lower prices than the value of the commodity in a marketing circuit that is competitive (Boal and Ransom 1997: 86).

For more than two decades, western scholars have observed that the power and profit in food commodity chains worldwide, "is to a significant degree a function of the most unique or least substitutable resources. In essence, the owner of the least substitutable resource has the most power to capture rents, transfer risks to others and have significant impact on what the chain does or does not do" (Boehlje et al. 1998: 400). In Philippine fish marketing, those agents are in the best position to dictate terms to producers who (a) have the resources to extend financing and/or (b) possess time and logistical advantages to move perishable commodities to distant markets. In the Panguil Bay region, those actors in the trading chain are at a significant advantage who can advance credit, who have the means to transport fresh seafoods, and who have access to ice, freezing or sanitary packaging mechanisms. Thus the weaker the financial and technological capabilities of the trader, the lower the profit that is extracted. Since they control "the least substitutable resources," the commodity chain favors national wholesalers, processors and exporters. Furthermore, the greatest degree of monopoly in the chain lies with those capitalists who have established network ties to foreign markets. Consequently, these Manila-based agribusinesses and exporters expropriate the largest share of the profit that accrues from the commodity chain inside the country.

5.1 *The Philippine Suki Tradition*

Scholars who studied the country's fishing communities in the 1970s and 1980s call attention to the *suki* linkages between fishers and fish traders, and a majority of Philippine analyses emphasize the exploitative aspects of this trade relationship. In the suki relationship, the fisher markets catches to the same buyer, who extends "favors," such as credit. In the past, scholars have reported that Philippine fishers are "tied to particular buyers, known locally as suki, from whom they obtain credit and sometimes inputs, such as fuel, and to whom they must sell their catch, often at a 10% discount on price received" (Smith and Mines 1982: 22–23). According to Jocano and Veloro (1976: 110–27), the indebtedness of the peasant fisher is advantageous to the suki because it helps to insure a steady supply of fish. However, the suki acts in a noncompetitive fashion to set the price of the commodity below its market value and demands immediate repayment of loans if the fisher takes a catch to another trader. Many suki charge outrageous interest rates over time, but the system persists because peasants have no better means to obtain credit. While low-level suki relationships may have characterized local fish trading through the early 1990s,

these small operators play a less crucial role in contemporary marketing. While small fish traders and municipal market-based suki still exist in great numbers, a majority of the Panguil Bay producers acquire financing for their fishing equipment from agents who operate at higher levels in the marketing system.[40]

There are several points in the commodity chains at which producers can become financially-bound to the buyers of their seafoods. Since 1995, credit and marketing have been interlocked at three levels. First, most poor peasants acquire credit from small fish traders who advance small amounts for household needs against future production. Second, at least 60 percent of the peasants fish on shares for traders or wholesalers who advance capital for boats, equipment, stationary net systems and household survival needs. Third, middle class producers acquire credit or financing from large exporters who are seeking to control fishery outputs into the future (Interviews). What has changed in the modern context is that small fish dealers and suki in municipal markets cannot finance the kinds of costly technologies that the most productive fishers and fishpond operators utilize. Being able to advance credit allows regional level wholesalers to capture a higher segment of the total production, and this is the degree of market monopoly that all traders seek to gain. On the one hand, national firms decentralize agents into regions like Panguil Bay, and these agents are able to extend higher credit levels than local suki. On the other hand, regional wholesalers often secure capital from national-level wholesalers or agribusinesses that advance funds to be used to insure monopsonistic advantages with producers.

5.2 *Parallels in Other Countries*

In sharp contrast to previous scholars who have analyzed Philippine fish trading as culturally distinct or "economically backward" (Szanton 1972), we would like to emphasize that this country's marketing strategies and mechanisms are quite similar to food and fish marketing worldwide. The monopsony, small producer exploitation and debt bondage that characterize Philippine fishery commodity chains have been observed in fishing communities all over the Global South and several richer countries. These types of exploitative trading linkages continue to exist in the global food system because they are so

40 Several Philippine scholars (e.g., Jocano 1983) have reported that the traditional suki relationship had nearly disappeared from many of the country's fishing villages by the early 1980s. For scholars who point out the exploitative aspects of suki in fish marketing, see Abad et al. (1986), Davis (1973), Hopkins and McCoy (1976), Jocano and Veloro (1976), Sevilleja and McCoy (1979), Smith and Mines (1982), Spoehr (1984), Panayotou (1985), Torikari (1990), Yotopoulos and Floro (1991).

profitable for the largest traders in the commodity chain. Rather than being "economically backward" structures that modern capitalists seek to obliterate, seafood marketing systems like those in the Philippines institutionalize mechanisms through which most of the risks are externalized to producers while minimizing their proportion of the total value of the chain. This country is not unique in its lack of competitive finance mechanisms for fishers, for credit has been employed in fisheries worldwide as a key method to control laborers and to acquire their outputs at below-market prices. "Smaller firms and individual producers are integrated into the operations of the big corporations as suppliers of raw materials and primary products. ... Only those firms with high investment exposure and easy access to unlimited credit through close connection with the centers of political power manage to appropriate the greater bulk of the economic benefits" (Tadem et al. 1984: 6).

As in other countries, the greatest power and profit in Philippine fishery commodity chains accrue to those marketing agents who have inequitable control over or access to limited services that are crucial to the production and distribution processes, particularly (1) political or economic assets that favor some actors in the chain over others; (2) credit and finance; (3) transport mechanisms in areas where there are limited options for producers: (4) food preservation mechanisms and capacity to process foods to meet distant standards; (5) the most timely knowledge about changes in demand or prices in distant markets: and (6) ties to distant wholesalers and retailers. These features are not peculiar to the Philippines, as there are parallel rural fish marketing strategies in many countries.[41] Indeed, this type of exploitative profit-taking by non-producers is "normal capitalism" at its best in the global food system. In addition to ecological surplus drains, transnational corporations transfer wealth to foreign countries through imported technology, technical and advising fees, interest on financing, and foreign manager salaries (Pelupessy and Vankempen 2005).

6 Ecological Impacts of Global Integration

Neither market prices nor production budgets take into account the value of natural resources nor the expense of repairing the degradation of the ecosystem

41 For studies of Asian countries, see Mai (1984), Klein et al. (2003), and Ferdoushi (2010). For studies of non-Asian countries, see Brown (1976) about Argentina, see Larson (1985) about Egypt. For analyses of credit and finance mechanisms in fisheries of other countries, see Bailey (1988a), Barrett and Apostle (1989), Jomo (1991), Ibarra et al. (2000), Nadel-Klein (2000), Hagan et al. (2003), Neiland and Bene (2004), D. Gordon (2005) and Salmi (2005).

that is caused by regional export activities. The entire island of Mindanao has paid high ecological costs for intense export-oriented development. The island has lost three-quarters of its mangroves, primarily to aquaculture growth, and it has been deforested at a rate that far exceeded the rest of the country (*Philippines Daily News*, 22 April 2003). In Mindanao, more than half the rivers are polluted, and only about 5 percent of the coral reefs are in good condition (*Minda News*, 17 June 2003). Mindanao waterways have been more ecologically damaged by mining and timbering than any other region of the Philippines (World Bank Philippines 2003). Similarly, the communities of Panguil Bay have paid high ecological costs for their integration into global markets. This region is one of the most damaged Mindanao fisheries, and it is in severe crisis due to nearly four decades of extreme exploitation. In recognition of the degraded state of fishing resources in the 1990s, the national government implemented a local recovery program (JEP-ATRE 2004). However, these conservation efforts failed miserably (MSU Naawan Foundation 2006). After a decade of so-called rehabilitation, the *Philippines Environmental Monitor* (World Bank Philippines 2003) declared Panguil Bay one of the most contaminated waterways in the country. Of the country's seventeen most critical ecological hotspots, the Department of Environment and Natural Resources identified three that are situated along Panguil Bay.[42] Despite the red flags raised by NGOs, fisherfolk associations, local government officials and external development agencies, the national government targeted Panguil Bay for more resource exploitation after 2000 (MSU Naawan Foundation 2006).

Panguil Bay is home to several diverse economic activities that are hazardous to the ecosystem. The water is polluted by chemical and organic residues from fishponds, industries, farms and beach resorts (World Bank Philippines 2003). As early as 1990, Philippine scholars were warning that chemical and industrial effluents were "capable of wiping out the fishing population" and of transforming Panguil Bay into "biologically dead waters" (Loquias 1991: 48–49). Alarmingly high levels of oil and greasy sludge kill turtles and fish, erode coral reefs, and choke mangrove trees. Massive fish kills have occurred after processing plants discharged chemicals, grease and oil into the Bay. Because the government does not provide public waste disposal systems, businesses and households dump into the Bay vast amounts of garbage, domestic wastes, and sewage (JEP-ATRE 2004). More than half of the farmlands surrounding Panguil Bay are suffering from moderate to severe erosion (Domingo 2001). Seasonal floods

42 These are Aurora area damage caused by illegal logging, degradation of Olanguin River in Lanao del Norte, and threats to survival of Lake Duningagat in Misamis Occidental (DENR website accessed 11 Feb 2019).

carry pesticides, lime, wastes (especially rice hulls), and soils from farms. Thus siltation has diminished the depth of the Bay and clogged its 32 connecting rivers (Gauran 2003). The quantity and quality of harvestable resources from the Bay's coastal waters have declined due to capture fishing, pollution and waste. Commercial operators throw away one-third of their catches that they consider to be "trash fish." This destroyed macroplankton contains "larvae of fish, crustaceans and cephalopods of commercial importance when allowed to grow to adult sizes. ... When the number of macroplankton organisms hauled daily will be extrapolated from the number of gears operating in the Bay, the result can be quite staggering" (Naawan School of Fisheries 1996: 12).

Peasants emphasized three sources of the worst damage caused by capture fishing to Panguil Bay: (1) government failure to eliminate illegal fishing by commercial trawlers; (2) government unwillingness to remove the most exploitative stationary fishing gears from the Bay; and (3) government policies that stimulate illegal fishing by foreign vessels.[43] In the words of one outraged fisher, sanggab (a stationary gill net) "devours the seas." In 2015, the Panguil Bay Development Council announced a project to remove sangaabs (Enerio 2015). However, later published scholarship reported that the Bay is overexploited due to the continued use of stationary fish corrals and sangaab gilllnets (Jumawan et al. 2021). In 2008, local fisher organizations requested national intervention to stop large Japanese, Korean and Taiwanese vessels from capturing tuna, marlin and other high-value fish in Bay waters. Rather than addressing such peasant complaints, the national government ratified an Economic Partnership Agreement in October 2008 to permit Japanese canning vessels to exploit the seas adjacent to Panguil Bay. Fishers contend that this new agreement will result in a growing number of foreign commercial boats in Bay waters (Lazaro 2008).

Even though the government fishery program (BFAR 2006) points to small fisher strategies as major sources of marine depletion, peasant fishing tactics generate only a fraction of the shortages and degradation that have been caused by commercial capture fishing and aquaculture. Between 1982 and 2021, twelve studies examined the increasing ecological degradation of Panguil Bay, pointing to the impacts of fishponds and the multiplicity of nonfishing activities along the Bay.[44] In its government-funded report on Panguil Bay rehabilitation,

43 We aggregated our household interview data with accounts of local officials and MSU Naawan Foundation (2006).

44 Tumanda 1982; Dickinson (1987); Naawan School of Fisheries (1991, 1996); Loquias (1991); Gauran (2003); JEP-ATRE (2004); MSU Naawan Foundation (2006); Roxas et al. (2009); Enerio (2015); Wilson et al. (2019); Jumawan et al. (2021).

MSU Naawan Foundation (2006: 234) reported that "the depletion of resources is attributed to the continuing conversion of mangrove areas into fishponds, the toxic effluents of fishpond operations, and over-exploitation of resources by commercial fishers." Despite earlier interventions to protect Bay habitats, mangroves declined 20 percent, seagrass cover shrank 20 percent, and hard coral cover dropped to 25 percent of their 1991levels (Roxas et al. 2009). Between 2015 and 2021, studies pointed to the continued decline of fish and crustacean species (Enerio 2015; Wilson et al. 2019; Jumawan et al. 2021). In recognition of the ecological problems associated with brackish water production, more than half of Philippine aquaculture outputs had been shifted to fresh water facilities by 2007. However, brackish water ponds still predominated along Panguil Bay after 2010 (Philippine Annual Fisheries Profile (2011–2019), and those fishpond effluents continued to cause decline of fish and crustacean species (Enerio 2015; Wilson et al. 2019; Jumawan et al. 2021).

Vandana Shiva (2000: 15) estimates that every acre of an industrial shrimp farm destroys or degrades 200 acres of productive ecosystem. Such damage is evident in this region. Due primarily to expansion of fishponds, Panguil Bay is surrounded by only 4.4 percent of the mangrove density that was present in 1950 (Roxas et al. 2009). Philippine fisherfolk associations point to the role of the World Bank and the Asian Development Bank in stimulating mangrove destruction. According to the fisher coalition Kilusang Mangingisda, "ADB and World Bank funds fueled the expansion of intensive aquaculture in Southeast Asia, which converted most mangrove areas for the large-scale production of shrimp and other species for export" (*Philippine Daily Inquirer*, 18 April 2008). The seemingly lush mangroves that border the Bay conceal the extent of the damage. "The area is actually hollow like a donut. The line of trees that one sees from the outside simply serves as a curtain to cover the continuing illegal and destructive exploitation" (MSU Naawan Foundation 2006: 216).

Despite negative fishpond impacts on the Bay, national and local government agencies have continued to promote fish farming. By 2005, the 18,000 hectares of Panguil Bay were dwarfed by 28,250 hectares of fishponds. Even though fishponds encompass an area that is 1.6 times the size of the Bay, these fish farms repeatedly dump their polluted waters into the Bay or its estuaries. As a result, fishpond sedimentation has shallowed the Bay, and pond chemicals threaten species survival. The diversity of seaweed and seagrass species has declined to fewer than one-fifth of 1991 varieties, coral reefs are endangered, and the diversity and numbers of fish stocks are "relatively poor" (MSU Naawan Foundation 2006: XXV–XVII). At the turn of the 21st century MSU Naawan Foundation (2006: 178) reported that the only species still in abundance in Panguil Bay were "those that do not fetch high prices." Indigenous

crab had been so overfished that they were present in the Bay at only about 10 percent of their level in the late 1990s. Two decades later, mud crab production by peasant fishers had declined sharply, and this species had been severely overexploited by 2020 (Jumawan et al. 2021). Post-2015 ecological research indicates that government efforts to rehabilitate area mangroves failed, leaving this important ecological resource in an alarming state as a result of cumulative conversions to fishponds, tourist beaches and agriculture (Wilson et al. 2019).

7 Food Insecurity in Panguil Bay Communities

When a region is integrated into the world economy as a food extractive enclave, production activities that support local consumption are marginalized to diminish competition for limited ecological resources. At the same time, some foods that are central to the traditional diet are commodified. With the entry of the first wholesaler into a Philippine fishing village in the 1980s, "fish became not just of value as *food* but was instantly convertible to money or even other goods (like rice) that could be taken from the comprador's store. ... In effect, fish *became money*; both the value of delivered fish and a fisher's debts would be recorded in the comprador's notebooks" (Hagan et al. 2003: 342). What follows is a process in which locally consumed foods are "fetishized" in public policy formation as commodities that have "high value" in distant parts of the globe. Government policies privilege these new export sectors over domestic food security, shifting public funds for research, credit, and production subsidies to foods that have "market value" and away from foods for domestic consumption. Panguil Bay fishers who were youngsters in the 1970s point to their loss of many of the seafoods that their families traditionally consumed.

Less than thirty years ago, community residents met returning fishers on the beaches at break of day. Before fish was sold to brokers or traders, priority was given to distributing daily food requirements to households. Since 1995, fishers are primarily met by commercial agents who export fish. Residents point to the disappearance from local fresh markets of top quality shrimp, crabs, squid, octopus, seaweed, sea cucumbers, fresh tuna, and numerous other seafoods that have been targeted for increased export. They also explained that they can no longer afford these foods, even if they were available. Many women report that they can only buy the shrimp heads that have no commercial value (Interviews). To complicate matters, fishing households cannot afford nutritious fruits and vegetables that have been targeted for export (Ness 2021: 110).

In the wake of this global process, Panguil Bay's peasant fishers have lost economic and political autonomy in their traditional food spaces, and their livelihoods have been displaced and marginalized by export- oriented capture fishing and aquaculture. Within three decades, the Panguil Bay region has been transformed into a *food extractive enclave* that sends away vast amounts of the survival needs that once were allocated to local populations.

7.1 *Declining Local Consumption*

The regional re-orientation of productive assets to prioritize exports has led to serious shortfalls in rice and seafoods, the traditional pillars of the Philippine diet. In 2007, local consumption needs exceeded the available rice supply by nearly 24,000 metric tons, representing a shortfall to nearly one-quarter of the population (see Table 13) Threats to local consumption of seafoods are even worse. Once we take into account exports and conversions to feeds, less than one-third of 2007 fishery and aquaculture production was left for local human consumption. In 2007, there was a deficit of 246,412 metric tons. Indeed, local consumption requirements were six times greater than the available supply of fish, shellfish and crustaceans. In this context, fishery commodities are too scarce and too expensive for a majority of Panguil Bay households, especially those that are highest in iron. "Only fish traders can afford to buy *pansat* [shrimp], *alimango* [crab] and *pugapo* [grouper]. Once very abundant in the wild and consumable items on the fishers' tables, these seafoods are collected, cultured or fattened and exported to outside markets (MSU Naawan Foundation 2006: 234, 265).

Why has local consumption declined? First, fewer of the available ecological resources are utilized to generate foods for local consumption, and three-quarters of farm hectares are growing nonfood or export crops (see Table 13). Thus there is only one hectare of rice to every 5.6 hectares of crops that are not eaten locally.[45] Prioritization of export aquaculture has further exacerbated the situation. While other Asian countries were less likely to convert croplands to fishponds between 1975 and 2000 (FAO 2004b), that threat to food security was quite obvious along Panguil Bay. By 2005, more than 82 percent of fishponds were situated on private lands that had once grown crops.[46] What is even more alarming is the ratio of fishponds to croplands. In 2010, the region had one fishpond hectare to every 4.6 hectares of croplands for domestic consumption.[47]

45 Analysis of land utilization, OpenSTAT.

46 Analysis of Primavera (1995), Shimura (2003), BFAR (2005) and MSU Naawan Foundation (2006).

47 Comparison of Philippine Annual Fisheries Profile (2009) with Table 12.

Moreover, there was one fishpond hectare to every 2.8 hectares of rice. In aquaculture, export-oriented production of shrimp and a few species of finfish have been prioritized over seafoods for local consumption, so regional production of milkfish declined steadily between 1984 and 2000. Production of milkfish began to rise again after 2002 when the national government began to target this variety for export.[48] Fetishized as a "high value" seafood that will attract future foreign exchange, traditionally consumed milkfish has risen in value so much that local prices were 1.5 times higher in 2009 than they were in 2000 (BFAR 2000–2009).[49]

7.2 *Conversion of Nutrients to Nonfoods*

Many seafoods that were once consumed as part of the human diet have been redirected into nonfood uses. According to the fisher coalition *Kilusang Mangingisda*, export-oriented aquaculture has led to massive loss of wild foods in mangrove areas and to dwindling fishery stocks (*Philippine Daily Inquirer*, 18 April 2008). Because aquaculture facilities require three kilograms of fish protein to every kilogram produced (BFAR 2006), Panguil Bay mollusks and shellfish have been depleted to a crisis point. Fishpond operators gradually worked their way downward through four increasingly smaller shellfish species, competing with the human food chain to redirect natural resources to feed shrimp. *Amahong* and *burnay,* two species of mussels that have been a traditional part of local diets, are nearly extinct due to uncontrolled, unregulated and continuous harvesting to collect feeds for shrimp production.[50] Once these two species were in limited supply, *punaw* was the next marine resource depleted to feed the shrimp farms. *Punaw* are so limited that this traditional food shellfish is expensive in local markets. After *punaw* were diminished, fishpond farmers substituted *agihis* which are also threatened. Once plentiful in the shallow coastal waters, these small fish are now concentrated in deeper waters and are difficult to harvest. In addition, nearly 13 percent of the local seafood supply is processed into fishmeal and fish oil to be used as additives in aquaculture and livestock feeds. Nationally, 55 feed mills integrate fish and shellfish into feeds (Bestari and Morales 2005: 15–16), so there is increasing

48 Analysis of food balance sheets, FAOSTAT.

49 A majority of Muslim Filipinos live in Mindanao, and these communities exhibit the highest poverty and malnutrition rates of the country. Despite the food insecurity of their communities, the Medium-Term Development Plan (Republic of Philippines 2000: 34–36) authorizes government funding for the development of a special economic zone that will target traditional Muslim foods for export.

50 Interviews with a public technician at one of the BFAR Stations along Panguil Bay and with local fishers who harvest wild small fish to sell to local fishponds.

demand for smaller, cheaper fishes from Panguil Bay for this purpose. Poor peasant fishers are alarmed about what next will disappear from their ecosystem, as they have observed declines in crabs, shrimp, larger fish species, clams, and small food fish and shellfish over the last three decades (Interviews). According to Primavera (2000: 102), "Philippine fisheries are so degraded, fish supplies are so inadequate, and people are so poor that they need fish of all sizes and prices." In 2008, however, exports and nonfoods accounted for nearly 88 percent of Panguil Bay aquaculture production. Milkfish, the species most consumed by Filipinos, is increasingly targeted for nonfood use. While there is an inadequate supply of milkfish to meet local needs, the national government is encouraging use of milkfish as bait to catch tuna.[51]

The transformation of seaweed from part of the traditional Filipino diet to a "high-value" export commodity is instructive. In 1998, the Philippines ranked third among seaweed producing nations, rising to second in 1999. By 2001, seaweed cultivation accounted for two-thirds of the country's total aquaculture output in tons (Albor 2002). The Philippines specializes in three types of seaweed exporting. The country is the largest carrageenan chips manufacturer globally and the world's third largest producer of refined carrageenan, annually shipping to Spain, Denmark, France, India, and the United States 115,000 metric tons of semiprocessed seaweed worth $69 million, most of those exports deriving from Mindanao. In addition, 22,500 metric tons are exported annually as seaweed extracts valued at $105 million (BFAR 2009). Peasants indicate that several varieties of seaweed were gathered from the wild for the local diet in the 1970s and 1980s when there was no commercial production along Panguil Bay. Between 1988 and 2000, the region averaged less than 60 metric tons annually, and most of this was consumed locally. Due to national demand for more seaweed output to support national manufacturing of carrageenan for export, Panguil Bay production rose sharply after 2000.[52] By 2008, regional seaweed farms were producing nearly 36,000 metric tons, an output level that was 968 times greater than the 2000 production. In 1988, tuna and shrimp accounted for 80 percent of the market value of regional seafood exports while the market value of seaweed was minuscule. By 2005, the value of regional seaweed exports exceeded tuna, shrimp and crabs– even though this nonfood sells at a far lower prices than the seafoods. Less than one-third of Philippine seaweed output is used as food, but most of that is exported in dried form to Japanese

51 "Milkfish Commodity Roadmap," BFAR website (accessed 8 January 2019).

52 "Seaweed Commodity Roadmap," BFAR website. BFAR Region 10 website (accessed 8 January 2019).

and Chinese markets.[53] Moreover, gathering from the wild has been rendered dangerous by the periodic upsurges of "red tide" toxins that have been stimulated by aquaculture expansion all over Asia.[54]

8 Looking to the Future

Just over a decade ago, peasant fishers in the other Asian fisheries altered their dependence on local traders. By 2010, most Asian peasant fishers sold two-thirds of their output directly to large wholesalers in towns and cities, often as a direct reflection of their debt bondage to those agribusinesses (Siar and Kusakabe 2020: 23). In the Philippines, small scale fishers continue to market their catches locally to traders to whom they are indebted, a monopsonistic process that involves several layers of middlemen who collect more of the profits than the fishers. Middleman profiteering, debt bondage, and illegal labor trafficking are central economic elements of the 21st century Asian fisheries (see Chapter 8 for more detail).

A brief assessment of government market philosophy regarding shrimp and seaweed provides insight into the outdated economic notions of "high-value commodities" that still dominate national and international thinking. While shrimp and seaweed are fetishized by Philippine government agencies as the most profitable export crops, there is much market mythology and misjudgment represented in this rhetoric. The interests of a few exporters may be reflected in these agendas, but the realities of the world market are not. First, the Philippines prioritizes seaweed export, even though it is one of the lowest-priced fishery commodities in world markets. Once globally dominant in export of seaweed, the Philippines is now dwarfed by China. Still the country has increased its imports of this commodity since 2000 in order to be able to manufacture more carrageenan for export.[55] Second, the market position of shrimp has been volatile throughout the decades that the national government has advocated and subsidized its production. The number of producers of shrimp worldwide has multiplied tremendously since 1980, primarily because international development agencies encouraged so many poor countries to enter this export arena. Since the 1980s when China became the world's largest shrimp producer, the Philippine position in world markets has declined sharply, and it is doubtful that the country will ever regain a competitive

53 Analysis of Philippine Annual Fisheries Profile (1988–2009).

54 BFAR website (accessed 7 Aug 2019).

55 "Seaweed Commodity Roadmap," BFAR website (accessed 8 January 2019).

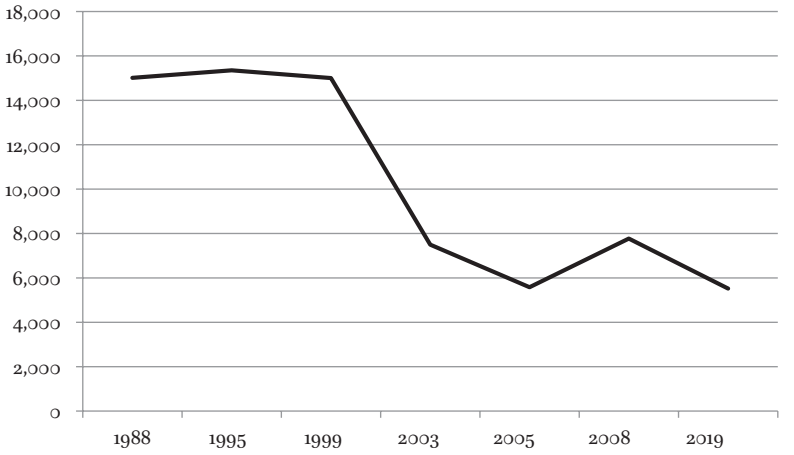


FIGURE 19 Price paid per metric ton of shrimp/prawns exported from the Philippines, 1988–2019
SOURCE AND NOTES: PHILIPPINE ANNUAL FISHERIES PROFILE (1988–2019). VALUES WERE CONVERTED INTO 2010 $US FOR STANDARDIZED COMPARABILITY OVER TIME

position in the global food system. When market prices are standardized for comparability over time, we see that the country is losing economic ground. In 2006, the country received only one-third as much for a ton of this commodity as it did in 1988 (see Figure 19). One Philippine economist recommended in 2009 that the country import foods in order to prioritize the production of "high value exports," like shrimp, that offer a "comparative advantage" in world trade (*Philippine Business Mirror*, 8 June 2009). Even in 2009 when this position was taken, Philippine shrimp were no longer competitive globally. By 2019, a metric ton of Philippine shrimp was worth only 37 percent of its 1988 international value. While the country risks food insecurity and ecological degradation to produce shrimp, this export commodity no longer holds either the "high value" or the global "comparative advantage" that this economist touted a decade ago. In its emphasis on "large-scale production and commercialization," the country's five-year fishery plan for 2022 to 2027 calls for a continuation of this failing "development framework."[56]

56 BFAR News, 22 Feb. 2022, https://www.bfar.da.gov.ph/BFARnews?id=457 (accessed 28 Feb. 2022).

CHAPTER 5

The World Does Not Weep for Us

Semiproletarianized Households, Nonwaged Labor and Depeasantization

Abstract

We analyze the human and community impacts that have followed the transformation of a food self-sufficient region into a *food extractive enclave*. We examine how seafood exporters keep global consumer prices fictitiously cheap through two interconnected processes. On the one hand, seafood commodity chains structure mechanisms through which exporters derive hidden labor subsidies from peasant households. On the other hand, exporters keep prices low and profits higher by externalizing costs of production to fisher households through livelihood threats, depeasantization, low remuneration, debt bondage, degraded ecosystems and threats to human survival. As a result of hidden household subsidies and externalization of costs, the United Nations Human Development Indexes for our target fishery are among the worst in the world. Even though their communities are exporting vast amounts of farm produce and seafoods, these peasants are 1.3 times more likely to fall below the food threshold than other rural households. Moreover, fishery restructuring has led to the alteration and intensification of women's work in ways that threaten household survival and food security.

> Our government blames us for the environmental problems, tells us we are in the way of progress, and wants us to go into alternative livelihoods that will leave us even poorer. Fishponds and commercial trawlers are killing our way of life. The world has not mourned the deaths of so many of our small creatures and plants that were used to feed fishponds or destroyed in commercial nets. And the world will not weep if we small fishers starve.
>
> (Panguil Bay Fisherwoman)

In the previous chapter, we examined the restructuring of Philippine fishing communities into food extractive enclaves, and we pinpointed the networks

of the global commodity chains that export valuable resources from them. In this chapter, we will explore the impacts of those transformations upon local households. In our analysis, we will investigate the ways in which the everyday lives of peasant fishers are embedded within export commodity chains. For that reason, we will envision a commodity chain as more than a long string of corporate spatial points at which a marketable product is extracted, processed and distributed. We will shift our conceptual lens away from such analyses (e.g., Gereffi and Korzeniewicz 1994) in order to explore the commodity chain as an interconnected network of nodes at which laborers, households and natural resources are exploited, threatened and underpaid (Dunaway 2013).

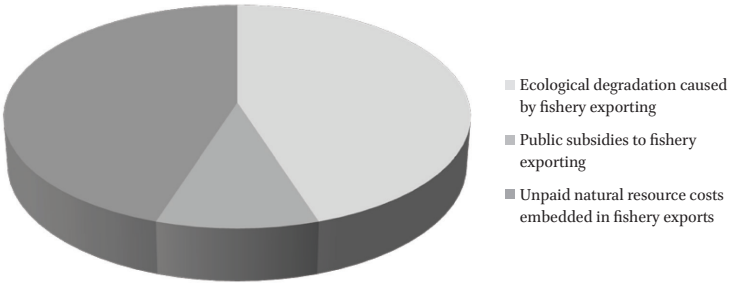
The capitalist world-system has structured a controlling mechanism through which exporters extract visible and hidden surpluses from workers. That mechanism is the *semiproletarianized* household which depends more on income and resources from nonwaged labor than from waged employment in formal sectors (Wallerstein 1995: 5–6). Consequently, a commodity chain reaches deep into the everyday lives of households because capitalists exploit several forms of their nonwaged and unpaid work. In addition to surplus extraction, capitalists maximize profits by externalizing production costs to worker households. Externalized costs "are part and parcel of normal capitalism, and they are to be found at every node/link of every commodity chain" (Wallerstein 1995: 8). Thus capitalists shift to communities, to ecosystems, and to laborers most of the real costs of commodity production. In this chapter, we will investigate two questions:

1. What are the mechanisms through which peasant fisher households provide hidden subsidies to export commodity chains?
2. What are the mechanisms through which export commodity chains externalize costs to peasant fisher households and communities?

1 Hidden Household Subsidies to Export Commodity Chains

A commodity chain structures five mechanisms through which capitalists extract unpaid or low-paid surpluses from households. The first level of hidden inputs into commodity chains occurs through women's biological ability to reproduce and to sustain new laborers. To capture the hidden value of unpaid household labor, capitalism triggered the division of the economy into visible and invisible sectors (Mies 1986: 100–110). Only that which has value in the marketplace was assigned to the formal economy while the work necessary to sustain households was redefined to be *nonproductive*. Labor that earned money in the capitalist workplace or marketplace came to be defined as

Part A. Unpaid ecological externalities embedded in Asian fishery exports



Part B. Unpaid household externalities embedded in Asian fishery exports

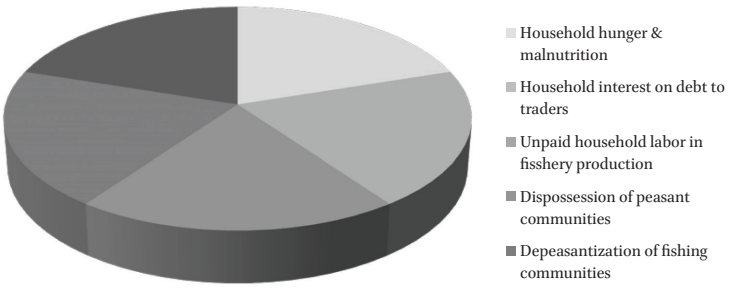


FIGURE 20 Unpaid dark value embedded in exported Asian fishery commodities
SOURCES AND NOTES: CLELLAND (2013, 2014, 2015B, COMMUNICATION WITH THE AUTHOR). THESE CHARTS ARE NOT STATISTICALLY CORRECT, BUT ARE FOR CONCEPTUAL PURPOSES ONLY

productive. Concomitantly, labor inside the household was devalued with the myth that it generated no surplus that could be appropriated (Wallerstein 1983: 24). Even though it is not priced in the marketplace, housework has economic value, and its unwaged character makes it highly profitable. The housewife's unpaid work is a direct input into capitalist production because it is embedded in the market commodity as an element of worker household reproduction "made available to capital for free" (Boydston 1986: 21–22).

For this reason, non-proletarianized labor is essential to capitalism, and the highest profits result when nonwaged labor subsidizes commodity production (Wallerstein 1976: 279). For instance, the tiny percentage of Panguil Bay fishers who are waged laborers for fishpond operators are "located in household structures in which the work on this new 'export-oriented activity' forms only a small part of the lifetime revenues. ... In this case, other household activities which bring in revenues in multiple forms can 'subsidize' the remuneration for the 'export-oriented activity,' thereby keeping the labor costs very low" (Hopkins and Wallerstein 1987: 777). At every point in a commodity chain, households subsidize low remuneration of capitalists, in order to sustain the laborers who produce the commodity. Those waged laborers who make contributions to export sectors do not earn a living wage that is sufficient for the reproduction of the household unit. The hidden inputs of households are preconditions for the productivity of household members who engage in waged labor for commercial fishers or fish farms. Her husband's fishpond wages were "never enough," one fisherwife explained. "I have to work in order for the family to survive. I bear the hardship because we could not depend solely on a monthly salary which is actually less than what we need to purchase household essentials." Consequently, *nonwaged* labors generate the bulk of fisher household resources and subsidize the accumulation of profits within the export commodity chains.

The second level of hidden subsidies occurs through unpaid household labor that is contributed to home-based commodity production. The semiproletarian household is a locus of production in which members simultaneously produce their consumption needs and market commodities. Because of their combined subsidization of capitalism through unpaid reproductive and market-oriented labors, households have been the "pillar of accumulation" throughout the history of the world-system (Smith et al. 1984). Virtually every wife and most children are expected to contribute labor as assistants to the market-oriented production of the husband (e.g., capture fishing, seaweed farming), but that family labor is neither valued economically nor acknowledged socially (Boydston 1986: 9). Indeed, women and girls are more likely than males to be unpaid workers in family-based enterprises or farms (United Nations 2003). Wives and children in peasant fisher households provide several labor inputs into husbands' market production. Perhaps the most significant unpaid household labor occurs when wives market fish for husbands or manage credit with traders. When husbands are waged laborers or operate a fishpond on shares, wives and children help with maintenance. Though such tasks are publicly credited to males, wives and children repair and maintain fishing equipment, manage seaweed parcels, and collect fish from stationary nets. Even though public documents claim that women never fish in boats, many women reported to us that they regularly assist husbands with fishing.

FIGURE 21 Seaweed accounts for the greatest volume of mariculture outputs along Panguil Bay. Plastic bottles are used to float the lines for seaweed farms, so some areas of the Bay are filled with thousands of them. Behind the seaweed farm is an exploitative stationary net

The third level of hidden subsidies occurs when households receive low remuneration for their nonwaged inputs into an export commodity chain. There are three types of these hidden inputs. There can be direct and indirect flows into the production process from household provision pools, from the informal economy, and from illegal sectors. Nonwaged household workers supply foodstuffs, raw materials and other inputs that provision the capitalist production process. Second, peasants receive below-market prices for household-based inputs into commodity chains, including the manufacture of crafts and the collection of ecological resources (Mies 1986). For example, peasant fishers gather wild inputs for which fishponds pay below market value. A harvester usually toils an entire day to capture a sack of small shellfish that are sold to fishpond operators at less than $1.[1] Once plentiful in shallow coastal

1 Throughout this chapter, all monetary values are $US.

waters, these diminishing shellfish can only be found in deeper waters, so harvesters must go longer distances. Households produce crafts that are absorbed into production processes, especially baskets, hemp ropes and nets. In addition, the informal sector provides cheaper goods to support the household needs of capitalists and workers. In the Philippines,

> the informal sector is not a separate category, divorced from the formal sector; rather it is linked to the formal sector in a dependent and exploitative way. ... These workers provide the formal sector with low-cost goods and services which enables it to reproduce its own labour-power at reduced costs. Thus the informal sector captures the surplus labour of women: it is labour that is unaccounted for...[even though] it keeps the costs of labour down and allows labourers to be productive. (Eviota 1992: 133)

In this way, nonwaged laborers subsidize consumption of underpaid waged workers. By supplying to waged workers lower-cost foods and survival needs than they could acquire through formal markets, these nonwaged informal sector laborers also make it possible for capitalists to pay lower wages.

The fourth level of hidden household subsidies occurs when workers are ensnared in *home-based putting out systems* that are structured by commodity chains. Throughout the history of capitalism, householders have been exploited through such labor control mechanisms. In putting-out systems, direct producers receive credit advances from a trader or financier who obtains their outputs at noncompetitive fixed rates. By employing putting out mechanisms, capitalists can capture cheap nonwaged labor and inexpensive material inputs from households (Portes 1983: 171). Moreover, workers and their households are controlled through their chronic indebtedness to financiers (Littlefield and Reynolds 1990). Through these exploitative mechanisms, capitalists externalize many of the costs of production to households by paying a low level of remuneration. Households assume the costs for provisioning workers, for the integration of unpaid children, for equipment, for electricity and support goods and services, and for any public accountability associated with ecological damage. For three decades, Asian industries have integrated nonwaged workers directly into their commodity chains through home-based contract work and contract farming (Pearson and Razavi 2004, Dunaway 2013). As we explain in more detail in a later section, Panguil Bay fishing has been transformed into a putting-out system in which export firms and traders advance credit to finance fishponds, fishing boats, gears and nets, as well as household survival needs. Most peasant fishers are deeply indebted and are always working to repay past debts. In this way, fishers have become low-paid contract workers for lenders

who specify the commodities to be produced and who purchase their outputs at below-market prices.

The fifth level of hidden subsidies occurs when households at lower nodes of a commodity chain provide concealed benefits to traders, retailers or consumers at higher nodes. In effect, the commodity chain structures a network in which consumers at higher nodes gain advantages from the exploitation of households at lower nodes. Through Philippine fish and shellfish commodity chains, capitalists exploit nonwaged producers in order to export cheap food to distant buyers. In this context, the low wages, malnutrition, and degraded ecosystems of peasant fishing households keep global prices of seafoods low, permitting the distant consumer to avoid the real costs of production and to pay fictitiously cheap prices. While the Philippine fisherwife and her children go lacking in essential protein and nutrients, the Japanese working-class housewife feeds her offspring an abundance of hidden household scarcities for which she does not pay.

2 Conceptualizing Capitalist Externalization of Costs to Households

Capitalists extract other hidden subsidies by externalizing costs of production to worker households. Capitalism generates chronic scarcity of resources that are needed to supply the basic survival needs of laborers. On the one hand, Asian capitalist enterprises target a minority of workers while "preventing the majority from entering the occupational niches that export-oriented economic policies foster." Moreover, capitalist commodity chains replace household crafts with imports and capture a high proportion of local consumer goods for export (Rocha 2001: 92, 88). On the other hand, capitalists appropriate "so many of the fruits of the workers' labor that the workers cannot maintain themselves or reproduce their labor power" (Frank 1981: 87).

Because export-oriented growth has drawn local resources into the world economy, Panguil Bay's agriculture and fishery have been increasingly *commodified* (Wallerstein 1983). Globalization of local foods has led to the loss of public commons and the encroachment of capitalist enterprises into the productive and reproductive spaces of Panguil Bay's peasant farmers and fishers. However, the market prices of regional food exports do not accurately reflect their real costs of production. Through cost externalization, capitalists exploit as many conditions as possible that lie outside their operating budgets, in order to make commodity production and distribution as "financially costless" as possible to the profit-taker. Consumer prices in distant markets "do not reflect the true costs of producing fishery products as long as externalities are

not made to 'show up' in the value chain. With social and environmental costs missing from the equation, what is actually expensive and wasteful becomes apparently cheap" (Jacinto 2004: 17). In the sections that follow, we will examine six categories of production costs that are externalized to peasant fishers: (a) threats to fisher communities; (b) depeasantization; (c) debt bondage; (d) threats to livelihood, (e) alteration and intensification of women's work, and (e) threats to human survival.

3 Externalization of Costs to Peasant Fishing Communities

Damage to communities is the first category of production costs that exporters routinely externalize to Panguil Bay households. The hidden production costs of food extractive enclaves are absorbed by the exporting local communities. Economic losses and public safety threats result from the shift to export agendas. Even though they redirect and damage so many local resources, many fishpond operators pay no taxes to local governments. In many communities, rivers have been diverted or degraded for fishpond development. Such loss of river access is economically disastrous for most of the affected villages. For instance, the village of Lapinig was once linked to Panguil Bay by four inbound rivers that supported an active port at which passenger and fishpond barges regularly docked. At that point, the community was a thriving economic hub, with the natural advantage of waters deep enough to accommodate heavy boat traffic. By the mid 1980s, Lapinig River had become shallow due to sedimentation caused by fishponds and timbering, and boat navigation was precarious. By the early 1990s, water had receded so much that its port was dead, destroying the community's economic base.[2] An elderly fisher observed: "A few get rich off nature's bounty while small fisher villages bear nature's retaliation."

Flooding is one of the worst externalized costs impacting many communities, and these not-so-natural disasters are exacerbated by policies designed to benefit exporters. First, fishponds have eliminated the buffer zones of mangroves that shielded communities during typhoons and storm surges (Primavera 1997). Second, flood control strategies were designed to divert flood waters away from corporate fishponds in many communities. Third, fishponds and farmland erosion have caused deep siltation of the connecting rivers, making them too shallow to carry the rushing waters to Panguil Bay. As a result, the excess pours into fishing communities. Floods threaten every

2 Interviews of community officials.

aspect of community life and economic activity. They devastate businesses, houses, roads, bridges, gardens, livestock and livelihoods. Public sanitation is threatened, the water supply is contaminated, and toilets are destroyed. The incidence of drownings is high, and great numbers of dangerous snakes are brought by flood waters. Consequently, communities that experience repeated flooding have higher poverty and lower quality of life than the communities that are not flooded (MSU Naawan Foundation 2006).

Another form of damage to communities is evidenced by continued failures of public conservation programs. In 1990, Panguil Bay was selected as

FIGURE 22 Peasant fisher housing. These are typical dwellings of impoverished fishers. The small houses at the top ring a fishpond, and they are frequently reached by flood waters through an adjacent irrigation canal. The bottom photo shows a fishing village on coastal waters where there is "no toilet but the sea."

one of twelve fisheries that were earmarked for conservation efforts under the national Fisheries Sector Program. In 2000, government interventions were again directed toward the Bay through the Fisheries Resource Management Project. In both instances, the prohibition against mangrove deforestation was ignored, and deforestation continued. There were no signs that public conservation has had any positive effects on the condition of the Panguil Bay ecosystem. Fishery resources were increasingly depleted, as the number of species and the abundance of fish steadily declined. Fishpond operators continued to dump their toxic effluents into the Bay and rivers, and illegal exploitative gears multiplied. There was no progress toward slowing sedimentation and shallowing of the Bay, and there was no decrease in the chemical effluents and wastes from fishponds, industries and farms. Coral reefs were highly endangered, and legally-protected sanctuary areas were further degraded (MSU Naawan Foundation 2006).

In its assessment of why public regulation failed during the early 21st century rehabilitation project, MSU Naawan Foundation (2006: 240–68) pointed to the powerlessness of regional, provincial and municipal governments to enforce conservation procedures. Local disempowerment resulted because the relevant national agencies offered little or no political support or funding and provide "conflicting interpretations of the law governing fishpond development." Violators with national political ties stymied local regulators. In local court and policing systems, "big-time violators, those who converted mangrove areas into fishponds or who drained poison waters from their ponds to the estuaries, appear[ed] to be untouchables." At the local and provincial levels, MSU Naawan Foundation (2006: 267–68) considered violators "unstoppable" because they utilized political patronage ties to evade legal constraints and court actions.

In the early 1990s, the Asian Development Bank implemented a mangrove stewardship program throughout Asia, a massive project designed to rehabilitate mangroves that had been devastated by fishponds. In 1991, "Mangrove Stewardship Agreements" were awarded to fishing cooperatives and NGOs around the country, including a Panguil Bay cooperative project to rehabilitate an abandoned fishpond.[3] In its project assessment a decade later, the ADB (2001) was highly critical of how the Philippine stewardship program was operated. The Bank reported that there was no reversal of the degradation of the mangroves and that the program failed to generate the promised income and

3 PDENR Administrative Order No. 15–90 and AO No. 30, https://www.informea.org/en/legislation/denradministrativeorderno9015establishingregulationsgoverningutilization (accessed 3 Oct. 2021).

food resources for impoverished households. Many of the stewardship parcels were illegally redirected from rehabilitation to fishponds while the program directed too much of its regulatory attention to "minor illegal fishing activities" by peasant fishers. There were more than 600 media reports of stewardship violations all over the country (*Philippine Daily Inquirer*, 16 February 2005). Still, no local or national government units took action to end stewardship infractions (ADB 2001). The *Manila Times* (12 April 2005) contended that the conservation program had been used as "a form of leverage" by some "unscrupulous PDENR officials and employees" who coerced local mangrove stewards "by threatening to take away their lands if they declined to comply."

4 Pressures to Depeasantize Panguil Bay

Depeasantization is the second category of production costs that exporters have externalized to Panguil Bay fishers. Since the mid-1990s, there has been renewed scholarly and policy concern over questions about the disappearance of peasants, especially in Asia and Africa. Depeasantization is defined to be the erosion of an agrarian way of life that combines household and commodity production with family labor and village settlement (Bryceson et al. 2000). The expansion of neoliberal export strategies has exacerbated food insecurity throughout most Asian countries. Shortfalls and distribution inequalities result from the integration of local ecological resources and economic activities into export strategies (Bernstein 2000). Globalization of public commons, like fisheries, has eliminated control of peasant communities over the resources they have traditionally employed to generate local sustenance. Those constraints on ecological access have been effected in order to transform local survival resources into profitable commodities that can be exported at cheap prices to consumers in distant world markets (Shiva 2000).

In order to generate foreign exchange to repay external debts, Asian governments succumbed to structural adjustment plans that reorient productive forces to export, thereby setting in motion development policies that privatize public commons, open local economic activities to foreign investors, displace small farmers and fishers for the establishment of producers of larger scale, and worsen food security problems (Shiva 2000). As their livelihoods are threatened by the integration of their traditional commons into the world economy, peasant households have been forced to seek out their survival needs through "a fumbling attempt to 'make do' in a severely deficient market environment" (Bryceson 1999: 194). As their communities and their ecosystems have been incorporated into global commodity chains, peasants have broadened their

household labors to include petty commodity production, seasonal migration, occasional wage labor, share production, subcontracting, and numerous informal sector activities (Akram-Lodhi and Kay 2009). Depeasantization is intensified as households are more deeply absorbed into export commodity chains, forcing them into new finance and contractual arrangements that widen and deepen their debt bondage (Brass 1999).

As the Panguil Bay fishery has been reorganized around export goals, polarization between peasant and export fishers has widened. Small producers have been marginalized by public policies that concentrate land and waterways under the control of the largest export producers. Because their survival needs lower the level of surplus extraction for export commodity chains, peasant fishers are demonized as a threat to the national agenda to integrate Panguil Bay communities into global markets. Consequently, government policy has been to *depeasantize* Philippine fisheries through three strategies: (a) land and water grabbing by foreign investors and large domestic exporters; (b) increased subsidization and promotion of export-oriented technologies, accompanied by constraints on small capture fishers and (c) greater reliance on imported genetically-modified species that are in global demand, alongside economic devaluation of natural species captured by small fishers. In the sections that follow, we will explore two structural mechanisms that lead to fisher depeasantization: (1) public policy formation and (2) constraints on access to ecological resources.

4.1 *Public Policy Formation*

Only 3.4 percent of the national budget was allocated to agriculture in 2003, with only 0.4 percent going to fisheries and aquatic resources. Research into development of cotton (a rare crop in the Philippines) benefitted from nearly as much funding as did coordination of all the country's fishery programs. Research into use of fibers received four times more funding than fishery programs while fertilizer and pesticide industries were allocated more than twice as much (Republic of Philippines 2004). In line with its overall framework of export-led growth, the national government promoted "export financing facilities, duty-free or low tariff access to inputs by export producers, tax holidays and other fiscal incentives for export production and trading, elimination of export tax...and restructuring of the investment incentives system to encourage export ventures" (MSU Naawan Foundation 2006: 9–10). To complicate matters, local governments spend the majority of their agriculture funding to research, demonstrate and subsidize a few export crops (Republic of Philippines 2003).

In order to justify marginalization of peasant fishers from public funding, government policy makers (a) blame them for most of the ecological

degradation of fisheries and (b) depict them as an outmoded way of life that cannot provision its communities. Government fishery officials whom we interviewed routinely depicted peasant fishers as poverty stricken communities that exploited natural resources to a greater extent than any other economic activity. One public official told us that ecological threats to the Bay will continue "for as long as the poor fishers remain dependent on its resources." Such rhetoric is grounded in the myth that fisher population is too large for the ecosystem and that their population growth has caused the ecological degradation (e.g., PDENR 2006). For example, one publicly-funded report claims that:

> The growing population is putting more and more pressures on the Bay's bio-physical environment. It must be recognized that the degradation of the environment and the depletion of natural resources are inextricably linked to poverty. ... While the natural resource base is fixed, the population is rapidly increasing. Since the economy of the municipalities around Panguil Bay cannot provide alternative livelihood resources for everyone, an increasing population readily translates to increased rates of resource extraction. ... As their incomes fall, the people are forced to increase the rate of exploitation of the natural resources, thereby accelerating degradation. (MSU Naawan Foundation 2006: 290–91)

Even though this report acknowledges the ecological problems caused by industries, aquaculture, and highly-financed illegal fishing operations, it ideologically blames that 9 percent of households that fish with traditional methods and have the lowest capacity to damage the Bay.

The underlying economic assumption embedded in such reasoning is that peasant fishers need to be less productive so that large exporters can increase and sustain high outputs. On the one hand, such "blaming the victim" rhetoric is faulty Malthusian anti-poor reasoning. Population growth accounts for much less of the increased fishing effort than the technological sophistication and the environmental destruction of the largest producers. If all peasant fishers disappeared instantly from the Bay, the large producers would simply expand the rate and scope of their extraction and waste of ecological resources. On the other hand, claims about population growth do not stand up against official statistics. In reality, most of the population growth in this region has resulted from the influx of displaced agricultural workers from other regions. While most fisher families have lived in this region their entire lives, about one-third have migrated into the area over the last decade, externalizing to Panguil Bay fishers the human costs of unemployment in other parts of the

country. These migrants lack equipment, fish part-time and tend to relocate within a few years. In addition, there is a growing trend toward outward migration of younger workers who do not return.[4] More importantly, the population of the Bay region has not grown to the same degree as the rest of the country. Between 1990 and 2000 when so much of the ecological devastation occurred, Panguil Bay population declined more than 2 percent while the national population increased more than 2 percent. Between 2000 and 2015, Bay population expanded less than the rest of the country.[5] There is another indicator that the "growing population" argument is questionable. Between 1991 and 2005, boat ownership declined more than 21 percent along Panguil Bay (MSU Naawan Foundation 2006: 347).

Decisions affecting access to waterways and natural resources are made by national bureaucracies whose definition of *stakeholders* in fisheries gives more weight to government-contracted NGOs and to the minority of middle class and large producers than to the thousands of small peasant fishers. Consequently, there is a tendency in government-funded reports to blame the declining state of Philippine coastal areas on peasant fishers while understating or silencing the more destructive impacts of commercial fishing, aquaculture, farm runoffs and industrial waste. For instance, Subade and Abdullah (1992: 47–48) call for the elimination of small Philippine fishers as the solution to fishery degradation. "Additional fishing efforts have to be strictly curtailed" by shifting peasant fishers into other occupations, they contend, and policing of peasant fishers "needs to be improved to ensure proper utilization of the already overexploited fish stock." In this unrealistic thinking, there is no call for any changes to the ecological damage caused by commercial capture fishing and aquaculture.

Why has this kind of public rhetoric about small fishers predominated in Philippine fishery policy? While commercial fishing firms, aquaculture, cash crop farming and agribusinesses fit into the neoliberal agenda to export Panguil Bay resources, peasant livelihoods do not. "Modernization implies the gradual replacement of the traditional productive structure by another much higher capital intensiveness. ... On the one hand, the process of modernization incorporates into the new structures the individuals and groups that are apt to fit into the kinds of rationality that prevails there. On the other hand, it expels the individuals and groups that have no place in the new productive structure" (Kumar 1980: 76). In effect, public fishery policies seek to *depeasantize* Panguil Bay (1) by privileging foreign and domestic large commercial operations, (2) by

4 Interviews of several community officials.

5 Analysis of RSSIS: Module 4.

excluding peasant fishers from government subsidized programs, and (3) by widening access of foreign investors and of large foreign commercial vessels to fishery lands and waterways.

The Philippine government privileges large export producers, including foreign investors, through its policies that structure access to resources and public subsidies. The Bureau of Fishery and Aquatic Resources terms its management regime "open-access," but these resources are far less open to traditional fishers than to new export activities. One Philippine scholar complained to a WTO public forum that "the open access regime combined with the push for aquaculture farming has caused serious depletion of marine coastal resources, affecting livelihoods of small-scale fishers" (Transnational Institute 2008: 7). To complicate matters, the country's resource management program fails to target the enterprises that generate the worst ecological damage (Bernardino 2005: 10–12). The Philippine government has set the goal of diminishing the municipal sector of fishers, claiming that the transition of fishers to alternative livelihoods will relieve pressure on over-taxed fisheries. In contrast to its goal of a decline in peasant fishers, the country's Medium-Term Development Plan targeted a growth rate of 12.6 percent for aquaculture and a 1.7 percent expansion for commercial fishing (Republic of Philippines 2000). In the export-oriented regime, peasant fishers no longer control factors of production or distribution of their outputs. Decisions affecting access to waterways and natural resources are made by class-biased government bureaucracies that reflect elite interests (Krinks 2002), and the definition of stakeholders in fisheries gives more weight to a few large producers than to the thousands of small fishers (Primavera 2000). In addition, standards, risks and prices for their outputs are determined in the international arena and by the traders to whom they are indebted.

The government has privileged large export producers through two strategies. First, national policy has been to recruit foreign investors in fishery lands and waterways. In 2009, the Department of Agriculture announced that nearly 2 million hectares were targeted for recruitment of investments from foreign agribusiness corporations, nearly one-third of the lands situated in Mindanao fishery areas (Cruz 2011:8).[6] The government seeks to build joint-ventures in aquaculture with foreign investors, as in the case of a $28.6 Saudi Arabian

6 A 1993 Philippine law (RA07652) allows the government to undertake long-term leases of land. In April, 2012, the Philippine Congress began to debate a new law to regulate large-scale foreign land investments. However, we have been unable to find any indication that House Bill 6004 was enacted. See 2021bwww.congress.gov.ph/press/details.php?pressid=6074 (accessed 3 Oct. 2021).

investment (IBON Foundation 2011). Such foreign land and waterway deals have resulted in the forced displacement of indigenous and peasant fishers (OXFAM 2011b; *Philippine Daily Inquirer*, 12 September 2010). Philippine agreements with Japan, South Korea and Taiwan have led to "ocean grabbing" of the country's coastal waters by long-distance industrial-scale trawlers and floating canneries. One fisher organization termed Philippine coasts an "open city for foreign plunderers." One cannery vessel is supported by fishing fleets that can harvest 6,250 tons of tuna annually, but there are numerous foreign vessels legally operating in Philippine waters (Navales 2012). In addition, foreign-controlled large agribusinesses, tourism, mining and industries have rapidly polluted rivers and coastal waters, with no accountability to local communities (*Philippine Daily Inquirer*, 12 September 2010).

The government privileges large export producers through a second strategy. Public fishery loans have been overwhelmingly "channeled to big fishermen, commercial operators and fishpond operators rather than to small fishermen" (Tadem et al. 1984). In fact, the average government loan is too large for peasant income (Dickson 2003), and most fishery subsidies are allocated to export sectors. In 2006, for example, a majority of government fishery subsidies were allotted to shrimp and pearl culture (Philippine Annual Fisheries Profile 2007). After natural disasters, bailouts of commercial aquaculture and large fishing operations are common. Following a 2009 typhoon, the Secretary of Agriculture announced a financial bailout for large fishpen operators. The Philippine Federation of Fisherfolk, criticized this decision because it ignored the thousands of affected peasant fishers. The organization pointed out that such bailouts protect "the welfare of big fishpen operators" while treating small fishers like they "don't deserve attention" (*Pamalakaya Times*, 17 May 2009).

Touted as "an answer to the needs of marginalized fisherfolk," forty mariculture parks were developed nationwide, most of them in Mindanao. Each park consists of 500 or more water hectares subdivided into individual parcels that are leased annually. To expand export fish outputs, the parks rely on fish cages because they are more economical. While it costs only 15 percent as much to construct and repair, a cage can produce as much as a one hectare fishpond. Adjacent to cage parcels, the government subsidizes (and recruits foreign investors for) processing and canning plants, ice facilities, cold storage, feed mills, sea cage fabrication, and aqua tourism. Since 2006, government rhetoric publicly justifies the expansion of mariculture parks and fish cage culture as mechanisms to provide non-fishing income for coastal communities. The official rhetoric is that "through mariculture parks, the fishermen are weaned from fish hunting to fish farming" (Philippine Annual Fisheries Profile 2008: 11). However, the cost of these technologies circumvents peasant

fisher participation. One fish cage requires an investment of more than $9,400. In addition, these parks generate few employment opportunities for peasants. Only 7.5 percent of the total income from a park is used to employ caretakers, cage fabricators, security and maintenance personnel. Moreover, more than one-quarter of the cages are leased by foreign investors (*Agriculture Business Week*, 29 April 2009).

Local and regional government fishery policies prioritize support to commercial fishing and aquaculture. Regional municipalities acquire about 15 percent of their annual budgets from concession right fees for access to natural resources.[7] In return for annual fees, concessionaires exercise monopsonistic rights over an area of the Bay or one of its connecting rivers. The best financed bidder typically obtains exclusive rights to waterway areas where stationary nets, fry gathering, or fishponds will be developed (Polo 1987). Thus access to natural fishery resources is an economic and political asset that is both scarce and inequitably distributed. Through policies that define "entitlement" to different classes of fishers (Neiland and Bene 2004: 79), Panguil Bay resources have been depeasantized. This fishery is not an "open access resource" that can be equitably utilized by all. In fact, the most productive parts of the fishery have been privatized and assigned to the largest producers, and constraints on access to the rest have been concretized in public policy. As Kremer (1994: 78) observes, "the poorest in fishing communities are usually those who have only access to a marginal part of the fishing grounds or those who are even totally excluded from the fisheries." One peasant fisher queried, "How will the poorest fisherfolk who don't have motors be able to fish if more fishponds are built and we have to go even further out to fish?" (Broad and Cavanaugh 1993: 79).

Large producers are also privileged through public policies that broaden access of large commercial vessels to municipal waters. In 2003, the national government rescinded a 1998 act that reserved 15 kilometers of municipal coastal waters for the exclusive use of small fishers. In their public outcry against "government's continued callousness and indifference," Panguil Bay fisher organizations raised alarm that "commercial fishing ruins our coastal fishing grounds. Their heavy destructive gears have heartlessly raked the corals, damaged the marine ecosystem, the fertile breeding grounds of fish. Over the years, our income continues to shrink, our families, especially the children, suffer malnutrition" (*Philippine Daily Inquirer*, 18 July 2003). National and local governments also prioritize large producers through their research

7 Interviews of several community officials.

and subsidy programs. Convinced in 2010 that "biotechnology is the key to the country's survival," the national government subsidized and distributed 194 million genetically-modified (GM) fingerlings and broodstock to expand export outputs. The Secretary of Agriculture announced that national policies "will give priority to agriculture and fisheries biotechnology to not only spur increased productivity and incomes but also to develop a global niche market" (PDA News, 10 January 2010).[8] Most of these GM species benefit large fishpond and cage operators and are beyond the financial reach of both peasant fishers and small pond operators. Moreover, several GM species have been introduced in the past, and they have neither been consistently productive or profitable. According to one small pond operator, "the government has promoted several new miracle varieties that have not been so miraculous. Like different species of shrimp, all of which failed after a few years. Or just wouldn't grow in some parts of the country. And now, they are announcing new miracle species that will save our aquaculture. But after all these 'miracle' species, fishponds are just as risky as ever. And some of these new species push us further into debt" (Interviews).

In addition to prioritizing Philippine export producers, national legislation opened fisheries to foreign boats and investments. Indeed, the government recruits foreign investors who receive advantages not available to Filipinos, including subsidized financing, cheaper freight rates, tax abatements, tariff relief, and support from government research programs (Philippine Annual Fisheries Profile 2008). The 1975 Fisheries Modernization Act made foreign exploitation easy by opening municipal waters to three ton trawlers (Republic of Philippines 1975). In the 1980s, illegal foreign fishing in municipal waters netted more than 600,000 metric tons annually to Japanese, Taiwanese and South Korean vessels (Tadem et al. 1984: 25). For more than two decades, Bay communities have complained about the impact of foreign trawlers. In terms of degree of resource devastation, "trawling is on par with strip-mining and the clear cutting of trees." In fact, a trawler scours a half-acre "in a single pass and hauls upwards of two tons of dead and dying marine life to the surface" (*Nature's Voice*, June/July 2011: 2). Philippine fisher organizations have opposed the country's bilateral trade agreement with Japan (JPEPA) because it opens the country's coastal waters to Japanese trawlers and factory ships, leading to loss of livelihoods of more than 180,000 tuna fishers. These organizations are alarmed that the agreement targets overfished Mindanao waters for increased Japanese access, and they fear trawlers will illegally exploit municipal waters, even more aggressively than they have in the past (*New Humanitarian* 2009).

8 At the same time, the Department of Agriculture announced seed subsidies for GM rice and the introduction of 38,000 GM livestock.

Several incidents of illegal Japanese fishing were reported after JPEPA ratification in 2008 (*GMA News*, 6 January 2009; *Philippine Star*, 25 January 2011).

4.2 *Constraints on Peasant Access to Ecological Resources*

According to Nickerson (1999: 279), "mangrove forested areas in the Philippines have been steadily transformed from a common property resource, of multiple use and benefit to a large number of people, to a private good...narrowly channeled to the benefit of a select few." Transformation of Panguil Bay into an extractive food enclave required reallocation of control over traditional commons areas into the hands of a few government leaseholders or private land owners. In line with the development doctrine of external funding agencies that "large growers are more efficient than small growers" (FAO 2004b: 3), the government implemented an export-led strategy that privileged investment in large ponds controlled by corporations and large investors. With World Bank backing, the Philippine Fisheries Credit Program prioritized expansion of monocultural ponds that rely on artificial inputs. Between 1973 and the 1980s, public fisheries credit programs made more than 90 percent of loan funds to 723 large fishpond operators (Dickson 2003). To encourage development of aquaculture facilities, the government declared the region's mangrove areas "undeveloped territory" and extended fishpond leases to investors who established export-oriented fishponds. Government lease agreements privatize public lands for fishpond development, run for 25 years, and require cheap annual rents. Once the public commons were targeted for privatization, the country's two largest lessees utilized 760 hectares to construct large corporate fishponds in Lanao del Norte (Philippine Annual Fisheries Profile 1977: 12–14). Corporate fishpond developers, especially those with foreign financial backing, were further subsidized through tax abatements. Dole Philippines was given a four-year tax abatement to establish shrimp farms in Mindanao, and the corporation targeted Panguil Bay provinces for fishpond development (Broad and Cavanaugh 1993: 73–89, 178). Some of the most massive fishponds along Panguil Bay are found in Kapatagan where most of the mangroves were privatized for fish farming. Fishponds are concentrated in nearly 80 percent of land, leaving only about 500 hectares for peasant fisher households. One corporation monopolizes twice as much productive area as the entire peasant fisher population. San Diego Fishery Enterprises operates a fishpond of more than a thousand hectares that spans three coastal communities. Specializing in export fish and shellfish, San Diego is one of the country's largest agribusinesses.[9]

9 Interviews with BFAR and Dept. of Agriculture staff. In 1985, the Philippine Supreme Court found San Diego corporation guilty of unfair labor practices.

Export-oriented monocultures have been developed mostly by large-scale enterprises, concentrating the region's resources into the hands of a few resident and absentee investors. Less than 2 percent of the region's fishers control access rights to ecological resources while peasant fishers are restricted to limited areas of the Bay and its connected streams. Similarly, capture fishing is dominated by 43 firms that utilize large commercial boats to gather 79 percent of the catch from the wild. Financed by these large firms, 30 percent of middle-sector fishers employ more exploitative technologies to capture most of the municipal output.[10] One fisherwife pinpointed the difference between the majority of peasant fishers and those who monopolize resources. "Only those who are able to earn income every day will always have food. Richer fishers will not go hungry like most of us. There are days when we cannot catch enough fish for the day's needs."

Through its integration into global markets, Panguil Bay has been transformed into a *commodity-chained* fishery that marginalizes the peasant communities that are highly dependent on small-scale fishing and gathering. According to the fisher coalition Kilusang Mangingisda, "only a few wealthy companies see any profits from intensive aquaculture. On the other hand, millions of people in coastal communities, once protected by mangroves and other natural coastal barriers, now are left vulnerable to natural disasters" (*Philippine Daily Inquirer*, 18 April 2008). Mangrove destruction eliminated household access to many natural resources that supported their livelihoods, such as wood, fish, shellfish, and wild foods. Every acre of lost mangrove means a decline of $800 to $3,600 a year in resources that once contributed to peasant fisher livelihoods (Borrell 2010: 51). When fishponds redirect waterways or cause drying of rivers, peasant fishers are cut off from the Bay. In Lapinig, for example, only a shallow irrigation canal links fishers to coastal waters, forcing them to carry boats and gear overland. Fishponds close off household access to Panguil Bay and the mangroves, and many fisher families face legal sanctions if they move through private corporate territory. Consequently, privatization of the commons transformed peasant fishers into squatters who are vulnerable to removal by government leaseholders. While most of the households own their own dwellings, they do not hold title to the public lands on which their houses are built. Under the terms of government leases, peasant fishers are no longer permitted legal access to the mangroves, and fishpond operators can take action against these "trespassers." In addition to forced relocation of peasants nationwide, government leaseholders restrict gardening, livestock

10 Analysis of Philippine Annual Fisheries Profile (2006) and MSU Naawan Foundation (2006: 90–93).

raising and resource gathering. Some of these pond operators are quite repressive, forcibly removing dwellings and employing brute force to constrain villagers.[11] For instance, the 400-hectare Santos shrimp farm near Kapatagan did not relinquish corporate control over the land after it stopped production, as government regulations require. Instead, armed security guards were maintained around its perimeter.[12] Interviewees reported that these guards fired at them when they gathered resources from the mangroves. To avoid violence, fisher families paid bribes, relinquishing to guards part of their meager harvests.

Interviewed fishers complained about seven types of loss of ecological access that were caused by export producers. All of them expressed concern about fisher landlessness, especially the uncertain land tenure of their dwellings situated near fishponds that lease public lands. Three-quarters of them pointed to commercial trawling and commercial stationary nets in municipal waters as the sources of over-fishing and the worst forms of ecological degradation and depletion. Three-quarters of them also contended that fishpond operators and commercial fishers have powerful political connections who shield their illegal activities from local government policing. Nearly 60 percent of the peasant fishers were concerned that fishpond operators will not permit gardening, livestock raising or mangrove gathering on leased lands that were once public commons. One-third of the interviewed fishers complained that fishponds block fisher access to coastal waters, forcing them to carry their boats overland. Similarly, one-third complained that village flooding is exacerbated because public infrastructure is situated to protect fishponds rather than dwellings. More than 30 percent described instances in which rivers and creeks had been blocked for fishpond development, and another 20 percent described illegal logging for fishpond construction that destroys biodiversity and shallows rivers. Nearly one-fifth complained that there was little area for seaweed farming due to pollution from fishponds. About 9 percent of the fishers argued that fishpond operators politically oppose local government funding of livelihood projects for fishers.[13]

Public policy also privileges large producers though government unwillingness to regulate illegal activities, such as logging (MSU Naawan Foundation 2006). In 2001, Aurora fishers protested the failure of national and local governments to end illegal logging. The local fisher association pointed out that

11 Fishers who reside in leased areas of seven communities of Bonifacio, Tangub City, and Ozamiz City, as well as those who reside around ponds of LAICOR, have been particularly vulnerable to evictions (MSU Naawan Foundation 2006: 145).

12 National regulations require that holders of Fishpond Lease Agreements relinquish control over the assigned land when the fishpond has been inactive five years.

13 Analysis of our interviews and MSU Naawan Foundation (2006: 371–83) interview data. The sample size was 552 peasant fishers.

Aurora attracts commercial logging because it "has the widest forest cover" remaining along Panguil Bay. The fishers claimed that national officials "were bribed and under the payroll of those logging companies" and that military officials were "protecting the logging operations."[14] To complicate matters, local government officials have neither dismantled the largest illegal stationary nets (e.g., sangaab) nor prosecuted operators.[15] In the words of one outraged fisher "sanggab devours the seas. This was our demand before, to dismantle the sanggab. When sanggab was dismantled, there were lots of fishes caught in our wooden boats. But now when sanggab is back, we catch very little." Several informants explained that these large stationary nets require such a high capital investment that they cannot be enterprises of most peasant fishers. Indeed, the higher class positions of owners account, they argue, for the unwillingness of community officials to prohibit and dismantle these illegal devices. Moreover, fishers are convinced that dynamite fishing is far less destructive than the commercial sanggab. "The dynamite fishing is better than sanggab," commented one fisher. "We all believe the dynamite fisher is the lesser evil. There are many more fishponds and sanggabs, so they destroy far more fish and natural resources than the few dynamite fishers."

As MSU Naawan Foundation (2006: XXVIII) observes, peasant fishers complain more about "the inability of local governments to effectively curb illegal and destructive fishing activities" than about any other problem. In our interviews, fishers explained that government failures result from two contexts that privilege large operators. On the one hand, illegal operators have powerful political connections who intervene to shield their activities from local government policing. On the other hand, fishers emphasize problems with local governance that leads to public failures to police the violations of large producers: (1) the absence of a Bay-wide fishery code and of a political body in charge of regulation of the Bay; (2) lack of budget for law enforcement; (3) lack of cooperation across communities and/or municipalities; (4) corruption of local political leaders by commercial operators, and (5) unilateral policing of peasant fishers while illegal activities of the largest producers are ignored.

In addition to constraints on access to fishing resources, peasants are marginalized from seaweed farming resources. Indeed, two-thirds of all sales are made by the twenty largest producers, and parcels are disproportionately assigned to the largest producers. Because Misamis Occidental is sheltered

14 Republic of Philippines, Forum website, 23 Oct. 2001 (no longer online).

15 For a map of stationary gears in Panguil Bay in 2005, see MSU Naawan Foundation (2006: 95). Despite a 2015 public announcement that illegal stationary gears would be removed (Enerio 2015), those gears were still in the Bay in 2016 and 2017 (Jumawan et al. 2021).

FIGURE 23 Fisherwoman near Tangub City. Females in fishing households have been stereotyped as housewives who leave fishing in boats to males. We observed and photographed many females, like this one, engaging in such fishery work that most scholars, NGOs and public officials claim is only done by males

from typhoons and is amenable to year-round production of this commodity, more than 90 percent of Northern Mindanao's seaweed farms are concentrated along the coastal waters of this province. Consequently, nearly three-quarters of the regional seaweed growers are located in Ozamiz City. Even though San Roque has 113,054 square meters of seaweed farms, the largest fourteen planters control two-thirds of the territory, leaving the vast majority of peasant growers to compete for use of the remaining third, most of which are situated in the unproductive shallows.[16] Seaweed farming is an enterprise that is feasible for only a small proportion of middle sector peasants. Fishers who want to begin farming "find no area," complained one frustrated peasant. On the one hand, most of the shallow areas are already occupied, and most peasants do not own the equipment to utilize deeper sea areas. "To plant seaweed in the deep seas requires capital, and the small fishers cannot afford to start it," a fisher explained. The financial investment to engage in seaweed production in

16 Interviews with local officials, NGO staff and Ozamis City Agriculture Office.

deeper water is prohibitive, each line costing about twice as much as a line in the shallows. On the other hand, leaseholders market their idle parcels, making it impossible for a poor peasant to acquire a growing area legally. Local regulations require growers to forfeit a site that has not been cultivated in the previous three years, but most parcel holders sell or rent their spaces. "Why are they selling the sea when it's not theirs?" queried one fisher. "The seas belong to Nature."

5 Debt Bondage as Externalized Cost

Debt bondage is the third category of production costs that exporters have externalized to Panguil Bay fishers. If we assess the modern world-system in terms of how a majority of the world's workers spend their lives, the defining characteristic of capitalism is *nonwaged* labor (Wallerstein 1987: 319–20), not the industrial waged laborers that are touted in western development models. Over the history of capitalism, far more laborers have been trapped in contexts of debt bondage than have ever been proletarianized. Indeed, indebted laborers make capitalist enterprises highly profitable (Brass 1999). Trading on the world market bears high costs for incorporated communities because they must re-orient domestic-oriented production systems toward export commodities. Consequently, the Panguil Bay fishery has been transformed into a *putting out* system that has reshaped traditional pursuits, generated dependency on imported production inputs, and stimulated debt bondage. As export production was entrenched, more exploitative fishing technologies have been adapted, and those new gears require financing. A prime response by impoverished fishers to the need to meet debt obligations has been to increase seafood outputs for market disposal. Relentlessly, Panguil Bay peasant fishers have been locked into a putting out system that draws them deeper into debt bondage while their surpluses are extracted by capitalist exporters and distant consumers.

5.1 *Historical Structuring of Peasant Fisher Debt Bondage*

Philippine fish marketing changed after World War II, as the country became more deeply embedded in the emergent global food system (McMichael 1994). In this period, foreign control over agricultural and fish exporting firms was widened, as US corporations established American marketing strategies and vertical organization of trade. While the US and Japan controlled a majority of large production and distribution firms, Chinese investors dominated wholesale and medium-scale trading firms. As a result, Filipinos were concentrated

in small scale trading at the local level (Dannhaeuser 1979). By the end of the 1950s, the foreign term *suki* became entrenched in the country's commercial fish trade to refer to marketing and credit relationships between different levels of sellers, wholesalers and retailers who were integrated into national commodity chains.[17]

By the 1970s, the new vertically-integrated trading system was working well enough that scholars documented linkages between local small traders and large wholesalers and exporters. In the late 1960s and early 1970s, trader advances against future production and credit linkages to fish selling were rare (Szanton 1972: 106–107; Davis 1973: 165). Moreover, most small and mid-size traders did not extend credit or have connections to a regular clientele of fishers from whom they bought. At that time, small fish traders extended credit and financing only to middle-class peasants with stable incomes, so the vast majority of fishing households did not have credit privileges with the traders to whom they sold their outputs. By 1975, however, debt linkages were entrenched between local fish sellers and larger traders and wholesalers. Larger traders and wholesalers financed lower-level traders, who, in turn, extended credit to a small base of fishers. Small traders were economically precarious, half of them women, so a high proportion of them were trapped in a debt bondage relationship with larger traders and wholesalers. Large traders externalized risks, such as spoilage and price fluctuations, to small traders who, in turn, externalized those costs, high interest rates and below-market prices to fishers (Davis 1973: 170–93).

By the mid-1970s, credit was "the essence" of the economic relationship between fishers and traders, and debt bondage was common among middle sector peasant fishers. Davis (1973: 218, 224–225, 249) argued that "the overriding consideration is credit, and marginal discrepancies in prices are tolerated. Most would not choose to lose sources of credit by breaking off the relationship. ... In practice, the total obligation owed to the [trader] is rarely removed entirely." By the end of the 1970s, debt bondage was so prevalent and fisher living conditions had declined so significantly that a 1979 description could just as easily apply to today's Panguil Bay fishers. "On extreme days when bad weather precludes any fishing...the day's meals consist of rice and salt and nothing more. Even on good days the catch is so low that it does not go far

17 Dannhaeuser (1979) claims that the term *suki* is of Chinese origin and probably became entrenched in the country's trade/credit jargon in the 1950s to refer to small Filipino trade relationships that were integrated into corporate trade networks. For description of the exploitative aspects of suki trade arrangements in fishing, see Hopkins and McCoy (1976).

when sold in order to purchase other necessities. ... With no savings and material possessions, the poorest fishing families can never hope to secure loans for gear purchase from collateral-minded banks. ... With little or no education, and few non-fishing skills, the poorest fishermen have little hope of shifting to another occupation" (Smith 1979: 22).

By the mid-1970s, transfer of raw materials from outlying rural areas to Manila was structured as the best method to process and re-export goods inside and outside the country (Davis 1973: 170). Moreover, about half of peasant fishers were tied to traders through debt bondage. As a result, debt bondage caused "continual decline" in the standard of living of fishers. Due to the extended low-income non-fishing period, many of the fishermen were "perpetually in debt to the lenders" (Hopkins and McCoy 1976: 10–11). By 1980, large traders and wholesalers who had more capital and access to transport held "monopsonistic control over external marketing" of local fish. Scholars reported that this relationship led to lower prices being paid to fishers than would be the case if they could choose the marketing outlet. "In Panguil Bay communities, credit ties to wholesalers, who have first refusal of the catch, prevent the fishermen from taking advantage of high local prices in times of low supply. At such times, prices paid are kept low by the wholesaler who transports the fish to provincial market centers" (Smith et al. 1980: 52). It was debt bondage that maintained the relationship, allowing the trader to monopolize a segment of the supply chain. Between 1975 and 1985, scholars viewed trader credit advances "as a calculated means to extract produce via debt claims, which places the producer in a dependent, exploited position" (Fegan 1981: 12).

By the mid-1980s when national development strategies initially targeted Panguil Bay for increased export outputs, the linkage between fisher debt and marketing was in place at all trading levels. Russell (1987) observed that it was common practice for middle-sector traders to act as moneylenders in order to acquire the outputs of fishers and fish farmers. It was through local traders that a majority of peasant fishers were integrated into export commodity chains. By 1990, a majority of local traders offered credit and capital advances to small fishers, but new export standards made the debt bondage more pernicious. Traders devalued fish for local consumption and specified the kinds, sizes, prices and marketability standards of species that were "valuable," those preferences a careful reflection of global market demands as determined by larger traders and wholesalers. Several types of petty and larger capitalists extracted part of the surplus value of peasant fish outputs and of local fish farms. Each lower-level trader was both an exploiter and an exploited actor, as higher agents in the commodity chain extracted surpluses, effecting "multiple relations of exploitation" (Aguilar 1989). In this trading chain, "all roads led

to Manila." Consequently, several levels of traders integrated peripheral fishers in areas like Panguil Bay into the distribution structure that moved their raw products to fuel economic activities obtaining in the country's export center (Ushijima and Zayas 1994: 86–87, 230). Some scholars called attention to trader/wholesaler use of credit to capture a wide scope of nonwaged labors. Rutten (1990: 198–99) described the "extension of credit as an instrument of power and control" over unpaid and low-paid labors in fishing households. According to Fegan (1981: 97–98, 125n18), the trader/lender secured claim to the entire production of a fisher household that was obligated to repay debts which were incurred because fishers were paid too little for their outputs to cover their production costs. In this way, the non-fishing labors of the household were drained to cover the debts accumulated to cover fishing gears and dwindling catches.

5.2 *Contemporary Credit and Finance Mechanisms*

Clearly, wage earning is not the primary mechanism through which Philippine peasant fishers have been integrated into the capitalist world-system. Instead, these households primarily provide *nonwaged* labors to capitalist commodity chains that, in turn, extract surpluses from them and externalize costs of production to them. These kinds of exploitative credit mechanisms are not culturally or economically peculiar to the Philippines, for fishing communities in both developed and developing countries have exhibited similar patterns of debt bondage.[18] Debt bondage to traders and financiers has expanded over time as fishery exporting has been more entrenched. Since 1980, the country's neoliberal development goals have widened and deepened fishery exploitation. As a result, the varieties and numbers of traders have expanded and tightened vertical integration of fish marketing. Panguil Bay fishers have been incorporated into this monopsonistic trading system that links indebtedness to commodity marketing in order to allow the exporter (1) to obtain commodities at below market prices, (2) to externalize more risks and costs to producers, and (3) to extract more hidden surpluses from producer households. At all levels, the traders seek to establish a degree of monopolistic control over the commodity supply while externalizing costs of production to primary producers (Clelland 2014, 2015a, 2015b). Long-term credit linkages to lower-level traders and producers insure greater national and international corporate control over fish supply, price-setting and profit margins. In this "tied labor" arrangement,

18 For examples, see Barrett and Apostle (1989); Clark (1995); Ibarra et al. (2000); Nadel-Klein (2003); Gordon (2005).

traders at higher rungs have "captive" networks of indebted smaller traders who supply them with fish secured locally (Ushijima and Zayas 1994).

By the early 1990s, a majority of traders were extending loans to fishers and fish farmers through a system that Filipinos dialectically term "fresh fish by contract." Fishers were tied by debt bondage to traders or wholesalers who advanced capital for fishing gears or household needs, and their future outputs were committed to those lenders until all debts were paid (Ushijima and Zayas 1994). Through the *kasama* system, a trader or broker supplies a boat, a household hut and advances credit to a fisher household. Subsequently, the broker purchases the catch at about half the market price and deducts accumulated debts. Another treadmill of mounting debts accompanied the shift to more productive technologies. As Illo and Polo (1990: 29–30, 39) point out, "the effective range of technologies available to the households is constrained by their access to funds to underwrite the shift from one fishing technology to another." Local traders made advances to middle-sector peasants to install stationary nets and to purchase boat motors, in return for agreements that outputs would be sold at reduced prices. One indicator of proliferating debt bondage was the modernization of boats, as the number of motorized boats expanded 37 percent between 1991 and 2005 (Philippine Annual Fisheries Profile 1991–2005). In order to support their new technologies, owners also had to obtain repairs, gasoline and equipment on credit (Smith and Mines 1982). Fishers received less than the full market price for their catches, but they paid "excessively for inputs and usuriously for loans" (Pomeroy 1994: 69).

In the early 21st century, Philippine peasant households still do not have access to credit that is not exploitative. Even though government-subsidized microfinance programs are available through banks, very few fishers have benefitted. Nonprofit fishing cooperatives lack sufficient capital to extend credit, so they require borrowers to deposit a set level of savings before they are eligible to apply for loans (JEP-ATRE 2004). Like small farmers, peasant fishers are still dependent upon credit and financing from the traders or firms that market their outputs. Since 1995, debt bondage has operated at three levels.

1. Most poor peasants acquire credit from small local market fish traders who advance small amounts for household needs against future production.
2. At least 60 percent of the peasants fish or farm on shares for traders or wholesalers who advance production capital and household survival needs.
3. Contemporary marketing and investment networks employ debt bondage strategies to finance modern fishing or aquaculture technologies (Interviews).

5.3 *Sharecropping and Contract Farming*

By 2005, corporate-controlled contract farming of export crops and chickens was widespread in Panguil Bay communities (*Mindanao Magazine*, 26 May 2008). Feed mills and large feed traders have employed contract farming to increase corn outputs for aquaculture and livestock feeds (Cruz 1997). In similar fashion, peasant fishers engage in capture fishing on shares. Peasants who do not own equipment fish on shares with technology owners to whom they may remit as much as 80 percent of their harvests. If these owners are family or neighbors, the fishers remit shares of harvests, but do not usually acquire credit.[19] In some instances, the share arrangement is with a local small trader to whom the fisher has a long history of indebtedness. However, most share contracts are arranged by commercial firms. For example, *bintoleros* utilize the boats and crab pots of commercial firms through share arrangements, and most tuna fishers work for months at sea to earn a share of the crop produced on a boat they do not own. Stationary nets are also managed as contract farming in which the costs of construction are advanced by a financier for a set share of the fish harvests. Repairs and losses are externalized to managing peasants. Small stationary net (bungsod) operators along Panguil Bay told us that rising costs are often not offset by catch increases, so operators widen their indebtedness to financiers.[20] Because their occupation is seasonal, share fishers are often deep in debt to the firms with which they contract because they borrow cash for household survival needs against future production. Scholars observed in the 1970s and 1980s that credit was extended without interest, but that is no longer the case in transactions between peasant fishers and larger traders or wholesalers. Interest can accrue at 10 percent monthly, and fishers must pay commissions of 6 percent or more of gross sale value to their lenders.[21]

The second context for debt bondage involves several methods to operate aquaculture facilities on shares. Corporations advance fingerlings and feeds to growers who assume the risk of fishpond operating expenses. Any credit advances are charged against the producer's share when the harvest is delivered to the firm (*Mindanao Magazine*, 26 May 2008). In a second strategy, absentee leaseholders recruit local families to convert mangroves into fishponds and manage them. The most frequent type of contract fish farming is an arrangement in which corporations, traders or absentee investors finance

19 By the late 1970s, this share system was widespread among Philippine small and middle-scale fishers (Herrin 1978: 93; Spoehr 1984: 41n10).

20 Spoehr (1984) observed share fishing of stationary net systems. For tuna sharecropping, see Vera and Hipolito (2006) and *New Humanitarian* (2009).

21 Information from interviews with fishers and local public officials.

fishponds on land controlled by peasant households. Investors finance construction of the fishpond and pay annual "rent" of 5,000 to 10,000 pesos for five years. In addition, monthly wages of about 2,000 pesos and a sack of rice are paid to the operator. Investors only erratically cover the cost of repairs and feeds, instead externalizing these costs of production to the peasant households.[22] In those instances in which the leasing operator provides construction costs and capital inputs to production, the operator receives 50 percent share or less, minus any credit advances. In a third approach, peasants manage fish cages on shares for absentee financiers or traders, typically for less than half the harvest, accruing debts for repairs and household advances between harvests (Interviews).

Monthly income from non-corporate farming can range from a high of $273 to $546 to a low of $91 to $127, resulting in an erratic household budget that can range from more than $18 a day to as little as $3 daily. We interviewed Panguil Bay households that operate ponds on shares with external investors who take as much as a 90 percent share of each harvest. This share is so high because the operators borrow against future harvests to cover repairs and inputs that investors would not cover and to manage household living expenses between harvests. Interviewees reported few positive experiences with these arrangements. One contractor reported that they lost ground because the investor added inputs and repair costs to the operator's indebtedness. After their first successful harvest, "every production cycle failed because of flooding or because bacteria attacked the shrimp." Subsequently, the financier "refused to advance cash for needed repairs and production inputs." When the mud dike was destroyed by flood waters, "the financier did not have it repaired because [they] had a lot of debt already." The household is worse off than before they entered the share contract. On the one hand, their survival needs have not been met. Their diet is far worse than what they could afford when the wife thatched roofing shingles from palm fronds she gathered in the mangrove they converted. The husband reported that "before we converted our mangrove, my wife sold thatched palm, and she always brought home four kilos of meat. She would also buy a sack of rice, some big dried fish and mongo beans. The financier does not supply us with food for consumption anymore. So now, we are just eating the shrimp feed. These are low-quality corn grits that have to be boiled before the shrimp can eat them. If the financier refuses to advance

22 Scholars documented debt bondage associated with Philippine fish farming throughout the 1980s and 1990s. Constantino (1988: 40–60) described corporate sponsorship of fish farms this way. "Saddled with debts they cannot pay, fishers remain tied to the corporation by their contracts."

us new loans because our debt is still big, we have no other option but to eat them." To make matters worse, the investor has the contractual right to take control of the fishpond and hire someone else to manage it until their debts are paid.

Seaweed farming is often organized on shares through financing by Shemberg Corporation, the country's primary exporter of carrageenan (*Philippine Daily Inquirer*, 18 May 2008). To start in seaweed farming, the grower needs at least $9.10 for two or three lines in the shallows, more than twice as much in deeper water where a motorized boat is essential. However, the inability to afford a motorized boat prevents most peasant households from moving from the polluted shallows to deeper water. "Poor people need finance capital," report officers of the San Roque Cooperative of Seaweed Growers. Since their organization has no funds to lend them, producers go directly to traders for marketing and financing. One grower described price fixing by buyers. "The three buyers set the same low price for a kilo of dried seaweed. If we questioned the price, they threatened to stop buying. This low price was only a hoax engineered by the three buyers." Like other growers, his "savings were eventually consumed during this crisis of seaweed marketing."

According to one peasant seaweed farmer, "there is always a buyer who loans capital to seaweed growers, but they must sell their seaweed only to them. In addition, seaweed growers in times of need go to the financier or buyer of seaweed to seek cash advances against their future production. The buyers like to lend money so they can be assured of getting as much seaweed as possible." A female seaweed grower reported, "we only planted three rows and wanted to borrow 2,000 pesos to add one more line. But the buyer encouraged us to increase our loan amount. Instead of selling the first harvest, we had to use the seaweed as seedlings to enlarge the production. This time, production failed, so a bigger loss for us." There is keen competition among buyers because there is high export demand for seaweed, but production has ebbed tremendously. Trying to survive a seven-month downturn in seaweed production, one middle-class grower has lost $200 and pawned most of their household valuables. "Buyers are not complaining about failed production," he reasons. "Only the losing farmers are complaining. Buyers will always profit."

6 Threats to Peasant Livelihoods

Threats to livelihood represent the fourth category of production costs that exporters have externalized to Panguil Bay fishers. Despite erratic economic growth, Panguil Bay has one of highest poverty rates in the country. "A day's

catch only fetches an average income of [less than $1], which is not sufficient for the household's daily food requirements" (ADB 2005: 60–61). Even though the Bay's aquaculture and capture fishing are growing economic sectors, the area's peasant fishers are among the poorest households in the Philippines.[23] Along Panguil Bay, the average gross daily income from fishing declined more than 62 percent between 1995 and 2005 (MSU Naawan Foundation 2006: 143), then declined again between 2005 and 2010.[24]

6.1 *Declining Fish Catches*

Steady decline in catches represents one of the worst externalized costs experienced by Panguil Bay peasants. Interviewees described their average daily catch in the 1960s as "abundant," as "plenty" in the 1970s, as "few" in the 1980s, as "scarce" in the 1990s, and as "nearly dead" in the early 21st century. Even though bungsod stationary nets are capable of large harvests, catches are erratic and sometimes small. For operators with gears in problematic areas of the Bay, bungsod fishing sometimes grosses a monthly average of only about $12.73 (less than 43 cents daily). Fishers using traditional gears face more unreliable conditions. They are less likely to generate enough income to cover debts, basic household needs and fishing gear maintenance. "I must go fishing for food in a small wood boat with no motor," one fisher told us. "Now it's very difficult to get one or two fish that are large enough to sell or trade, even when we cast the net in the afternoon and leave it until the next day." By 2003, fishers in wooden canoes captured less than one kilogram daily, about 6 percent of the average catch in 1969.[25] Fishers were lucky to catch one or two crabs that were much smaller than those they caught two decades ago, and mussel catches had declined more than 20 percent (JEP-ATRE 2004). One Philippine fisher captured the precarious position of such peasant households this way: "A bird wakes up at dawn and immediately flies about looking for food. The bird spends his days doing this. The next day is the same. Me, too. I wake up and scurry around looking for food and work wherever I can find it...becoming dizzy trying to keep my family alive. By evening, I'm tired and weak. At dawn, I have to be up again doing the same, like the birds" (Ledesma 1982: 51).

6.2 *Declining Income*

Export-oriented agriculture, commercial fishing, and aquaculture have not benefitted a majority of Panguil Bay peasants. Exporting to Manila and to

23 Analysis of 2012 Census of Fisheries, OpenSTAT.

24 Analysis of 2012 Census of Fisheries, OpenSTAT.

25 Analysis of JEP-ATRE (2004) and MSU Naawan Foundation (2006).

foreign markets drains away capital and raw materials that could be utilized to develop productive forces in local communities. The costs of that outward flow of resources are externalized to peasant households, as they are deprived of employment opportunities. In this way, Panguil Bay is an extractive enclave that specializes in the export of raw materials, the economic benefits of which accrue disproportionately to Manila where agribusinesses and re-export facilities are concentrated. In other words, Manila's capital accumulation is grounded in the extraction of surpluses from Panguil Bay and all of Mindanao. As a result, a Bay fisher earns only 38 percent of the average gross daily income of a man fishing in 1995 (MSU Naawan Foundation 2006: 143). Consequently, regional fisher households have experienced an income decline that is three times greater than the national average, and there are few options for changing livelihoods. Only 9 percent of the jobs in Bay communities are in nonagricultural activities, so less than 30 percent of Bay adults earn wages outside farming or fishing. Because of high unemployment in Panguil Bay, three-quarters of all households are impoverished, a rate that is nearly twice the national average. Moreover, the proportion of poor Bay residents increased between 1995 and 2005. More than one-third of Bay residents live on less than $1 daily, and a majority live on less than $3 daily. In addition to their declining incomes, household spending capacity has been further diminished by national currency devaluation and by price inflations.[26]

Despite their monopolization of ecological resources, fishponds employ few laborers, and many hired workers are recruited from outside the region.[27] Most fishpond laborers are employed seasonally or to complete short-term tasks. An eight-hectare fishpond requires one technician, five feeders, one grass cutter, and fourteen temporary laborers during harvests. Despite heavy public subsidies, auxiliary facilities generate even fewer jobs. Typically, a single laborer manages a hatchery or a crab fattening facility. An adult waged laborer earns 55 cents daily while a child laborer earns only 14 cents. A pond owner spends fourteen times more on feed and shelter for a kilogram of shrimp then he pays the laborer who constructs and maintains the pond and daily tends to the needs of the shrimp (Primavera 1997).

26 Analysis of RSSIS (Module 6) and national and regional data, Quickstat. Nationally, there was a 10 percent decline in average family incomes between 1995 and 2004 (Schelzig 2005).

27 Local residents reported that many fishpond managers prefer to hire outsiders who have no families that require greater income and resources.

6.3 *Failure of Alternative Livelihood Strategies*

In an attempt to diminish the numbers of fishers, publicly-funded fisher cooperatives have implemented alternative livelihood projects, such as crab fattening in pens, fish culture in cages, seaweed farming, fishpond share farming, banana farming, and production of pigs and chickens. Few of these projects are real alternatives, as most of them funded the kinds of economic activities in which fishers already engaged to supplement household income. Moreover, many of these projects implemented the same kinds of exploitative activities that threaten Bay resources. A majority of these projects failed economically or were not replicated. Several of these projects were the same kinds of fish farming activities that already waste resources, and nine were precarious seaweed farms.[28] Since 2000, 73 nonprofit cooperatives were organized among fishers and coastal residents along Panguil Bay. Most of them closed when public funding of NGO activities terminated (MSU Naawan Foundation 2006: 160). According to one Philippine expert, a sustainable livelihood is one that (1) does not threaten survival of the natural resource base or workers, (2) maintains a consistent and reliable flow of assets, (3) can recover from crises, and (4) and does not drain other livelihoods for support (Asong 2000). Like the export-oriented activities in which they are grounded, the promoted alternatives have not been sustainable when evaluated against any of those criteria. They require front-end investments beyond the reach of most peasants, and most of them are more ecologically damaging than small-scale peasant fishing.

When we queried fishers, fewer than one percent of them were aware of alternative livelihood approaches operating in their areas. Furthermore, they were highly skeptical that such projects would deliver promised benefits or improve their livelihoods. In its assessment of publicly-funded activities to develop alternative livelihood strategies, MSU Naawan Foundation (2006: xxix, 197) indicated that the projects were intended to "divert livelihood activities away from fishing but most of the projects that were promoted were water-based. ... Most projects were also hastily implemented in areas which were deemed inappropriate. ... Selection of beneficiaries of grants and livelihood assistance were influenced more by affinity to the project implementers than by their being in need. ... Many projects...added to fishing pressure instead of reducing it." For example, the Fishery Resource Management Program established a fish sanctuary and a municipal training center to encourage alternative livelihoods in mudcrab cultivation in Lanao del Norte. However, the government program has done little to provide income to most households since the

28 Analysis of alternative livelihood project data, MSU Naawan Foundation (2006: 205–68).

project has been under-funded. Moreover, crab fattening projects are adversely affected by the scarce and unpredictable supply of mudcrab seedstock (Interviews). While a crab lays 3 million eggs, only five will survive in Panguil Bay.[29]

An examination of seaweed farming offers insight into the vulnerabilities of alternative livelihoods that have been promoted by government policies. Couched as an activity to provide a substitute for capture fishing, seaweed farming has expanded along Panguil Bay since 2000 (Philippine Annual Fisheries Profile 2000–2018). However, this type of mariculture has benefitted very few peasants. Indeed, two-thirds of the areas for seaweed farming were allocated by local governments to the largest producers while less than 14 percent of the area is in the hands of small producers.[30] As many of the small seaweed growers are fishers, they have experienced two threatened livelihoods within less than two decades. Since late 2003, Panguil Bay's seaweed production has been showing signs of permanent ecological destabilization. Due to pollution and disease, seaweed gardens of small farmers have stopped growing in the shallows. Monsoons and flooding have exposed the farms to diseases, and milder weather patterns have made the water less active (Interviews). One peasant seaweed grower told us that "shallows are not planted any more because of poor harvest and disease. Those whose areas were in the deeper seas were able to survive the ordeal. The deeper water has stronger current, and this is what the seaweed loves. If water is stagnant, the seaweed growth will also stagnate. Those whose areas are in the deeper sea, their seaweed is all year round while the areas in the shallows are seasonal." Seaweed farming is threatened by the ecological state of the Bay waters which are "too stagnant, not moving enough," causing chemicals, industrial effluents, and garbage to accumulate around the plants.[31] For all these ecological reasons, Bay seaweed households reported that they were accustomed to experiencing at least one instance of seasonal low production every year. After many instances of "failed production," most small seaweed cultivators are in debt.

7 Alteration and Intensification of Women's Work

The fifth category of externalized costs consists of the ways in which women's work has been altered and intensified in the face of the scarcity of natural resources that has resulted from the export orientation of Philippine fisheries

29 Interview of staff, Kapatagan Agriculture Office.

30 Analysis of typescripts in Ozamiz City Fishery Office.

31 Interviews of staff at Ozamiz City Fishery Office and Regional Fish Health Laboratory.

and aquaculture. Because so much of the work to survive is *feminized* by familial gender norms and by public policies (Eviota 1992), wives practice "sacrificial motherhood" (Whitehead 1981) as the most effective survival mechanisms to overcome husbands' harvest shortfalls and debt bondage to traders. As a result, women juggle a *portfolio of diverse labors* to expand the pool of household resources. Without their sacrifices, fisher households could not survive, but their economic contributions are publicly devalued and culturally disrespected (e.g., MSU Naawan Foundation 2006: XXVIII). Work that is *invisible* does not require payment from the capitalist, and hidden costs that are externalized to women and households simultaneously keep commodities profitable for the exporter and cheap for distant consumers (Clelland 2013, 2014, 2015a, 2015b). In reality, however, capitalist commodity chains extract hidden subsidies from and externalize costs to all women's labor spheres, encompassing all their paid and unpaid market-oriented and informal sector work, as well as all their efforts to reproduce and provision households. What is economically and socially hidden is the reality that husbands and more affluent producers are only able to generate export surpluses because wives and daughters engage in a widening portfolio of diverse nonwaged, unpaid and waged labors that provide most of the survival needs of households.

7.1 *Women's Altered Work Roles and Household Survival*

As fishing catches dropped sharply in the 1990s, women undertook new survival strategies to offset the loss of household resources. "While the man stayed in the male world of definite livelihood pursuit, the women increasingly took on 'male' activities in addition to the various [household] chores. ... Those who went fishing alone or with their spouses described themselves as the latter's helpers. ... [Even when a woman] singlehandedly supported her family for a few years, [she] explained her livelihood activities as performance of a wife's duty to help the spouse support the family" (Illo 1995: 219). On the one hand, the female side of the traditional sexual division of labor broke down, as women assumed greater responsibility for men's work (Ushijimas and Zayas 1994: 299). On the other hand, the importance of women's work at gleaning and resource gathering increased as male fish harvests declined.

As we indicate in the Introduction, Daniel Pauly (2006: 16) advises that what is especially needed is analysis of how women in fishing households "literally subsidize male fishers" and make their continued low-paying fishing economically feasible. We found answers to Pauly's question in our interviews. In contemporary fishing households, men could not cling to their fishing heritage if wives and children did not provide unpaid backup labor to their occupation and a vast array of income inputs toward household survival

FIGURE 24 Women harvesting fish. These two wives regularly harvest fish and repair nets in their household *bungsods*, but these types of work are credited publicly to husbands. One woman relies on a traditional wooden boat. As she said, she rows and manages both the boat and the bugsod "like a man." The other woman depends on a motorized boat financed by the trader who buys her harvests. Even these middle-sector peasants are vulnerable to impoverishment because they have many days when their catches are too small to cover household costs and debts

when their catches are inadequate or their debt is too high. One woman told us, "the fisherwife is never free from work." She "multi-tasks" during blocks

of time, as she alternates between reproductive and productive, unpaid and paid labors to a much greater degree than her husband. Consequently, females are involved in a greater number of livelihood strategies than men, and they must shift those livelihoods seasonally or alternate them to resolve time conflicts. In the early 21st century, women are visibly involved in work that is credited to male fishers, and many older wives indicate they always have been. In contrast to public stereotypes, women fish in boats alone, and they manage the harvesting and repairs of large stationary net systems. Nationwide, nearly 7 percent of fishponds are operated by women, women provide more than half the unpaid family labor to these enterprises, and females account for nearly one-third of the wage laborers in fish farming.[32] In many middle-sector households, women engage in seaweed farming and maintenance of large stationary net systems without much adult male assistance. When husbands fall ill, migrate to find waged jobs, or abandon their families, wives assume the full fishing and income earning load, in addition to their unpaid household labor and provisioning activities. Transnational migration of Asian peasants is increasing, and this trend can lead to a heavier female workload. As one wife indicated, remittances from a husband who is abroad are erratic and insufficient to cover household expenses, so she must take on more men's work in addition to her gleaning and reproductive tasks (Interviews).

We draw three conclusions from our interviews and observations of fishing households. First, wives have widened their workloads since 2000, so they contribute more total work time than husbands. As a result, fisherwives bring in more survival resources than men because they have more diverse labor portfolios that blend reproductive and productive, paid and unpaid work. Second, women are highly visible doing work in capture fishing and aquaculture, in the informal sector, and in wage earning that is stereotyped to be *men's work*. Third, women's fishing and gleaning bring in more food resources to households than men catch each day, and their resource gathering and income earning often outstrip the value of male fish harvests. Indeed, female contributions surpass male income in most of the poor households we interviewed. In a national study of Philippine fishing households, Pomeroy et al. (2009) found that the per capita income of women is higher than the per capita income that peasant husbands acquire from capture fishing.

Fisherwives are aware of the degree to which their work outside the boundaries of ideal gender spheres is invisible. One woman told us, "I do anything my husband does, but the community gives him all the credit for my work."

32 Analysis of 2002 Census of Fisheries and 2005 National Demographic and Health Survey, OpenSTAT.

When Philippine fishermen were asked to describe the labors of their wives, 61 percent claimed that domestic chores preoccupy women. In contrast, wives reported to us that they spent more time in household provisioning and external income-earning than they do in child care and home maintenance chores. To complicate matters, a majority of husbands do not acknowledge women's fishing work any more strongly than public agencies. Only 22 percent of these men reported that wives mended nets, a feminized activity that is highly visible throughout Bay communities.[33]

There is another element of evidence that demonstrates alteration of gender roles. In the face of declining incomes and scarce ecological resources, wives are changing their reproductive patterns. Recent research indicates that women more frequently do not want an unplanned child than men (Williams and Sobieszczyk 2003). Nationally, more than 70 percent of all married women and about half of rural married women use contraceptive methods to limit pregnancies. Nearly twice as many Philippine females use contraception as in the early 1990s, and nearly 60 percent of women report they do not want more than two children.[34] Rural Mindanao females more frequently report that their pregnancies are unwanted than do other Philippine women (Juarez et al. 2005). In the early 1980s, more than half of fisherwives were limiting pregnancies while only 37 percent of all Philippine women were employing contraception. Since the 1990s, fisherwomen have exhibited a higher incidence of miscarriages and still births than the national average, raising questions about the extent to which their home deliveries provide opportunities to engage in infanticide as a household survival strategy (Ardales 1981; Eviota 1992). While the termination of free family planning services places them at greater risk of unwanted pregnancies, the Philippine fisherwomen we interviewed were relying on birth control pills and other devices when they could afford them. Even though abortion is by law a crime that carries a penalty of twelve to twenty years imprisonment (Tan 2004), abortion is one of the primary reasons for hospital admissions of pregnant women and one of the top three causes for maternal mortality (BasicsII 2004). One of every eight Mindanao pregnancies is aborted (Juarez et al. 2005), a rate that is only slightly below the country's urban rate. Moreover, breastfeeding is declining, reflecting the need for women to be freed from child care to engage in extra-household labors.[35]

Time allocation studies demonstrate that rural Asian women contribute far more hours to unpaid household labor than husbands (Antonopoulos and Hirway 2010). However, Philippine fisherwives provide more time than

33 Analysis of MSU Naawan Foundation (2006: 201).

34 Analysis of 2017 National Demographic and Health Survey, OpenSTAT.

35 Analysis of 2017 National Demographic and Health Survey, OpenSTAT.

men not only to these unpaid labors but also to extra-household provisioning and income earning. In fact, wives supply about half of total household income-earning effort compared to 42 percent allocated by husbands.[36] Given these trends and the misperceptions that fishermen reflect about housewife labors, it is important to ask whether men are assuming more traditional women's work as female workloads expand. Most wives reported that husbands are gone from home most of the time when they are not actively fishing or earning income. Most reported some assistance in specific circumstances, but that male input is short-term and narrow in scope. For example, many palm thatchers and fish sellers have no time to continue the oyster gathering or gleaning they once relied upon for household protein, but husbands do not take over these roles. In addition, wives complain about husbands' preoccupation with leisure activities (especially drinking, gambling, cock fights, gathering with other males) that consume far more of their time than male household labors.

From the female vantage point, labors are far less gender-segregated than public reports (e.g., MSU-Naawan 2006) claim. From the male perspective, however, that portfolio of diverse labors that comprises what it means to be a "fisher housewife" remains largely gender-segregated. However, we observed numerous households in which males must, of necessity, stay at home while wives are working externally. During that time, they cared for children and/or elderly kin, they cooked and did some cleaning, they gathered water and fuelwood, they completed daily household marketing when they sold their daily catch. However, they did not take responsibility for other significant housewife roles, particularly the gleaning, informal sector production, inter-household networking, and household credit arrangements that are essential to the household survival pool.

Gender-segregated work roles are simultaneously fluid and inflexible. As women push the boundaries of what is expected, many men adhere tightly to traditional gender boundaries. Despite these male rigidities, pursuit of new economic activities for survival forces the alteration of gender roles. Philippine scholars have observed that rural households modify gender work roles most rapidly in two contexts: (a) female-headed households associated with male labor migration and (b) households in which female contributions

36 Work time was estimated using interview data and field observations. Spouses were asked to estimate work hours over a one-month period during men's active fishing season. Unpaid household labors include reproductive tasks, household maintenance, care giving, resource gathering for consumption, credit arrangements, resource budgeting and allocation, and inter-household networking.

equal or exceed men's declining income. In these contexts, two patterns of gradual modification have been documented. Eder (1999: 106, 120) described significant intergenerational shifting and relaxing of gender boundaries and constraints. By the late 1990s, he observed that households and spouses were engaged in economic activities that transgressed traditional gender roles. He noted that these households "adapted and changed internally, adjusting their behavior toward new labor demands and a variety of other external contingencies." Moreover, he indicated that community gender ideals were "being reinvented, as individuals and households respond and even improvise in the face of changing and sometimes novel circumstances." However, most of his documented alteration of gender roles involved the entry of females into traditional arenas of men's work while they continued to carry responsibility for a majority of household labor.

Women's negotiations to alter workloads sometimes "shifted the locus of power slightly away from the men," but only short-term (Israel-Sobritchea 1993: 39). Two decades ago, Illo and Polo (1990: 88) drew a conclusion about Philippine fishing villages that is still relevant as we move into the 21st century. "Particularly among the poor, the gender-based work boundaries were constantly redrawn by the imperatives of survival. Poor families needed the women and girls to engage in fishing. In contrast, only during brief periods of crises, such as during the women's sickness or after childbirth, did men and boys also move into the world of the females. Thus even in this reconstructed world of fragile gender boundaries, the burdens people carry continued to differ according to gender."

7.3 *Fish Marketing and Female Disempowerment*

Fisherwomen's work has changed in another significant way. Traditionally, wives sorted the husband's fish catch, selecting those to be traded and those to be kept for household consumption. Subsequently, they marketed male catches to small local traders with whom they established long-term selling and credit relationships. In this role, the wife employed the daily fish catch to safeguard the household's daily food needs and to establish a trade linkage through which she secured advances against future catches for household needs (Illo and Polo 1990). The reorientation of fishery production to export strategies has diminished the degree to which wives continue to control the marketing of husband's daily fish harvests. However, the outdated public policy perception is that most wives "are in charge of disposing of the catch of the fishermen on top of their domestic chores" (MSU Naawan Foundation 2006: XXVIII). The scholarly research about this female work role muddies this stereotype significantly, for women have never marketed fish to the degree that public policymakers claim.

In the late 1960s and early 1970s, fisherwives made "irregular appearances in the market," and there were "great variations in the amounts of fish sold" (Szanton 1972). By the 1980s, few wives sold fish every day, and they were undertaking alternate labors to secure household needs (Illo and Polo 1990: 358). By the mid-1990s, only about half of fisherwives were regularly selling their husbands' catches. One female's comments reflected the procedures of those who regularly sold male harvests. As soon as her husband came home from fishing, she "immediately decided where to sell his catch," made the transaction and "handled the money" to secure household needs. Another wife marketed catches only when she could "manage to sell without disturbing things" and when "conditions were right." In other words, she only marketed catches when it did not interfere with her other income earning or resource gathering labors or when she could earn a little extra by selling her neighbors' harvests. Since she rarely met all these qualifying circumstances, the husband "passed on his catch to another seller" most of the time (Mabunay 1995: 261–262).

Since 2000, women's work in relation to husbands' fish catches has changed in two ways. Less than 4 percent of Philippine wives have continued traditional pre-market fish processing (MSU Naawan Foundation 2006: 201). We estimate that less than one-quarter of contemporary wives market their husbands' harvests, and these women do not have sufficient fish to sell every day, making this an unreliable livelihood strategy for them. Marketing of fish catches is a form of women's work that has increasingly shifted to men. While female fish traders are still highly visible in public markets, fewer wives are selling husbands' catches. As women are preoccupied with intensified income earning, informal sector activities or provisioning work, husbands more frequently dispose of their own catches, sometimes using vendor linkages established by their wives. A few of the wives who continue to sell their husbands' catches are full-time fish traders who travel outside their communities to engage in their occupation. Among the households we interviewed, female fish traders sell husbands catches more frequently than wives. A husband is more likely to deliver his catches directly to a female fish trader than to have his wife sell his catch at the public market. While the wife's linkages are oriented toward selling fish for local consumption, the husband's trader moves his catch directly into an export commodity chain, netting him a slightly higher price.

In the 1990s, females gathered and marketed local fishpond harvests. Pond laborers drove the fish toward a large stationary net while the women waded competitively into the water to capture fish for their baskets (Mabunay 1995: 338). Our Philippine interviewees reported that these practices have been discontinued and that marketing of farmed fish and shrimp is controlled by regional wholesalers or delivered to agents of the financiers of ponds.

The numbers of females engaged in fish trading declined by the early 1990s (Israel-Sobritchea 1993), as women were displaced by the trading mechanisms of new global commodity chains. Just as the wife has lost much of her control over the husband's daily harvest, the female fish trader is increasingly marginalized from and disempowered by the vertically integrated commodity chains for export species. Seafood trading is a bifurcated, gender-segregated marketing system. Women are concentrated at the lowest levels, primarily engaged in local trading of fish within the public markets. Females are restricted to handling fish that will be consumed locally or marketed nearby to middle sector traders. Since the mid-1990s, males have dominated the trade in the most valuable seafoods that are destined for export (Israel 1993; Ushijima and Zayas 1994; Siason 2001). While women comprise a majority of small traders in local public markets, they are marginal to the economic infrastructure of these global commodity chains. A majority of these female traders operate at about the same economic level as the fishers from whom they purchase, so fish trading is a hazardous livelihood for them. Because most of them lack the capital to afford license fees, packing and ice methods, and the cost of transportation involved in moving fish to a regional market, most women traders are trapped in the bottom entry level where little credit is required, the inexpensive fish varieties are handled, and most of the transactions are local (Interviews; Siason 2001). Because the capital demands are too high, few women move up the chain to become larger consignment traders, and there are almost no female wholesalers or middle-sector regional traders.

Debt bondage is the second factor that limits the capacity of wives to continue to control marketing of husbands' catches. Increasingly, husbands are required to deliver their catches directly to the traders or wholesales who finance their fishing equipment. Those who establish credit linkages to construct fishponds or to secure exploitative harvest technologies must deliver their catches to their financiers or to the traders who act as agents for their financiers. Many husbands unload daily catches to specified landings where traders or agents take control of their harvests and record their credits toward indebtedness. When the catch involves export species, the traders are almost always males, so both wives and female fish buyers are disappearing from this marketing venue (Interviews).

8 "The Shrimp Live Better Than We Do": Threats to Human Survival

Threats to human survival represent the sixth category of production costs that exporters have externalized to Panguil Bay fishers. United Nations Human

Development Indexes for Panguil Bay provinces are among the worst in the Philippines. In 2010, all three provinces fell below the 60th percentile while the country was ranked at the 74th percentile.[37] Lanao del Norte was ranked among the ten worst in the country. Low scores in health, sanitation, housing conditions, water safety, access to health care and social services, educational attainment and food security accounted for these low scores. In our interviews, peasant fisher households most often reported eight negative aspects of their living conditions. Husbands and wives ranked landlessness as their primary concern, as the land tenure for their dwellings was not legally protected on public lands near fishponds. Two-thirds of the interviewees emphasized lack of health care services, rising school costs and/or lack of an accessible public high school, as well as malnutrition among women and children. More than half the households drew attention to lack of potable water, health problems caused by polluted water and dangerous impacts of flooding. About one-third expressed concerns about sanitation problems, especially inadequate disposal of solid waste and lack of sanitary toilets. Only about one-quarter pointed to lack of electricity as a problem because so many fishers cannot afford it and do not own appliances.

8.1 *Threats to Health*

Integration into global commodity chains causes ecological degradation, loss of access to resources, and food shortages that are externalized as health risks to peasant fishers. As a result, life expectancy for Panguil Bay residents is two years less than for the country as a whole. Due to ecological risks and physical dangers associated with their work, fishers suffer a higher mortality rate than any other occupation in the Philippines. Because of food shortages, iron deficiency anemia and iodine deficiencies are common in Bay households. Vitamin A deficiencies occur in 35 percent of pregnant women and in 43 percent of children younger than five. In 1998, Bay children under five died at 1.2 times the national average, and the incidence of young child mortality was even higher in 2015. Two of every five pregnancies is problematic or life-threatening, primarily due to malnutrition. More than one-third of Bay children are underweight, under-height, and stunted.[38]

Because the commons have been privatized for export production, little space is available for fisher housing and villages. Consequently, peasant fishers reside in high risk areas that are flood-prone, along the edges of chemical-laden

37 Analysis of United Nations (2010) and PSA (2007). The perfect Human Development Index is 100.

38 Analysis of RSSIS and Quickstat data.

FIGURE 25 Collecting untreated water from public spigots is a routine task of children and one of the few household chores that sons often complete. Many Panguil Bay children have year-round diarrheal diseases caused by unsafe water

fishponds, or over coastal waters. Their houses average eight by ten feet, most of them built on stilts for protection against flooding or high tides. A majority of these dwellings are constructed of bamboo and woven palm fronds. One-quarter to two-fifths of households have no toilets. Most of the stilted dwellings along the coast have "no toilet but the sea." While a few families have indoor bathrooms that typically dump into waterways, most still bathe outside their houses, and females wash clothes outdoors in plastic containers or canals.

Unsafe water and water-borne diseases are major health threats. Even though one-third of Philippine illnesses are caused by water-borne sources, the country neither budgets adequately for public water systems nor sufficiently regulates water safety. Even though most Bay households have access to public spigots or community reservoirs, these water supplies are untreated and often contaminated by floods and parasites.[39] Pneumonia, respiratory infections, and diarrhea are among the major causes of death in the Panguil Bay area, and

39 Interviews of Kapatagan Municipal staff.

all these illnesses are either water-borne or exacerbated by repeated exposure to water. This region has one of the highest child mortality rates in the country, and diarrheal diseases associated with bad sanitation and unclean water are the main cause of death for children younger than five. The constant exposure to water, to molds and to water-borne bacteria accounts for the high incidence of respiratory infections which are the primary cause of adult deaths. In fact, pneumonia occurs ten times more frequently in Panguil Bay provinces than in the rest of the country.[40] One Philippine fisher poignantly compared fishpond living conditions to those of fisher households. "The shrimp are treated better than we are. They have electricity and clean water. We don't."

Because most households bathe or wash clothes in nearby canals or streams, the incidence of schistosomiasis is five times higher in Panguil Bay provinces than in the rest of the country. Caused by a parasite found in fresh water, the highest incidence of infection occurs among children aged ten to nineteen.[41] When there is early medical attention, two-thirds recover, but the disease causes permanent organ damage or death when left untreated. Even though schistosomiasis is widespread in most communities around Panguil Bay, health services to control the advance of the disease are rarely available to infected persons (Blas et al. 2004).

8.2 *Loss of Social Services*

In the wake of structural adjustment agreements to shift public funds into economic growth agendas, the Philippine government has made cuts in three public services that have hit fishing households especially hard. Despite higher incidence of several health risks that shorten their lifespans, fishing communities have been left with a shortage of health care personnel. Nearly one-third of all Panguil Bay residents lack access to a health care facility. Two factors have been at play to cause a health care crisis in rural Philippine communities. Even though the Philippines trains 2,000 doctors and 10,000 nurses annually, the country exports a high proportion of these new professionals (Yeates 2009, Valiani 2012). To exacerbate this "brain drain," three-quarters of the country's doctors are concentrated in urban centers. As a result, a majority of rural Filipinos, like Panguil Bay households, must rely on minimally-trained nurses, traditional herbalists and birthing attendants. Two of every five pregnancies is problematic or life-threatening, but most pre-natal care examinations and a majority of baby deliveries are done by midwives. These local nurses can prescribe antibiotics for upper respiratory infections, but there are no other

40 Analysis of RSSIS and OpenSTAT data.

41 Analysis of RSSIS: Module 6.

prescription drugs in the clinic. Less than 40 percent of pregnant women receive prenatal health care during the first trimester or have medical attention for their deliveries. Indeed, a Panguil Bay female is nearly twice as likely as other Philippine women to die during pregnancy.[42] The lack of prenatal and post-natal care contributes to the high incidence of maternal mortality and newborn deaths from blood poisoning (USAID 2004).

The second service to be cut from public budgets and privatized is family planning. While pressuring females to lower birth rates, the Philippine government has gutted family planning services.[43] Because of national budget cuts to meet structural adjustment goals and to speed privatization of health care, local centers discontinued in early 2005 their free family planning services. More than half of wives in fishing households who had relied on free clinic services were left without affordable pregnancy control mechanisms. We interviewed one malnourished wife who had become pregnant within three months of termination of her free birth control pills, and she was alarmed because they could not afford another child.

In the early 21st century, the Philippine government was funded by a USAID project aimed at helping the country to privatize its health care system, by transforming its free contraceptive delivery system to a commercial delivery model. "The program promotes contraceptive products, builds and expands the market and harnesses the active participation of the private commercial companies to ensure the future of family planning. ... Efforts are concentrated on increasing the usage of oral contraceptive pills and injectable contraceptives and expanding the market for these." Not only does the USAID program eliminate free services, but it also shifts the country's family planning strategy away from male condom use and places full responsibility on women for controlling population growth. In a country in which so few pregnant women see a doctor, the NGO associated with this program offers "discounts" on vasectomies and tubal ligations (USAID 2004), surgical procedures that are too costly for the vast majority of poor fishing couples.

Public schooling is the fourth service that has been negatively impacted in rural areas. Less than 60 percent of Bay adults have an elementary education

42 Analysis of RSSIS: Modules 6 and 7.

43 One element of the privatization of family planning was the funding of the Friendly Care Foundation whose mission is to provide "family health and reproductive health services to lower-middle and middle-income groups, estimated to be more than two-thirds of the total population." See https://healthmarketinnovations.org/program/friendlycarefoundationfcfi (accessed 4 Oct. 2021). Since two-thirds of Filipinos are not middle-class, the poor/peasants are not the intended recipients of these services.

while only about one-third finished high school.[44] Many of them reported in interviews that they were unable to go to school because they had to work at home, parents could not afford to send them, or the distance was too great. Consequently, they want their children to have better opportunities. Even when schooling is beyond their economic means, these parents prioritize it among their basic survival expenses, second only to food. However, children are prevented from getting an education in four ways. The most significant deterrent lies in the cost. Most peasant fishers cannot afford the 40 percent of educational costs that are no longer covered by the Philippines national budget. While there are no outright fees for attending public schools, several expenses are externalized to parents. One mother of three elementary children explained: "There are always school contributions." Just like their parents, most of these children will achieve an elementary education or less and not attend high school. Second, high schools are not situated in or near every community, and it is more expensive to attend high school because students are required to pay annual fees and other expenses. Third, acquiring an education is deterred by regional flooding. When a flood washes away bridges and forces people to wade across canals, parents keep children out of school. When it rains, teachers release classes so children will not be caught in flood currents. As a result, the school curriculum is cut short by flooding. Several children have dropped out of school because of their frequent absences due to floods. Fourth, households need children to work.

8.3 *Threats to Local Food Security*

While declining slightly in other Philippine rural areas between 1990 and 2015, malnutrition increased in the Panguil Bay region. Even though their communities are exporting vast amounts of farm produce and seafoods, Bay households are 1.3 times more likely to fall below the food threshold than other rural Philippine households. More than one-third of Bay families lack sufficient food, and nutritional deficiencies are common.[45] Food insecurity is the outcome of radically diminished fish and crustacean catches, mangrove degradation, and the rising prices of grains. Food prices increased after parts of the local diet chain (e.g., tuna, shrimp) were commodified for export. "The socio-economic effects of fish exportation...are particularly negative for the...poorer sections of the population. As a particular fish or marine product variety enters the export market, its domestic retail cost rises...and becomes too expensive for the average Filipino family's food budget" (Tadem et al. 1984: 89). Since 1987,

44 Analysis of regional data, Quickstat.

45 Analysis of 2017 National Demographic and Health Survey, OpenSTAT.

per capita consumption of fish and fish products, vegetables and fruits by Panguil Bay households has declined. In 2008, Bay residents consumed per capita about half as much fresh fish and shellfish as they did in 1993. While the region produced and exported massive amounts of shellfish in 2008, per capita consumption of shrimp was negligible at less than five grams annually. In addition, household consumption of fresh mollusks (e.g., oysters) and crustaceans dropped (Philippine Annual Fisheries Profile 2000: 46, 2008: 63). For example, peasant fishers once captured mud crabs for consumption, but these crustaceans are now redirected for export (MSU Naawan Foundation 2006: 234).

Since Bay households expend 55 percent of their declining incomes on food, price increases hit them hard. "Life has always been hard for people like us. More difficult to survive these days," says one young fisher mother. She is correct in her intuition that prices are rising while they have less to spend. Between 2000 and 2004, Northern Mindanao's consumer price index increased 125 percent, and inflation hovered at 8.6 percent annually between 2000 and 2010.[46] Bay fisher households recognize that if prices had not risen so sharply, their loss or decline in income would not be nearly so disastrous. Their meager incomes do not always provide basic food requirements. A peasant who fishes ten hours every day told us: "If we don't catch fish, we have nothing. Food is difficult because you have to buy it every day. As long as we can buy rice, life is bearable." While fisher households market their dwindling catches at low prices, they must use that declining income to purchase expensive food imports. Income from small fish sales cannot cover the cost of imported rice and salt that have been heavily centralized under the control of a few wholesalers and retailers (Szanton 1972). As one fishing wife observed, "there are many days when we don't earn anything from fishing. Even with what I can earn from peddling my crafts on the streets, our household expenses exceed our income most days. So we spend less on foods because our debts are so high. We rarely have fish, never meat. When they wake up in the morning, the children open all our pots and often find them empty."

Nearly 82 percent of Bay residents do not meet nutritional requirements for energy adequacy. Many fisherwomen reported that there are days every week when their families eat only salted rice or corn grits. Two of every five Panguil Bay citizens are malnourished, compared to one-fifth of all Filipinos. Thus Bay fishing households are twice as likely to experience chronic hunger as other Filipinos.[47] Increasingly, fisher households must compete with export agendas for access to protein and cereals. First, the shift to aquaculture and to export

46 Analysis of RSSIS: Modules 6 and 7.

47 Analysis of RSSIS: Module 7.

crops has caused lowered regional rice production through land conversions and ecological damage (Primavera 1997). Second, massive food outputs are exported while less than 13 percent of Bay aquaculture production is consumed locally. Third, traditional elements of the peasant food chain have been redirected into export nonfoods (see Table 10), shifting significant amounts of land away from food production (see Table 12).

The diet of Bay fisher families has been increasingly limited to corn meal or rice, small amounts of fish, and a few vegetables, with protein missing from many meals and on many days.[48] Having fish, shellfish or meat every day is a luxury in a majority of peasant fisher households. Moreover, the frequent floods destroy household livestock and chickens. In a majority of households, parents complain that the inability to afford rice is their worst worry, as rice is prioritized over any other food purchase. When iron-rich crabs are caught, for example, they are sold to purchase rice or corn. Families explained that they would rather give up the pleasure of eating the crab than to forego rice or corn grits. Consequently, the daily catch must be adequate to supply food fish and enough marketed fish to cover the cost of grain and debt payments. That is why the sharp decline in daily fish catches is so alarming for these households. In addition to shortages, household consumption is far less diversified. More than one-half of fisher households experience serious shortages of fresh fruits and vegetables, and consumption of these foods is erratic in the rest.[49]

Because the price of rice is 1.6 times greater than the price of corn, more than one third of fisher households substitute the cheaper, less nutritious grain. One wife buys one kilo of corn per meal when money is short. "Corn is preferred over rice," she explains, "because we feel fuller." In short, the fisher diet consists of many carbohydrate calories and too few protein-rich foods. The substitution of corn for rice exacerbates protein-energy malnutrition, as well as deficiencies of iron, vitamin A and several other micronutrients. Corn grits, like those regularly consumed by one-third or more of poor households, has practically no nutritional value and weakens the ability of the body to absorb iron from foods, thereby exacerbating iron deficiency anemia. In contrast, rice contains small amounts of fat, dietary fiber, calcium, phosphorous, potassium, sodium, vitamin B_1 and vitamin B_2, and niacin, in addition to 11 percent of the average daily requirement of protein. While providing unhealthy levels of sugar and empty carbohydrates, high consumption of corn and fish with few supplementary vegetables and fruits will also cause deficiencies in calcium,

48 Household interviews and PFNRI staff interviews. Analysis of Philippine National Nutritional Survey (2000–2019).

49 Analysis of RSSIS: Modules 6 and 7.

vitamin A, phosphorus, copper, niacin, amino acids, vitamin K, Omega-3 fatty acids, boron and magnesium.[50] Thus the substitution of corn for rice is a hidden externalized cost for impoverished Filipinos who cannot afford the more expensive grain that has followed the displacement of ricelands for export agricultural and fishery production.

9 Looking to the Future

The continued absence of sex-disaggregated data reinforces female invisibility in public records of production and marketing. However, the most scholarly recent estimates are that Asian women account for 50 percent of the workforce in inland fisheries, 54 percent in small scale fisheries, and 66 percent in large scale fisheries. Moreover, post-harvest trading and distribution are numerically dominated by women. Despite this feminization of work roles, women are largely absent from fisherfolk organizations (Siar and Kusakabe 2020: 24). We found similar changes in the work roles of females in Philippine fishing households. A Panguil Bay fisherwoman poignantly captured the precarious position of a majority of contemporary peasant fisher households when she said, "we fishers are squatters on public lands where the shrimp and fish in the ponds are more welcome than us. Our government celebrates aquaculture as the technology that will make this country globally competitive. But where we live, fishponds consume and defile our waters, and they waste resources that were once our daily foods. We eat less of the wild fish so the fishponds can have more."

50 Dietary information from University of Pennsylvania Health System, www.pennhealth.com, and Thai Food Composition Table, Institute of Nutrition, Mahidol University, online at www.pechsiam.com. In 2015, The PFNRI website recommended a baby formula which contains half cup of corn, half cup of soy, and a teaspoon of shrimp powder.

CHAPTER 6

Endlessly Toiling

The Gendered Inequalities of Fisher Household Survival

Abstract

Our goal is to examine the interplay between global and local by measuring the impacts of export policies on peasant household survival strategies and on women's work. To pinpoint local impacts, we draw upon our ethnographic field research to investigate the gendered inequalities embedded within peasant household survival mechanisms. To parallel the "portfolio of diverse investments" held by capitalist elites, we introduce the concept "portfolio of diverse labors," using livelihood histories and photographs to demonstrate how fisherwives comingle nonwaged and waged labors that have market value with their unpaid provisioning and reproductive work. Next we explore four gendered household survival strategies: management of scarce labor time, arrangement of household credit, restructuring household boundaries, and inequitable pooling and allocation of household resources. Peasant wives contribute a majority of unpaid household and provisioning labors, but they also account for a higher proportion of income-generating work time. Our interviews make it clear that women's work is central to household provisioning, often generates greater income than that earned by males, and provides visible and hidden inputs into the exports that enter global seafood commodity chains. Despite significant contributions, females receive an inequitable share of the household pool while males receive more resources than they generate.

> Our situation before and now has always been one of hardship. The important thing is to be hard working.
>
> (Panguil Bay Fisherwoman)

• • •

> You can only eat if you work hard at fishing. Every day rice must be bought.
>
> (Panguil Bay Seaweed Grower)

• • •

> You must run fast and work hard to catch the rice and something to eat with it.
>
> (Panguil Bay Fisherwoman)

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While households are arenas of greater nurture than can be found in the marketplace, they are also microcosms of the inequities of modern capitalism. Indeed, the household "is not a purely emotional arena of reproduction separate from the real productive work of the marketplace, but rather the relations of the household are both created by and create the relations of the marketplace. One cannot be understood without the other because each cannot exist without the other" (Collins and Gimenez 1990: 168). Two dialectical processes unfold within households. On the one hand, householders need income and resources even more desperately than a capitalist requires investment funds. On the other hand, labor and other surpluses are extracted to subsidize capitalist commodity chains. Thus households must seek their survival essentials from the very system that threatens their safety and persistence. While the last chapter focused on the mechanisms through which fisher households are embedded in market commodity chains, we want to focus in this chapter on the pivotal roles of women and the gendered inequalities within these households. We will examine five mechanisms that peasant households employ to survive the immiseration and the resource scarcities caused by export capitalism: (a) development of a *portfolio of diverse nonwaged, unpaid, and waged labors*; (b) management of labor time; (c) arrangement of household credit; (d) restructuring of household boundaries, and (e) pooling and allocation of resources. Recognizing that the fisherwives we interviewed often stated ideas far more graphically and poetically than we can in academic jargon, we include as many female voices and work histories as possible in our analyses. If you come away with an overwhelming sense of the exhaustion and apprehension for the future that permeates their lives, we will have achieved our goal.

1 Conceptualizing the Semiproletarian Portfolio of Diverse Labors

Since they are semiproletarianized and do not depend on consistent formal sector wages, most Asian fishery households survive by diversifying the labors

of as many family members as possible. Historically, households have woven together a creative tapestry of reproductive and productive labors in order to accumulate a consumption fund adequate to sustain their members. Thus "the production and reproduction of labor power have always been based on a mix of wage-labor with nonvalorized domestic, rural, and artisan labor" (Tabak and Crichlow 2000: 31). Householders have routinely superimposed several types of income-generating labor upon their domestic responsibilities, and females have played crucial roles in the household's portfolio of diverse labors. Because more females are becoming economically active, unpaid household labor is the principal activity of only one in four women in Asian countries (UNICEF 2007: 38–39).

Most Asian households juggle an ever widening work portfolio, in order to have a security net that provides a "hedge against failures in any one component of their survival package" (Karim 1995: 218). They practice "risk spreading" through diversification and shifting of livelihood strategies in order to be less vulnerable to the loss of income or resources in any livelihood. Thus a semiproletarian household articulates several nonwaged, unpaid, and waged activities in a complex portfolio of eleven categories of labors. Typically, women engage in five types of unpaid household labor, including biological reproduction and child rearing, household provisioning and maintenance, labor inputs into an income-earning family enterprise or farm, inter-household networking, and/or unpaid community service. Second, households engage in informal sector activities, including home-based activities to generate goods and services for local markets, informal waged labor, enterprise ownership, and labor indenturement of household members, especially children. Finally, households can simultaneously be involved in one or more types of income-earning labor, including waged or salaried work, home-based putting out systems and remittance from household members who are transnational migratory laborers.

The first survival mechanism that Panguil Bay fisherfolk employ is the organization of a portfolio of diverse paid and unpaid labors that occur inside and outside their households. While Panguil Bay fishing households note with growing alarm the environmental degradation and depletion of marine species, they maintain an anxious determination in the face of changes they cannot control. "If we work long hours, we can always take some food from Nature, but it's often not enough." To generate cash income, "the important thing is to be hard working at something other than fishing." Survival demands effort from all household members, especially if they are to accumulate the daily cash needed for grain purchases and school expenses. In the sections that follow, we will examine five elements of the labor portfolios of fisher households (Interviews).

1.1 *Women's Unpaid Household Labor*

The first element of the labor portfolio of Panguil Bay fisher households consists of several forms of unpaid women's work. Fisherwives who were alive in the 1980s have "vivid memories of their mothers bent over something: an infant or toddler, an open stove while cooking their meals, a load of washing, a basket of fishery products" (Illo and Polo 1990: 110).[1] From those mothers and grandmothers, today's fisherwives learned their creativity at identifying an array of activities to acquire household provisions. Fisherwives told us that they allocate more of their total lifetime of work to household provisioning and to unpaid assistance to husbands' fishing or fishpond work than they contribute toward bearing and rearing children and doing mundane housework. Moreover, they reported that they expand their provisioning through nonfishing livelihoods any time food inputs from fishing decline. One fisherwife captured the realities when she said "women are always tired because we have multiple tasks inside and outside our homes. But men only do one thing– fishing!"

While husbands and children share responsibility for daily collection of water and fuelwood, the most important provisioning activity of women is to supply protein through their resource gathering. Wives must identify substitute foods for the exported fish, shellfish and crustaceans that were once integral to their diets. Women accumulate household protein by gathering mollusks and crustaceans from reefs and tidal flats, by fishing with hook and line or spears, by collecting fallen nuts, and by raising poultry and livestock. "Reef gleaning, the special fishing area of women, has a number of advantages. Not only does it supply significant quantities of protein, it also supplies them much more regularly" than male fishing or wages (Chapman 1987: 276). It is not unusual for the total daily catch of females to exceed the fish catch of husbands. In 2005, gleaning wives averaged 12.2 kilograms daily, spearfishing women averaged 4.9 kilograms, and male fishers averaged daily catches of 3.2 kilograms (Philippine Annual Fisheries Profile 2006). Females fish with scoop nets, traps or baskets around reefs, and some spear fish in rivers. It is not unusual for wives and daughters to fish alone in boats, or to manage their households' stationary nets. About one-third of fisher households raise livestock, often on shares (especially cows, hogs, or sheep). To overcome their lack of land access, some households raise pigs in cages that hang out windows to allow waste to dump into adjacent rivers or Bay waters.

In addition to protein provisioning, some women cultivate or gather fruits and vegetables. They gather wild fruits, nuts and herbs from mangroves and

1 We explore women's unpaid reproductive household labor in a later section.

fallen fruit from nearby farms. Households without access to farm land engage in agriculture in several ways. A few households arrange crop share agreements to plant cassava and corn for consumption. Most households cannot afford to farm, however, because they do not have access to a work animal. If they have enough cash to invest in pots, vegetables are raised without access to land. Wives sometimes plant yams and vegetables along fishponds, often remitting a share of their harvests to owners.

The stereotype that fishing is a *male* activity has predominated in studies of Philippine fishing communities for more than four decades (cf. Herrin 1978, MSU Naawan Foundation 2006). In reality, fishing should be viewed as a household-based endeavor with significant direct inputs and hidden subsidization by women. In the past, many wives marketed the fish captured by their husbands (Lopez-Rodriguez 1990; Siar et al. 1995). However, fisherwives are involved in several other unpaid labor inputs into their husbands' enterprises. Nationwide, women account for 56 percent of the unpaid family workers involved in market-oriented enterprises that are home-based, and rural females provide an even higher proportion of these labors.[2] In contrast to the male-only stereotype, women are far more involved in fishing in boats than a majority of studies acknowledge. In the 1980s and 1990s, 78 percent of wives fished with husbands in their boats while 22 percent fished alone in boats (Castro 1986; Illo and Polo 1990). The recollection of a regular dawn fishing trip by a late 1980s fisher couple draws attention to the willingness of wives to take personal risks for livelihood. While the wife was hauling up their net, sudden high winds and waves capsized the boat. She held onto floating paddles and worried about drowning, but she still instructed her husband to save their catch. While she flailed desperately in the water, he threw his body over their net filled with crabs because he thought this catch would satisfy their trader debts (Illo and Polo 1990: 90). Since the mid-1990s, more females have been visible in small boat crews near shore (Krinks 2002). Two-thirds of the fisherwives we interviewed reported that they have actively worked with their husbands at fishing in boats throughout their married lives. The other one-third indicate that they regularly fish with husbands for short-term periods. Moreover, women still complete half to three-quarters of all pre- and post-harvest fishing work (Interviews).

Fisherwomen analyze the gendered inequalities of work allocation, but they do not employ the household/waged labor dualism that typifies many western feminist approaches. In our interviews, they emphasized commitment to household survival, and they voiced pride in their "housewife" labors.

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2 Factsheet, 2007 Census analysis, PSA; Eviota (1992); Mabunay (1995); Illo (1995); Encarnacion (2007); Siar and Caneba (1998); Israel-Sobriotchea (1993).

They assessed value in terms of household needs, not market prices. But they did not devalue their contributions in the ways that some western feminists have observed in other contexts (e.g., Boydston 1986). This Panguil Bay fisherwife captured the nuanced assessment of women's diverse labors that we repeatedly heard in our fieldwork.

> I don't think about whether my work is inside or outside my home. Everything I do is work needed by the household. The work that pays cash often supplies less food than my [unpaid] work gathering from Nature. So I don't define work in terms of money it brings in. My housewife work, inside and outside the home, is just as important as my husband's fishing on the river. Sometimes, I actually bring in more income or food than he does. Men's fishing is difficult. But there is so much more time involved in the wife's work. Besides our other tasks, wives help the men with their fishing.

However, women's unpaid household labors are "not recognized as part of the production process" (Israel-Sobritchea 1992: 279). A "cloak of invisibility"(Antonopoulos and Hirway 2010: 230) is thrown over the economic value of these unpaid household labors by public accounting (Encarnacion 2007) and by public agencies (e.g., Philippine Annual Fisheries Profile 2007). In our interviews, fisherwomen described numerous unpaid inputs into their husband's fishing, including: boat rowing while husbands hauled nets; net hauling while husbands rowed boats; installation and repair of stationary nets, especially bungsods; harvesting catches from stationary nets; mending nets, crab pots, bamboo traps and other fishing equipment; weaving fish baskets or crab pots; helping to carry boats to and from water; helping to lay bamboo traps or crab pots; preparation of baits and hooks for fishing trips; preparation of food and other provisions to be taken on fishing trips; marketing catches; negotiation with relatives or neighbors for use of boats or fishing equipment; and arrangement of credit for repairs of boats or fishing equipment.

Women's unpaid labor inputs into fish farming are even more socially and economically concealed than female fishing efforts. When these women work alongside their husbands in a small family fishpond, their work is socially concealed and is economically devalued. In households that manage small fish farms, wives release fingerlings for each new production cycle, and they process and classify harvested species before delivery to traders. Wives often assist wage-earning husbands with pond feeding, repairs, harvests, and the collection of wild inputs to sell to their employers. In rural Philippine households, like those along Panguil Bay, there are three times more females among unpaid family laborers than males (United Nations 2003). Historically, such female

work has not been considered economically valuable by husbands or by their communities (Boydston 1986), as has also been the case in the Philippines. Similarly, the significance of child laborers is overlooked and devalued. In reality, fisher households expand their survival pools by maximizing child labor. Many households increase the number of income earners by removing children, most often girls, from school to earn wages or informal sector income, to beg on the streets, or to assume the household or provisioning labor that an income-earning mother can no longer handle (Interviews).

As we see in the household case studies that follow, fisherwives routinely provide unpaid work to their husbands, and they must regularly find ways to overcome the shortfalls caused by male low wages or declining catches. If they require cash, they sell surpluses of the same resources that they produce for household consumption. In most fisher households, wages are more erratic and less economically valuable. Consequently, *we should reverse the western conceptual thinking to consider wages to be a supplement to the unpaid provisioning efforts of women.* For example, Bels and Doy are one of the youngest fisher couples we interviewed along Panguil Bay, and their living conditions are below average. With three children aged one to eleven, they struggle to survive on 19 cents per capita daily. Two children walk to elementary school, but the parents struggle to pay their school fees. Three adults and three children live in a small hut constructed from bamboo and woven palm. Their house has no electricity because they cannot afford this luxury. There is neither indoor nor outdoor toilet, so the family uses the beach area. They carry water from the public faucet twenty minutes away, and they collect firewood from the disappearing mangrove behind their house. They live adjacent to a fishpond whose owner does not permit peasants to garden, but they cannot afford to invest in pots to grow vegetables.

Bels is pregnant for the fourth time in eleven years, averaging a baby every 2.8 years. Even though she receives free regular prenatal checkups from the midwife at the community health center, Bels has had to work at hard physical labor most of her pregnancy. Until she reached her seventh month of pregnancy, Bels supplemented family income by working as a washwoman for a middle-class urban family for $7.27 monthly.[3] She plans another midwife delivery at home, even though she is visibly malnourished and chronically tired. When they were first married, Doy was employed by a fishpond operator. Even though he earned only 54 cents daily, they saved a little. At an average of $1.63

3 All monetary values are expressed in $US. In order to insure that we are comparing monetary values that were not distorted by inflation over time, we standardized all values at the 2000 exchange rate with the $US.

daily for the same job at another fish farm, they are not making ends meet. In fact, the household has lost ground in spending power over the last decade due to currency devaluation and price inflation. Doy supplements his wages by gathering small shellfish from the wild to feed the shrimp, for which the pond owner pays him $1.82 on a good harvest day. However, this ecological resource is nearly extinct around his village, so he must travel to the opposite side of the Bay and work all day. For family consumption, Doy fishes with hook and line during high tide. Bels labors long hours gathering and processing oysters. To supplement the household diet and income, Bels is raising three chickens and one hog, and they are producing two other pigs on shares with the owner. While most of the household's food is supplied from fish and oysters, they can purchase a few essential items on weekly credit at a grandmother's sari-sari store.

In contrast to Bels and Doy, Manang and her husband are in their late fifties. They combine fishing and oyster gathering as the core of household survival, but oysters have been more significant over the last decade. Every day, Manang uses the lunar calendar to determine the forecasted time for the low tides. Once the tidal flats are exposed, she wades– feet, heart and mind– into the slimy dark mud of the mangrove floor to gather oysters. She toils two to three back-breaking hours in the mud. Alternately bending, sitting on a leg, and struggling to another location, she meticulously detaches oysters from tree trunks and rocks. She gathers a pailful daily, then works another two hours to remove the meat from the shells. There are three adults and three teenagers in the household, and their three married children live nearby. Since Manang and Bert were married, their primary sources of livelihood have always been fishing and oyster gathering. In 1976, they were evicted from their assigned bungsod area when the fishery authorities created a fish sanctuary. "Everybody was assigned their respective areas by local government officials for a concessions fee," she explains. "Whoever gets the area first is the only one who can fish that specific area." In every alternate site they tried, people stole their fish or destroyed their net. Consequently, they abandoned their stationary net harvesting to rely on boat fishing.

Occasionally in the past, Bert was hired by fishpond operators to repair dikes at a small daily wage. Until he had an accident in 2001, he gathered small wild fish to sell to the fishpond operators. Most days, husband and wife fish together between 4:00 and 7:00 A.M., throwing their small net twice from their wood boat. (Note that the wife engages in seven hours of seafood harvesting compared to three by the husband.) She recalls that their typical catch in the 1970s was about 15 to 20 kilos of assorted crabs, fish, and shrimp. Since the early 1980s, their catch has fallen sharply, and they no longer capture crustaceans or

high-value finfish. These days, they typically catch only a small bowlful. Thus the household diet consists primarily of oysters and corn, supplemented occasionally by small fish. Manang purchases corn because it costs only 63 percent as much as rice. When we interviewed this couple, both corn and rice were more expensive in the Philippines than in the United States. She cultivates sugar cane and yams in her garden without any artificial inputs, but she does not grow vegetables that require expensive fertilizer or pesticide.

1.2 *Export Production Other Than Fishing*

The second element of the labor portfolio of Panguil Bay fisher households consists of forms of export production other than fishing. There are few export activities in which Panguil Bay fisher households can afford to be involved. As we saw in Chapter 3, some regional peasant households manage fish farms for absentee leaseholders or engage in aquaculture on shares with investors. However, far more Panguil Bay women are engaged in shell production for export. Nationwide in 1977, ornamental shells and shellcraft articles accounted for nearly 21 percent of the total value of all fishery export. Since the mid-1990s, regional women have collected shells throughout the year to sell them annually to a regional trader. In 2004, this female export had dropped in economic significance, but it was still the tenth most important fishery export commodity. Since the mid-1990s, fisherwomen's shells accounted for 3 percent of the total volume of fishery exports, and their 2004 outputs were valued at $1,130,127 (Philippine Annual Fisheries Profile 1977, 1995, 2004).

In two Panguil Bay municipalities, the primary export production of middle-sector fishing households is seaweed farming. While fishing agencies and NGOs herald seaweed farming as an alternative livelihood to capture fishing, it is a risky occupation for the majority of peasant households because there are many problems that threaten outputs. Small farmers must have an alternative way to earn income while waiting for harvests or when seaweed production is low. Since the growing period is two to three months, "seaweed needs a backup," insists one producer. For that reason, these peasant households rely on fishing to insure daily food. "Where there is seaweed, there are lots of fish. We just go to seaweed and catch fish there," comments a seaweed wife. A mid-sized seaweed grower indicates that "people still fish for daily household use." The most popular method is hook and line fishing while they attend the seaweed. In addition, they gather the small crustaceans that attach themselves to the bamboo poles, providing another protein resource. Many middle-sector peasants combine seaweed farming with stationary net fishing, so they have daily catches for both selling and consumption. Using a hook and line, one small seaweed/fisher often catches fish to purchase household rice.

In order to afford rice or corn, he sells the fish in the public market, marketing more than he holds back for family consumption. One small grower defines fishing as the only method to insure daily purchases of grains and essentials like salt. "Every day we can only eat if we work hard at fishing. Every day rice must be bought. But seaweed cannot be gathered daily."

When production is normal for small growers, one sack of green seaweed can provide the family's rice and salt for a week. Protein is not part of the household cash budget since they catch fish in the seaweed gardens. While most of these families often do not have enough income to supply their basic survival needs, they must "allot an additional line's growth" to support a child's schooling. Seaweed farming provides an unstable and erratic income, so households must have a diverse livelihood portfolio. Consequently, they pool resources from as many forms of labor as possible, including: fishing, waged labor, livestock raising, limited informal sector activities, cash contributions from children, and supplements from networks of family and friends.

After her husband died, fifty-five-year-old Nang Cora migrated from another island to Panguil Bay because she was enticed by popular claims that seaweed farming offers a better livelihood than fishing. She brought with her two children in their twenties. These adult offspring attended only a few years of elementary school because they worked from a young age to help sustain the family. Three adults and one child live in a rented one-room shack that has access to untreated public water spigots, no electricity, and "no toilet but the seas." To build savings to enter seaweed farming, she prepared and sold barbecued bananas in the public market. After about a year, she purchased two lines in the shallows for $36.36. The second year she was able to increase the number of lines to ten and to hire a laborer to pound the bamboo base into the sea floor. In addition, she invested $63.63 in a non-motorized boat.

In the first eighteen months, she averaged $90.90 monthly, or an average of about $3.30 daily, so she thought her investments had been well-made. In the early months, both her adult children helped with daily seaweed maintenance, then she and the daughter took over the responsibilities. On those days, Nang Cora began her days at 4:00 A.M. with the preparation of small strings to tie the seaweed plants to the lines. Typically, they worked six or seven hours daily in the seaweed, starting early enough to be done by mid-afternoon when the heat became unbearable. As it was their only livelihood, they harvested every month, unlike the bigger gardens where they wait two to three months to insure peak production. When her lines in the shallows stopped producing due to pollution and disease, the family fell upon hard times. At this point, Nang Cora did not have a cash-earning backup. She was afraid to risk limited household capital to return to street food selling because the prices of bananas, sugar

and margarine had risen too high. "How can you make profit," she inquires, "when commodities cost so much? Who is crazy enough to buy such an expensive barbequed banana?" By her third year of seaweed farming, she had lost all her accumulated savings due to "failed production," and her "debt was piling up." At first, she borrowed seedlings from other seaweed farmers, but she no longer tends the unproductive shallows garden. "When seaweed is fine, we are also fine. But if seaweed is not okay, we are not okay," she explains, demonstrating that she knows that her household does not have a sufficiently diversified labor portfolio to provide their needs.

Excluding debt repayment, this household needs cash to pay rent and to buy rice, salt, and charcoal for cooking, but they are only bringing in 20 cents per capita daily. The daughter located a waged job as a domestic servant at less than $1 daily, but her adult son does not help with household income. He erratically tends fighting cocks for an affluent man, but he only earns a small percentage of the owner's erratic gambling wins. Since the cock typically loses, he contributes nothing to the household and is dependent on his mother for his daily sustenance. The seven-year-old granddaughter has never attended school because the household cannot afford the school fees. Moreover, her small earnings are needed. By picking up seaweed that has washed onto the shores and by guarding pedicabs for one peso while the drivers rest, the girl contributes more income to the household than her uncle. The grandmother stretches three kilos of rice or corn over three days, the family rarely having sufficient protein. While she hopes that somehow her seaweed production will improve, she recognizes that their situation is precarious. "I must run fast and work hard to catch the rice and something to eat with it," she told us.

1.3 *Paid Labors in Putting Out Systems Other Than Fishing*

The third element of the labor portfolio of Panguil Bay fisher households consists of forms of paid labors in putting out systems other than fishing. Investors are quite creative in their development of putting out methods to capture peasant labor at minimal cost. In the 1980s and 1990s, there was some export handicraft contract work among Panguil Bay households, but fisherwomen report that these piecework opportunities have disappeared due to national economic conditions.[4] A new seaweed putting out system has emerged. In one community, local investors provide technology that permits young male divers to produce seaweed on shares. One wife reported that her teenaged son "dives to collect seaweed from the ocean floor, with the backing of a financier who

4 Vasquez (1989), Pineda-Ofreneo (1990) and Illo and Pineda-Ofreneo (2002) describe home-based industrial production by rural Philippine households.

takes most of the revenue from sales." According to one seaweed grower, "this is a very lucrative way to collect seaweed. Harvesters scavenge plants that have dropped to the sea floor. It only takes about one hour under water to gather 300 kilos or more."

However, the putting out system that absorbs more fisher households than any other activity is palm frond thatching. The primary consumers of woven palm are rural households who need cheap materials to construct the roofs and walls of their huts. In Bay communities that still have sufficient mangroves, at least one-third of the households earn income from this craft. When mangroves are controlled by fishponds, households eke out a living by paying bribes or rent-shares to harvest palm tree branches. Dominated by women, thatching palm fronds is a labor intensive process to which a few males provide support roles. This back-breaking job consists of tedious tasks repeated all day in a sitting position, six days a week. Females work eight to ten hours daily thatching the fronds, but additional unpaid work must be done at home to prepare for each day's piecework. Girls begin to learn at age five and can thatch proficiently by age ten or eleven.

FIGURE 26 Because most peasant fishing households rely on canals for bathing and washing clothes, there is a higher incidence of schistosomiasis in the Panguil Bay provinces than in the rest of the country. Many peasant households keep boats in or near canals because they are their only access to coastal waters

On average, an experienced palm thatcher produces enough to earn $2.50 to $4.75 weekly for her piece production. However, women rarely collect in any week the true value of their labor, for they frequently draw household advances from buyers against future production. Since this livelihood provides the family's staple grain, it is at the heart of household survival. However, palm thatching is a livelihood that is vulnerable to ecological changes, to restrictive fishpond practices and to public fishery policies. These thatchers have two concerns about the future. First, floods threaten this livelihood. Thatchers "cannot work because nobody can harvest palm in the mangroves. The floods often destroy trees and wash away stored thatching supplies." Second, thatchers are worried that palm harvesting might be prohibited in the future, as part of conservation efforts.

Struggling to raise eight children on 22 cents per capita daily, Vera and Jose manage a household that is dependent upon her capacity to be a productive palm thatcher every day. After an economic downturn caused them to lose their sharecropping parcel, they migrated from an upland agricultural section of the country. They are among the poorest households along Panguil Bay. Inexperienced in fishing, Jose cannot afford to acquire a boat or equipment. As a newcomer, he lacks ties to men with whom he might fish on shares. In the hope of eluding fishery officers, Jose leaves the house before sunrise to try to electrocute fish with his *pangoryente* (a car battery attached to two long rods) in irrigation ditches and rice fields. Jose's livelihood is illegal, but this is the only technology they can afford. "If Jose gets caught," Vera explains, "our pots will be upside down," i.e., they depend on his fishing to supply the daily protein in their cooking pots. It is a dangerous method, she says, because the fisher might get electrocuted while he is standing in the water. He is also at high risk of contracting schistosomiasis because he spends so much time in infested water. He often does not catch enough fish to provide food for his household, so he almost never markets any.

Six people live in Jose's household in a one-room woven palm hut, with no electricity, and an outdoor pit toilet. They bathe, swim, and wash clothes and dishes in an earthen irrigation canal where they are exposed to chemical pollutants and the risk of schistosomiasis. Vera is eight months pregnant, and she has had nine pregnancies in eighteen years. Though she tried birth control pills several times, she always had to stop taking them when they triggered breathing difficulties. Vera attended school only to the fourth grade, and her children are not likely to have much better chance at acquiring an education than she experienced. Elementary school is too expensive for them because "the teacher is always asking for a contribution." Her seven-year-old daughter has already dropped out of the first grade because a flood washed away the

bridge, causing her to be absent and fall behind. Vera is thankful that she did not return to school because she will need her help at home when the new baby comes.

Like her husband, Vera begins her work day at 4:00 A.M. Using wood gathered from the mangrove, she boils corn grits every morning she has them. While the children are still asleep, she prepares vine to tie the day's woven palm, an unpaid task she must undertake as often as possible if she hopes to keep her production as high as her household needs. By 7:00 A.M., Vera has fed her children and is off to the buyer's site to thatch palm fronds until dusk. The shifting of traditional gendered labor roles makes it possible for her to earn thatching income every day. After the husband returns from fishing, he tends the children, does some household chores and prepares meals. If he has fish to market, he arranges that himself. Turgo (2015) refers to such shifting roles as "fishermen-turned-house-husbands" and "disrupted masculinity" that can lead to rising tensions among spouses. However, James Eder (2006: 408) reports a shift in gender roles that more carefully captures what we saw in Vera's household.

> The presence of sexually jealous and domineering men in the rural Philippines is today thrown into relief by the simultaneous presence of far greater numbers of men who... share child care and domestic chores, for as the economic role of women has changed, so too has the domestic role of men. Nonetheless, men vary significantly in their willingness to take on domestic chores on a regular (and hence predictable) basis, and for most women their own responsibilities in this area remain an important constraint on their ability to propose and pursue income-earning activities outside the home.

The young daughter accompanies the mother to learn to thatch, so the ten-year old son feeds the mother's pigs and sometimes prepares the evening meal. Thatching is taking a physical toll on the pregnant mother. After a full day's work, her arms and hands "feel numb and will shake." During the work day, she rarely rises from her squatting position, so by day's end her "back is terribly painful." Before sleep every night, Vera must use her numb hands to prepare vine to be ready for the next day's work. Day-to-day provision of the family food supply is Vera's foremost worry. If there is fish, it is a "very lucky day." Yesterday, Jose was fortunate enough to electrocute three kilos, most of which he sold for less than $2, holding back two small fish for the family. That was sufficient for only one meal, so yesterday's lunch was a cooked tough banana. For today's breakfast, she had to thin the food to have enough for all the children.

"I put more water into the cooked corngrits," smiles Vera nervously. Interviewees often smiled or laughed when reporting negative or stressful information. Smiling or laughing in such a context is not intended to trivialize events but, rather, is a common Filipino coping mechanism. The typical breakfast is boiled salted corn grits, and she will leave the remains for the three youngsters to eat during the day. "Today, all I left for the children is cooked corngrits. If my

FIGURE 27 Many fisher wives spend two or three hours daily bent over rocks during low tide to gather oysters (top). Then they must spend an equivalent amount of time using a heavy iron blade to force open the shells to remove the meat (bottom). Oysters are a women's market commodity, so peasant households consume few of the captured iron-rich molluscs

husband has a catch, they can have fish for lunch." Since such daily protein is rare, the two-year old boy is so malnourished that he participates in a public community feeding program.

This household would have even fewer food resources without Vera's palm thatching. Each day, she asks for an advance of corngrits against her weekly production. She budgets one kilo of corn grits each meal for two adults and four children, but that is rarely enough. They cannot plant vegetables because of frequent flooding and destructive stray animals. Because both humans and loose cows devour wild bananas, Vera's son is able to collect little of this wild food resource. To complicate matters, the family does not gather the nutritious wild green vegetables that abound in the rice fields because she fears they will contract schistosomiasis from them. After a flood drowned their sixteen chicks, Vera decided not to butcher their remaining hen or consume its eggs. "We must take extra care with this one remaining chicken. Much as we want to eat the eggs, especially the children, we cannot. We have to raise new chicks." An attempt to raise pigs on shares failed miserably. After purchasing feeds for nine piglets over four months, they died, and Vera "lost big." If the animals had survived, they would have 4.5 piglets to supplement household survival needs. Instead, they just "returned the sow back to the owner," having lost their monetary investment.

1.4 *Informal Sector Marketing*

The fourth element of the labor portfolio of Panguil Bay fisher households is informal sector marketing. Throughout Asia, the informal sector is expanding, and the vast majority of households draw income from these activities (United Nations 2003). As a direct result of neoliberal policies, the informal sector has exploded in poor countries, creating "a surplus population working in unskilled, unprotected and low-wage informal service industries and trade." Since 2000, the informal sector has created half to two-thirds of the new jobs in Asia, and women are over-represented in these activities (ILO 2007). In the Philippines, there are more men than women in the informal sector, but females are more likely to earn informal income than formal-sector wages (United Nations 2003). Moreover, women's informal sector activities become the mainstay of households when male fishing or wage earning declines suddenly. While these coping strategies provide little income to most households, informal sector activities multiply women's labors, generating a "female double burden" of market labors and household maintenance (Illo 1997: 36). For men to be able to cling to fishing, household survival requires several breadwinners who have multiple sources of income and resources. In fact, as much as 60 percent of income derives from nonfishing activities that are undertaken by women and children (Interviews).

When there are young children in her household, a fisherwife is deterred from seeking formal wages or all-day piecework, but she can "multi-task" informal sector production and marketing alongside household duties. Among the poorest families, female income from informal sector production and marketing is very significant to the household budgets. Women sell cooked foods, medicinal herbs, fresh produce, livestock, chickens, coconut shell crafts, hats, baskets, crafted lanterns, pottery, mats, and several other items in public markets (or by peddling) near their homes. After harvests in adjacent areas, some wives and children collect and sell crop rejects, such as mangoes. Some engage in crude coconut oil processing for the Ozamiz City soap factory. Females also operate *"sari-sari"* stores, very small neighborhood retail shops that offer a small array of goods at inflated prices. For example, they sell cigarettes one at a time or as little as a tablespoon of cooking oil. Customers purchase small refurbished or crafted household items, bread, coffee, snacks, soft drinks, sometimes used western clothing. Out of their homes, some females provide seamstress, embroidery or tailoring services, sell cosmetics or operate beauty shops. A declining number of women are fish traders in public markets.

Women salt, dry, or smoke about half of the municipal catch of smaller fish for local selling (Philippine Annual Fisheries Profile 2008). Some wives process dried fish to be sold to brokers who market it all over the country. Almost all females (and a few older men) engage in oyster gathering, one of the most important income-generating activities. Since the 1990s, some Philippine women have been engaged in oyster and mussel farming (Siar et al. 1995), but we did not find female oyster farmers in the Panguil Bay area. Fishpond operators and male fishers are attuned to high tides that will permit flushing of shrimp farms or bring in the fish that can be captured. In contrast, oyster gatherers organize their work around low tides when mangrove floors are exposed, and the mudflats will sparkle with these mollusks. On average, a gatherer will produce about three cups of oyster meat daily, part of which will be marketed fresh for 18 cents per cup. To acquire twice the cash return of the raw mollusks, many women process oysters to sell to a trader at 32 cents per bottle. In addition, women save the oyster shells and pack them in sacks to await the December arrival of a buyer. Each labor intensive sack is sold for 36 to 72 cents to be pulverized into fertilizer.

"Whatever I can think of to make money, I do," one fisherman told us. Males sell fuelwood and charcoal, collect wild fry to sell to fishponds, sell crops or livestock from share farming, produce and sell coconut wine, or sell short-term blacksmithing, carpentry, or construction services. Males can drive pedicabs if their households can afford to invest in the equipment. Children are an important source of resources and income for fisher households. Young children beg,

FIGURE 28 Female production of roof thatching. This pregnant wife (top) thatches nipa eight hours daily, sitting in the same cramped position continually except for brief breaks. This seven-year old girl (bottom) is already proficient at thatching, so she no longer attends school. Her household relies on daily advances of corn, sometimes small amounts of cash, against future nipa production

do odd jobs on the streets like shining shoes, gather trashed plastic bottles to sell to seaweed growers to use for floaters, or earn daily income doing tasks at the seaweed cooperative. Children also gather seaweed that washes up on the shores, dry and sell them.

A few fisher households resort to criminal activities to provide household food and income. In addition to illegal fishing with dynamite and electrocution, some males engage in seaweed theft (JEP-ATRE 2004). Small growers are convinced that seaweed is stolen because it brings easy cash at the public market, especially when there is a shortage of supply for local consumption. Thieves "will steal the seaweed, dry them and sell them," in order to buy their household food for the day. Larger planters contend that new poor farmers steal seaweed for seedlings. According to a local government official, "Newcomers need capital and don't have enough to buy ropes or seedlings. We stopped our seaweed farming for seven years because of thefts. The seaweed stealing sometimes resulted in violent encounters, so we stopped growing it."

Just as export of fish and seaweed integrates Panguil Bay's small peasant producers into globalized food chains, world-wide commodity chains of smuggled drugs absorb some of them into another exploitative capitalist venture over which they have no control. At the same time in the 1980s that external Asian investors were attracted to shrimp aquaculture in the Philippines, "Hong-Kong based syndicates with strong connections with Filipino-Chinese counterparts" established the international drug trade in the country. Northern Mindanao exports each year significant amounts of marijuana, crystalline methamphetamine and heroin (Philippine Center on Transnational Crime 2000). Philippine media and government agencies regularly document Ozamiz City's "rising illegal drug trade" and its high incidence of drug abuse and dependency. One media account describes Ozamiz City as "a factory of shabu." One study of the roles of children and teenagers in Philippine drug trafficking points to two salient trends, First, arrested teenagers consistently report that some municipal and community officials are involved in the trade. Second, most of the children have left school due to family financial constraints (*Manila Times*, 27 March 2004).

1.5 *Wage Earning*

The fifth, and least significant, element of the labor portfolio of Panguil Bay fisher households is wage earning. We are exploring wage earning as the last element of a fisher labor portfolio for two reasons. As indicated earlier, export activities have generated few wage jobs in or near fishing communities, and those waged positions are under-paid and often short-term. Second, these households accumulate very little of their total survival needs from wages, and they move into and out of waged positions frequently. Only about one-third of male fishers earn wages from nonfishing livelihoods, and most of these earnings are from part-time jobs. Males occasionally work for wages planting or harvesting for larger seaweed planters. Some find erratic or seasonal employment

in the city's small businesses, operating pedicabs or working as wharf porters or warehouse laborers. Some earn wages for washing clothes in middle-class households. In the past, a few women earned wages from fish canneries, but these rural facilities now rely on piece-rate workers, who hope to be selected from the hundreds who gather every day at the factory gates (*Strait Times*, 10 September 2007).

More than one-quarter of Panguil Bay children earn wages while many more assist parents with farming, fishing or informal sector activities. Because of the high incidence of poverty, children in Bay fisher households are more likely to work as child laborers than is true for the rest of the country.[5] Some teenage sons find rare waged employment as store helpers or as warehouse laborers. If very lucky, they might earn $5.40 a month for tending newly planted mangoes. Rarely, a younger child is hired as a part-time farm laborer at 18 to 54 cents daily. Daughters can work as salesgirls or as domestic servants in urban areas.

Households that become dependent on wages are highly vulnerable because the earnings are never enough to cover more than a small proportion of survival needs. The following case study demonstrates that women's income earning and resource gathering are crucial to households in which males provide only low and erratic wages. Since 1963, the extended families of Nina (aged 51) and Rene (aged 60) have been dependent on fishpond laborer wages. "We started working in the fishpond when we were little," Nina explained. "My father and my husband's father both worked in the fishpond. Also their respective families." For most of their married life, this couple has also relied on fishpond wages. However, Rene's wages and supplementary resources have declined sharply over the last three decades. In 1963, he was paid daily, and he received benefits that are no longer available to the household. He recalled that "goods and food were then very cheap. Worker households all lived inside the fishpond, built our houses on [corporate] land and used the edges of the ponds to grow yams and a few vegetables. We were allowed to use hook and line in the fishpond to catch unwanted fish that were among the shrimp. After workers had sorted the shrimp harvest, we were given the rejects that were too small to be sold." Before the fishpond was flushed after harvest, the fishpond management hoisted a white flag to alert the community that they could come and glean the fish left in the water. Throngs of people flocked to the fishponds bringing sacks, baskets and buckets. The corporation ended this practice in the early 1980s when the fishpond management "realized these fish were profitable for export, so they no longer would give them free to the community."

5 Analysis of regional and provincial data, Quickstat.

Rene worked as a crane operator in the fishpond, earning $65.45 monthly, about $2.18 daily. A ten-year old son helped in the fishpond at less than one cent per hour. His employer required him to "work six days a week. Sometimes, he would work twelve hours or longer with no overtime pay." During harvests, Rene overworked and did not take time off for bronchitis, fearing he might be terminated due to disability. Consequently, he developed pneumonia, the number one cause of death in the Philippines. As his health worsened, his wages and supplementary benefits declined, forcing Nina to intensify her self-exploitation. Her husband's fishpond income was "never enough," she explained, "and we were often short." Thus income from her palm thatching was quite often "bigger than her husband's wages," so it became more crucial to household survival than his wages. In those days, she said, "I could hold real money!" Because she cut palm fronds inside the mangroves of the fishpond, Nina had to "pay the management 50 percent of whatever revenues" she derived from her sales, but she still netted more than his wages. Her husband grew increasingly concerned that she had to do the back-breaking palm cutting in the hot sun. Even with his low and erratic fishpond wages, "we were not in bad shape because I worked so hard," Nina is convinced.

Rene left his long-term job for what he thought would be a better-paying position at another fishpond. They moved away from the place where they grew up and spent most of their married lives. They "did not have much money to start a new life" because they had to settle their debts with the previous fishpond operator. Nina doubts this new job is a positive change because the employer is stricter about absences and makes more wage deductions. They live in a dilapidated one-room woven palm hut that is much worse than their previous dwelling. It has no toilet, no electricity, no access to safe water, and is "always reached by the flood waters" that carry debris and dangerous cobras. When they lived inside the previous fishpond, she could plant yams along the dikes, but the household does not have such gardening privileges with the new employer.

The worst disadvantage, however, is that the fishpond operator requires his employees to purchase their survival needs through an exploitative "company store" arrangement with a merchant outside the fishpond. Since their household purchases are deducted from his wages, they are trapped in debt bondage. To complicate matters, the couple doubts that he is being paid his full wages. Nina is concerned that she has "not seen any real money from his fishpond wages. Often, the wages are not even enough to pay for our advances in the store." As long as he is not sick, all is well. We can eat, we can live simple lives. But when he gets sick, it is a big problem. And I have to find a way to make up the missing money." They are nearing retirement age, so Nina worries that

their future will be as problematic as her parents' older years. Even though the fishpond owner failed to file her father's Social Security payments, the government never took any action. "We were so surprised that the government office had no record of my father's social security remittances because the company always deducted the premiums from his wages." Because there is uncertainty about her husband's wages, she suspects the new employer is not filing his social security payments.

> I think what we suffered in the fishpond is shared by all the workers. We bear all the hardship so that we will be eligible for the old-age pension. Our only consolation is the thought of a government pension when we get older. It is small but is sure money every month. When we get older, we cannot depend on our children. Maybe they can help us with food but not money. So we deem it important to work for the pension. That is the major reason we stuck it out with fishpond waged work.

Nina is ambivalent about whether her own situation has improved. On the one hand, she can no longer garden like she did at the previous fishpond, so they are forced to charge foods against his wages. On the other hand, the working conditions of her palm thatching are somewhat improved. While her total work hours are the same, the working conditions are better. Nina planted new trees and gathers palm from the parcel assigned to her under the Mangrove Stewardship Program. To accumulate more income, however, she illegally rents 1.3 hectares to a logger.[6] "Before I had to be under the sun to gather and trim palm fronds. Now I don't have to expose myself to so much heat. I love to cut palm, so I don't mind doing it. But not under the scorching heat of the sun."

2 Inequitable Management of Scarce Labor Time

As we have seen, most adults and many children are engaged in several types of work that comprise the portfolio of diverse paid and unpaid labors that will generate the household survival pool. Consequently, the second survival mechanism that Panguil Bay fisher households employ is management of scarce labor time to support their diverse labor portfolios. However, the workload is not distributed equitably. Philippine fisher households employ two strategies

6 Logging is illegal on their parcel. See Chapter 5 for analysis of failures of this conservation program and of widespread illegal uses of steward parcels.

of work time allocation: (a) adherence to an ideology of self-exploitation and (b) inequitable allocation of work among members.

2.1 *Self-exploitation by Household Members*

During crises or shortfalls in basic needs, households have few options for broadening their resource pools. Consequently, they deepen self-exploitation by working longer hours, sleeping less and expanding the number of family laborers. Two strategies predominate among Panguil Bay fisher households: working longer hours and taking children out of school. As one Philippine fisherman observed, "it is solely your body that earns a living. If you rest, you will have nothing to eat." The exigencies of survival necessitate a pattern of *self-exploitation* in which households take on multiple forms of resource accumulation, and adults almost always have a diversified labor burden that combines household activities with cash-earning. "You can eat only if you work hard!" is a theme voiced over and over. One Philippine fisher indicated that he "looks for food and work wherever he can find it," and he "constantly worries" about how

FIGURE 29 Women's paid and unpaid household labors. In this photograph are displayed several forms of unpaid and paid women's work. To provide household protein and informal sector goods, she raises chickens and gathers oysters. She bottles oysters and collects their shells (piled mid-ground behind net) for selling to regional traders. Behind her is one of her husband's fishing nets that she is currently mending. Early this morning, she washed the family's clothing (top right) in buckets outside the house

he will "keep his family from going hungry." To provide household basic needs, however, it is the wives who most frequently juggle a multi-activity work portfolio in order to have a security net.

Most fisherwives live most of their married lives with men who cannot support their households through their fishing or their wages in fish farming. In reality, the daily unpaid and paid labors of these women far exceeds the total workload of their husbands. It is important to emphasize that these women assume the added workloads because the household budgets they manage are insufficient. In short, wives self-exploit to a greater degree than husbands in many of these households. While women take on the burden of double or triple work days, males do not typically match the level of female contributions through the same degree of self-exploitation (Illo and Polo 1990). During crises, households most often expand their resource pool through an intensified work load for women and children. In order to accommodate these new extra-household labors, women lengthen their work days in order to articulate their income-earning labors with conflicting household chores, provisioning, and gathering activities. During men's fishing off-season and when male catches decline, women seek out new alternatives to earn income or to secure resources. *On average, women generate half or more of total fisher household income*. However, many of the interviewed women account for a majority of the cash income during much of the year, especially in those households in which husbands are trapped in debt bondage relationships with traders or financiers. In the early 21st century, fisherwomen women bring in a greater share of household cash income than they did in the 1980s and 1990s.[7]

Fisherwives also self-exploit by taking sole responsibility for work to generate school expenses. For example, one interviewed fisher household needs $1.40 daily to cover basic survival needs and the costs of sending three children to high school. The wife celebrates when her daily harvest of oysters is enough for household consumption and a surplus that will cover the cost of her children's transportation to school. "Most of our cash needs and school expenses are derived from the oyster gathering and selling," she asserts. In addition to her oyster income, she often raises pigs on half shares with the owners, as a means of accumulating the funds to meet educational costs. "There are a lot of expenses for school," the mother frets, "so I save on household expenses however I can." She walks to church rather than pay for public transportation, and the earthen kitchen floor has not been covered with bamboo or wood. The children carry their lunches to school, herbal medicines are used for health

7 Quezon-King and Evenson (1983) and Torres (1995) indicate that women accounted for about 40 percent of total fisher household resources in the 1980s and 1990s.

problems, and she forgoes electricity in the house. She also budgets house repairs and maintenance gradually in order to keep the needed cash flow to cover school expenses. So far they have been able to keep their children in high school while a majority of their neighbors do not. Many fisher parents were taken out of school themselves during household crises, and they, in turn, remove their offspring from school when income drops too low.

2.2 *Inequitable Work Time Allocation*

Households manage their diverse labor portfolios through inequitable allocation of work to members. What was new under historical capitalism was "a steady devaluation" of the work of householders and "a corresponding valorization of waged labor" (Wallerstein 1983: 24–25). However, waged laborers contribute less total work toward household survival than their nonwaged peers. Throughout Asia, women work more total hours than men, and wives allocate far more time to household chores than husbands (United Nations 2003; UNICEF 2007: 37–38). In addition, daughters do more of the unpaid household labor than sons. Even when wives in poor countries provide significant income to their households, their contributions do not afford them enough leverage to convince males to assist with domestic work. Women's capacity to maneuver their conflicting workload is very limited. They can mobilize claims to other female labor, but women are rarely able to significantly diminish their own workloads by having husbands expand their share of domestic work (Beneria and Roldan 1987: 146).

Similar work time inequalities are evident in the Philippines. Throughout the 1980s and 1990s, several national analyses reported wide gender inequalities in work time allocation in which females experienced a "double work day." According to one Philippine feminist,

> the amount of time devoted to relatively fixed economic and social responsibilities was more than doubled when the demands of housework and family were added to the time spent at paid work. Yet husbands were not inclined to do their share. ... And when husbands did perform chores, they were the more peripheral activities; the wife remained responsible for the core of household obligations. (Eviota 1985: 203)

Several studies indicated that inequalities were probably wider in rural areas where husbands provided only about one-third as much time to unpaid household labor as their wives. Rural men also contributed less time than women to household market activities and to informal sector marketing. According to the 1999 Philippine Human Development Report, there is "a

tendency toward 'overworked' rural females and 'underworked' males," especially since men average two hours daily leisure that are not available to women. Rural women respond to household economic shortfalls by increasing their work hours to a greater degree than men (Lim 2000). In 2005, the Philippine National Statistical Coordination Board estimated that women provide nearly 60 percent of all unpaid household labor. If the GDP incorporated the real economic value of unpaid labors, women's work would add nearly 40 percent while men would add less than 27 percent (Encarnacion 2007).

In the 1980s and 1990s, studies emphasized that, unlike their husbands, women rarely engaged in personal leisure activities, preferring instead to allocate those hours toward income-generating labors. To maximize time utilization, these wives "multi-tasked" by merging their household tasks, such as child care, with cash-earning work near their homes (Ardales 1981). In fisher households, women provided three times more hours to unpaid household labors than men, and husbands completed only one-fifth of the labor hours toward reproductive tasks, caregiving and household maintenance (Pineda-Ofreneo 1985). Indeed, scholars reported that wives cross boundaries between reproductive and productive tasks to a far greater degree than their husbands (Lachicha 1993). Moreover, women were expected to assume part of the male workload, but husbands did not widen their completion of household tasks (Israel-Sobritchea 1993). While about a third of men helped regularly with household tasks, a majority of women took on part of the fishing-related tasks (Pineda-Ofreneo 1985). One wife described these inequalities as never ending. "Women work day and night. When men finish their work outside, they can rest sometimes. But women come home from their work outside of the home and do most of the house chores and care for their children." She also argued that males are healthier because their wives work harder (Kwiatkowski 1998: 87, 282). According to Mabunay (1995: 353), men "prefer to spend time finding recreation outside. Thus the situation has not changed the amount of time spent by the men outside the home. The men in the community go about their usual routine of staying out of the house and leaving their women to do all household chores."

In reaction to their husbands' fishing schedules, women must reallocate their labor time to different tasks across seasons, and they shift income-earning roles throughout the year to accommodate their labor time conflicts in ways that men do not (Dessing 2002). During off- seasons or when weather prevents fishing, most husbands do not apply their freed time toward household labors. In Panguil Bay fisher households, wives provide slightly more of total household income-earning labor than husbands, but they also contribute more than 60 percent of total unpaid household work. Moreover, children

provide about the same amount of time to unpaid household work as their fathers. In comparison to earlier studies, however, fisherwives account for a higher proportion of income-generating work time than men. We did observe, however, that some younger males are assuming more child care responsibility in those households in which females were engaged in all-day income earning activity away from home.[8]

3 Arrangement of Household Credit

Since their diverse labors rarely generate enough household resources, the third survival mechanism is arrangement of household credit, a responsibility that falls primarily on women. In the mid-1980s, the Union of Philippine Peasants called for agrarian reform to abolish exploitative usury, emphasizing the need for "lower interest rates both from formal and informal sources of credit" (Schirmer and Shalom 1997: 388). Fewer than 10 percent of peasant fishers have access to credit through lending institutions (ADB 1999). Even though the national Family Code gives females the legal right to apply for credit without the husband's permission (Chant and McIlwaine 1995), only a tiny percentage of fisherwives are able to arrange household credit through formal lending institutions. Nonprofit fisher cooperatives are one possible source of loans, but households are not eligible for loans until they accumulate a set level of savings. Since most women do not have sufficient household income to divert into savings, this requirement makes it impossible for most peasants to acquire this type of microfinance.

As a result of the lack of formal credit, a majority of interviewed women routinely seek small loans from informal sources. Nearly 60 percent of their loans come from relatives, another 20 percent from friends and neighbors. When relatives operate sari-sari stores, they are able to secure items on credit from them. Typically, these small short-term amounts do not involve interest. Women primarily seek credit for household consumption needs, medical expenses and school fees. Women also use pawning as an approach to acquire credit, e.g., they will pawn a pig or a household item as collateral against a loan from a neighbor. Only about 10 percent of interviewed women secured credit

8 Work time was estimated using interview data and field observations. Spouses were asked to estimate work hours over a one-month period during men's active fishing season. Unpaid household labors include reproductive tasks, household maintenance, care giving, resource gathering for consumption, credit arrangements, resource budgeting and allocation, and inter-household networking.

from small fish traders, primarily because so few of them continue to market husbands' catches. Moreover, wives maintain household credit separate from their husbands' indebtedness to traders who finance fishing operations. When they borrow from fish traders, their daily credit becomes a revolving door of exchanging the fish catch for food advances, primarily rice. When credit is extended by shopkeepers or moneylenders, the interest rates can be prohibitive. According to one wife, "the interest doubles every time we fail to pay our debt, and they often force us to 'reconstruct' the loan at a higher interest rate if we miss two payments."

4 Restructuring Household Boundaries

The fourth survival mechanism that Panguil Bay fishers employ is the reconfiguration of household membership and spatial boundaries. Over time, households are forced to alter their composition and internal dynamics to confront economic changes. Households are "redefined and reshaped as part of the pulling and tugging" associated with resource scarcities caused by capitalist incorporation of a geographical area, with the effects of the widening and deepening of export capitalism, or to adjust to the economic downturns of the world-economy (McGuire et al. 1986: 77–83; Smith and Wallerstein 1992: 19–21; Dunaway 1996: 23–48). In the face of growing immiseration caused by capitalist innovations, ecological degradation or cyclical economic upswings and downturns, households change their size and membership and expand their resource boundaries through inter-household networking.

4.1 *Changing Fisher Household Composition*

Nationally, fishing households have declined in size since 1990, and fewer households have enough resources to incorporate extended kin.[9] Fosterage is the primary strategy that fishing households employ to diminish their size during resource shortfalls. For example, Vera and Jose cannot afford to keep all their children with them, so their four teenaged boys live with relatives. Because they work for their room and board, these sons cannot contribute any funds to their parental household. Some Bay households must expand their boundaries to absorb elderly extended kin who can no longer support themselves. Bels' father stopped fishing nine years ago due to a type of chronic lung congestion that is typical among Philippines fishers, but he contributes

9 Analysis of national and regional data, Quickstat.

his small government retirement pension to the household. He has lived in his daughter's household more than a decade, able only to help with cooking and child care. The grandfather remembers with pride his past fishing days when ecological conditions were good enough for him to harvest six kilos daily with his wood canoe and hook and line. Unlike his son-in-law today, he did not worry about affording rice for his family. On the one hand, his catches were bountiful enough; on the other hand, rice was much cheaper. About fifteen years ago, he could earn twelve pesos per kilo for fish, but rice cost half that much. The elder fisher was able to send six children to elementary school and one to high school. Pondering that his son-in-law's average daily catch rarely reaches two kilos while the cost of living is escalating, the grandfather shakes his head in despair. "Fishing was good in the past," he laments. "Now, we cannot live through fishing any longer."

Labor migration is a third strategy through which household composition is altered. The Philippine state brokers the transnational migration of nearly one-fifth of the Philippine labor force to 186 countries (Rodriguez 2010). The laborer remittances flowing back into the country total nearly $8 billion annually and account for more than half the country's GDP (Escobar 2004). In 2002, one of every 48 workers in the formal labor force was employed abroad. In 2012, more than 12,000 Panguil Bay laborers were working abroad, a majority of them males employed on foreign ships.[10] In return for cash advances, some fisher households contract the labor of teenage sons to foreign ships (ILO 2020). Remittances from these transnational workers make fisher households less vulnerable to fluctuations in resources, but the absence of husbands intensifies the workload of wives. As more teenagers and young adults migrate to find distant jobs, Bay households draw part of their household income from regular remittances from those offspring. However, some fisher parents engage in "reverse remittances" when (a) they pay the educational expenses of migratory offspring but receive no economic return, or (b) they provide financial assistance to distant offspring who lose employment or cannot make ends meet (Agree et al. 2002).

4.2 *Inter-household Networking*

Asian households routinely construct survival networking systems that reach beyond their own confines, and they receive one-quarter to one-half of all resources and credit through these networks. In this way, "several households may form a reproductive system for one" (Meyers 1983: 277). Inter-household

10 Analysis of provincial data, Quickstat.

support is quite common among parents, siblings, and extended kin in Philippine fishing communities. "Through a bilateral network of consanguineal, affinal, and ritual kins, the mobilization of labor and other resources involves more than just one household. The support from affinal kins, particularly parents-in-law and members of one's own natal family, are a necessary ingredient for the reproduction and the firming up of material foundation of the households" (Illo and Polo 1990: 104). For example, some older parents supplement the household resources of their struggling married children by sharing food or by providing cash to help them establish informal sector earnings (Interviews).

Rural Philippine households cannot depend on local governments for anything other than water and some limited medical assistance. Consequently, inter-household networks are the survival strategy that fisherwives most often employ during resource shortfalls. In addition to outright gifts, these networks provide "quasi-credit," or flexible, informal loans with zero-interest (Fafchamps and Lund 2003). If there is not food for the day, "we have to ask from neighbors," reports a seaweed wife. "It's in sharing that we find solutions." Another woman indicates that it is common practice for friends and family to share food resources with adjacent households who are having a hard time. "Neighbors give us fish when we don't have any. When we have extra and they need some, we do the same." When one older fisher couple catches a large number of small fish that have little market value, the wife shares the surplus with three married children and needy neighbors. Some seaweed growers donate seedlings to small producers who cannot afford them. A privileged minority of households have family or friendship ties to fishpond operators who permit them to help in the harvests for a share of the rejected shrimp that fall below the standard export size. However, networking does not always bring needed resources, as one wife indicated. "When we don't have enough food, we go to our kin or to neighbors. Generally, they help, but many times they can't because they are facing the same problems we are. I also think the community is changing. A trend of self-preservation is setting in, so some neighbors don't help others." After her seaweed production failed, one indebted 55-year-old woman began to take her granddaughter to the shore when boats returned. There the child begs incoming fishers for a small part of their catch. "This really helps us," she says gratefully, but she knows this is an unreliable way to try to accumulate food for three adults and the child. Some days, the fishers do not catch enough for their own households, so they have none to spare her. On those days, she says, "we try to bear our difficulties."

Previous studies of Philippine fisher communities indicate that inter-household sharing of catches is not random. Family and neighbors primarily share

with those who have assisted them in the past. Surplus catches provide fishers the means to strengthen networks with people whose assistance their households will need in the future. However, this food giving is strategically managed like an investment. "Choices have to be made and limitations introduced so that [only] a select few, receive fish. ... Networking is selective and manipulative. ... To choose recipients of one's gifts implies that one has chosen to enter into a cycle of exchanges and therefore of rights and obligations with certain people." Among impoverished fishers facing the same threats to survival, networks are "always unstable shreds and patches of connective social tissue" because they depend upon the capacity of the parties in the network to provide resources when they are most needed (Dumont 1992: 177). In the wake of export targeting, declining catches and widespread food shortages, customary sharing of catch is less common. Moreover, many fishers have less control over their catches or their harvests from share ponds and stationary nets because they must deliver their outputs to traders or landings specified by those to whom they are indebted.

However, fishers and their wives continue to network in ways that do not involve fish catch sharing. Men lend tools, fishing gears or boats to relatives and selected friends. Two-thirds of interviewed women indicated they share food other than fish with relatives, friends and neighbors, and about half reported that they have received such help in the last few months. Mothers and mothers-in-law assist couples throughout the first year or two of setting up their new households, especially during pregnancies and child deliveries. When they are ill or during their child deliveries, women extend work assistance and other forms of help to relatives and friends. Among females who sell their husbands' catches, women will transact marketing activities for one another. Women routinely borrow small amounts of salt and cooking oil from one another, and they exchange children's clothing as their offspring reach different ages.

5 Inequitable Pooling and Allocation of Household Resources

The fifth survival mechanism that Panguil Bay fisher households employ is pooling and allocation of scarce resources. That fluid ongoing process involves unequal member contributions to household survival pools and inequitable intra-household allocation of accumulated resources. Because capitalism marginalizes a majority of Asian rural workers outside the wage labor force and remunerates men and women at differential levels (ILO 2007; UN 2003), Philippine fishing spouses are positioned to make unequal contributions to

household pools (e.g., Rutten 1982). Even though males are over-represented in waged jobs, women routinely provide an inequitable share of the total pool. However, women often downplay the worth of their contributions to show support for husbands whose livelihoods are being threatened. According to Michael Fabinyi (2007: 518), Philippine peasant fishing is

> both a livelihood and a practice that is connected to various ideas surrounding notions of masculinity. Although not an exclusively male affair, fishing itself is certainly dominated by men. ... If in reality the work of fishing may be shared between the sexes, the point remains that fishing is associated with an ideology of masculinity. ... Fishing is a gamble and an opportunity for fishermen to demonstrate their masculinity, economic prowess, and value.

Tensions between spouses have worsened in many households as males have been economically disempowered by declines in fish production. While female fish trading or other economic activities earn daily income, male fishing is more erratic, sometimes limited to a few trips weekly. As a result, male fishing earnings are often less than female earnings, especially when male fishers have debts to pay to traders or incur costly equipment repairs (Turgo 2015: 373). In these ways, the peasant fishing households mirror the gendered structural inequalities that sustain capitalism.

5.1 *Inequitable Distribution of Resources*

Rather than being egalitarian, the household is a capitalist structure in which conflicting interests lead to unequal pooling and access to resources (Rocha 1994). Because they reflect the capitalist valorization of income-earning labor (Wallerstein 1983: 24–25), households allocate an inequitable share of their resources to male income earners (Wilk 1989). Access to resources is determined by a household member's status in a hierarchical order based on gender, income-earning capacity, and age, with male earners at the top and mothers falling last (Young et al. 1981). Like the capitalist system itself, the household is grounded in patriarchal principles that lead to gendered inequalities in resource distribution (von Werlhof 1983, 1985). Like capitalists, some householders are so driven by self-interest that they exploit the altruism of others. Wage earners often behave in the household as though their monetary contributions are far more valuable than the back-breaking labor of others. They expect to be treated as though the wage (no matter how low) is enough to validate their demand for a greater share of household resources and a lesser share of unpaid household labor (Thomas 1990). Consequently, women and girls receive less than their fair

share of the total resource pool even though they contribute more labor power to household survival than males (Mies et al. 1988).

In a majority of Asian households, women and men prioritize provisioning in very different ways. Indeed, "husbands and wives differ in the definition of the basic necessities of the family complex, their consumption priorities, the way in which income should be distributed, and the proportion to be allocated for the common fund" (Beneria and Roldan 1987: 123). When resources are scarce, women generally prioritize the nutrition of family members. Thus income-earning women spend three-quarters of their funds on family food while men allocate less than one-quarter of their income to food. Moreover, increased female income leads to additional household spending on basic survival needs, but an increase in male income does not necessarily expand household food (UNICEF 2007: 26).

During crises, the inequitable allocation of household resources becomes most pronounced, but malnutrition and hunger are not spread evenly across all household members. In one-third to one-half of Asian households, parents go hungry in order to feed children, the mother experiencing the greatest degree of deprivation. In another one-third to one-half of households, there is an hierarchical order for resource allocation that is especially noticeable in differential access to protein. Even though they work more than household males, women consume less of the food pool. In times of shortage, income-earning males take precedence over nonproductive children, and the mother almost always receives the lowest allocation. Children do not receive an equitable share in relation to adult or teen males, but girls receive the lowest allocations of food. Despite mothers' sacrifices, the Global Hunger Index for Philippine children has remained serious since 2010 (Concern Worldwide 2010–2019), and one of every three rural Philippine youngsters is undernourished (FAO 2012a). Sick children receive the least food, followed by adults who are ill enough to be likely to die. With respect to the allocation of extra-household services that require monetary payments, households often engage in "selective neglect." Males are less likely than their wives to prioritize child health care, and income-earning males are more likely to receive health care than ill children, girls, or pregnant women. When resources are scarce, female fetuses are more frequently aborted while infanticide and selective neglect are most often directed toward girls (UNICEF 2007). In addition, poor Asian and Philippine households are more likely to invest in the education of boys. As a result, a vast majority of the world's illiterate adults are Asian females (United Nations 2003).

In similar fashion, gender inequalities in resource allocation are evident among Panguil Bay fisher families. A fisher household is "not a collectivity of mutually reciprocal interests." Instead, there is conflict

> over the distribution of income and consumption. ... The outcome is determined by who can exercise more purchase over the other, by appeals to tradition or to modern ways, by drawing in neighbors and relatives, and by the use of physical threats. ... The actual standard of living and availability of resources of any particular woman is decided not by household budget but by the way in which resources are allocated. (White 1993: 160)

Men and women set different priorities for the use of limited household income. While men tend to provide cash erratically for the household pool, women allocate everything they earn for household needs. Many men see little cash because they are trapped in debt bondage arrangements with traders or financiers, so they apply small surpluses to fishing equipment repairs (Interviews). Moreover, Philippine gender ideologies and laws have entrenched the notion that men have a right to personal spending money while women's income is for collective use (Feliciano 1994). The result is an inequitable pool in which men contribute less of their income toward household needs than do wives. In addition, many husbands demand funds from their wives' income when they lack pocket money (Interviews).

Through this inequitable pooling and other intra-household inequities, men receive far more than they contribute. That polarized pattern results largely because wives adhere to the familial ideology of *feminization of responsibility* for the needs of children. Vera's household helps us see these conceptual ideas in practice. Even though she is eight months pregnant, this wife still earns more from her palm thatching than her husband contributes to the household pool. She cannot sleep through most nights because she worries about what they will eat the next day and about *kawad-on* (literally translated "nothingness," i.e., doing without entirely). "If we only have enough corn left for cooking one meal, I cannot sleep anymore. Then I lose my appetite, and I don't eat. That is good though. The children can eat more," she says uneasily.

There are three sharp indicators of gender inequalities within Bay households. First, these parents reported that they were more likely to keep girls out of school and to allocate limited resources to education for their sons. One fisher mother of three girls and one boy told us, "I really want to give my son a high school education even if I have to eat nothing but salt and rice." Second, females are disproportionately impacted by ecological change (Mies and Shiva 2001). Destruction of mangrove trees and wildlife eliminates household resources that females gather for food and for income-earning. To wash clothing and gather mollusks, women wade into polluted waters filled with health risks while men primarily work in boats on the surface of these waters. Thus, females and children are inequitably threatened by water-borne diseases that

lead to death and lifetime health problems. Moreover, the chemical residues in Bay waters are greater health risks to females, especially those who are pregnant. Third, inequalities in allocation of food resources are evidenced in public statistics that make it clear that food shortfalls fall hardest upon mothers and children younger than five (WHO 2008, 2017). Over all, several nutritional deficiencies occur less frequently among males. Nationally, households allocate less iron to mothers and adolescent girls while fathers consume more than is needed. In rural households, the most malnourished member is the mother while most males receive more calories and more protein than the Recommended Daily Allowance (RDA). Thus women consume only 87 percent of the RDA of calories and only 79 percent of the RDA of protein (WHO 2008).

In Mindanao fishing communities during the 1980s and 1990s, intrahousehold food distribution discriminated against females while husbands consumed 101 percent of protein RDA (Tinker 1990). In contemporary Panguil Bay households, the harshest evidence of inequitable food allocation lies in the higher incidence of chronic malnutrition, nutritional deficiencies, and iron deficiency anemia among pregnant women and young children. As a result, the life expectancy of a Bay fisherwife is four years less than that of her husband, primarily due to chronic nutritional deficiencies over her lifespan.[11] In addition to higher mortality risks, mothers inequitably bear the psychological burden of hungry offspring. In the words of one mother, "it's torture when I have to listen to my four-year-old son cry when he is hungry. My husband's fish catches are so small, and rice is so expensive. I try to make do with what is available, but it is just not enough most days. It's hard. Sometimes I feel like my heart will break. My husband does not feel our [resource shortfalls] the way I do. I sacrifice for the sake of our child, but he won't." Mothers like this one often reported to us that they lowered their own intake in order to feed children, but we rarely heard such comments from men.

5.3 *Self Deprivation to Survive Household Shortfalls*

Unrealistically, interviewed males stressed the need to increase their fish catches as their primary survival strategy during household shortfalls. To accomplish increased catches, they worked longer hours, they traveled further and into deeper waters, and they employed more exploitative approaches, either by taking on additional debt to secure new technologies or through the use of illegal capture methods. Fisherwives pinpointed six strategies that they

11 Analysis of RSSIS (Module 7) and national and regional data, Quickstat.

employ during resource and income shortfalls. First, they broaden their provisioning workloads in order to reduce monetary costs through resource gathering. Second, they seek new income-earning sources. However, they must then balance the increased conflict between income-earning, household tasks and child care by multi-tasking and through personal reductions in sleep and leisure. Third, they adjust household diets by substituting cheaper, less nutritious foods and by relying on carbohydrates rather than more expensive protein sources. Thus the household rarely has fish or meat, and there will be inadequate levels of fruits and vegetables. Wives stretch food resources by eating two meals daily, by watering food, by recycling food that is about to spoil, and by lowering the intake of themselves and younger children. Salt and cooking oil are so precious that they purchase tiny amounts and "make it last." Women described to us how they would send a child with a plastic bag to the sari-sari store where the week's ration of oil would be poured. At home, they rubbed the plastic over their cooking grill or pans. These strategies lead "to decisions on food intake being made to favor men and children. The woman will eat the least when there is not enough food. Also, protein foods will go to the man even though the woman's working hours are longer" (Dios and Rocamora 1992: 61). Fourth, women eliminate or delay expenses like electricity, house repairs, health care and clothing purchases. Fifth, they will keep children out of school. Sixth and least successful, they will try to stimulate husbands to broaden their nonfishing income earning or resource gathering.

In the household histories we have recounted throughout this study, fisherwives voice their extreme fatigue from endless work, their constant sense of crisis, their worry about the future, and their reluctance to spend household assets toward their own needs. Women deprive themselves in order to feed children, a decision that exacerbates their higher rates of iron deficiency anemia and other nutritional deficiencies among females of child bearing age. One young pregnant wife is just beginning what will become continuing deprivation for her. "I am always too busy with work," she says, "so I do not take time to eat. I can survive without eating much because I'm not really fond of food." Fifty-six-year-old Manang has practiced such self deprivation all her life. Because of her many hours of oyster gathering and processing, Manang is the foundation of her household's survival. She does not complain that her eighteen-hour day is longer than her husband works. She shows the physical signs of a life of hard work and malnutrition. She is underweight and underheight, and her small frame is beginning to stoop, probably from osteoporosis. When asked if her life has become more difficult, it is hard for her to measure degrees of increase in her blinding work pace and her family's financial

shortages. "Our situation before and now has always been one of hardship. The important thing is to be hard working!"

The explanations of the fisherwives we interviewed reflect notions about "sacrificial motherhood" that pervade Philippine familial ideology and laws (Feliciano 1994). These women are not simply stating personal preferences, for they are acting in line with the ideologies that have emerged historically to justify the structural sexism that is embedded in modern capitalism (Wallerstein 1983). However, they are not simply being controlled by the invisible male hand of capitalist patriarchy. As Tinker (1990: 181) points out, "the bitterest task is to acknowledge the complicity of adult women in socialization for inequality." For more than three decades, Philippine fisher households have had to survive repeated global and national economic downturns through ever-expanding workloads. As a result, their offspring have been educated early in "endlessly toiling" (Illo and Polo 1990: 84). The parents of today's adult Panguil Bay fishers began working at a variety of tasks at an early age. Through observation of parents and their own work assignments, they were socialized by age six into their gendered roles of more or less sacrifice for the sake of family. In turn, they are training their sons and daughters to adhere to gender-biased ideologies and workloads that inequitably shift to females the responsibility for household survival. Consequently, women like Manang become intergenerational bearers of some of the worst gendered inequalities of the capitalist system that keeps them poor and marginalized.

Nationally, households spend far more of their income on male health care services and medicines than is dispensed for females (Heinonen 1994). It is difficult to discern such a pattern among Panguil Bay fishers, for a majority of these adults go their entire lives without any health care services, except the free or cheap services of herbal healers, midwives, or small clinics that do not have doctors. However, the most dangerous form of self-deprivation involves failure to seek health care for pregnant women. As a result, fishing households have the highest incidence of maternal and infant mortality in the country (Bautista and Martillan 2007). Women also deprive themselves of other forms of health care that they budget for husbands and offspring in their households. Even though she has allocated past household income for husband and child dental care, Nina does not go to the dentist about her infected teeth because she would have to lose work time from the palm thatching that is essential to household survival. "I have to work! Hopefully, in the near future, I can attend to my teeth," she jokes. What she does not say is that she cannot afford such dental work, for this household lives on 44 cents per capita daily.

6 Conflict over Household Budget Management

In a majority of Asian households, husbands exercise an inequitable degree of control over their own earnings and over budget priorities. Thus wives who are "responsible" for budgeting and allocation of resources really have a minimal degree of control (UNICEF 2007). "In reality, households do not allocate scare resources through democratic processes; instead, decision-making is controlled and/or manipulated by the most powerful" (Dwyer and Bruce 1988: 235). Consequently, the husband "makes sure that 'his' money is spent to cover basic family needs as well as his desired level of personal consumption." In many households, males withhold part of their earnings, forcing women to make up shortfalls or unexpected expenses. Crises do not necessarily cause husbands to lower their demands for pocket money, so many males take control over part of their wives' income (Beneria and Roldan 1987). Moreover, women are expected to assume responsibility for medical and educational expenditures of children. In many Asian countries, one-third to two-fifths of husbands make decisions alone about daily household expenditures and about health care for wives and children (UNICEF 2007). Moreover, household power struggles are evidenced by the rising incidence of domestic violence. Worldwide, male violence toward women and children is highest during (a) economic downturns and (b) when women become pregnant. In addition, domestic violence increases in contexts in which women contribute more household income than males (White 1993).

Western scholars have overstated "the relative economic equality of men and women" in the Philippines (Atkinson and Errington 1998: 4), and both western and Philippine studies have exaggerated female control over household budgets (e.g., Asong 2000; Upadhyay and Hindon 2005). For instance, Jocano (1983: 145) claims that the Philippine wife "dominates household affairs. She handles and has the authority over the financial management of the family's income. The man turns over to the woman all his earnings and the woman gives him his allowance and other expenditures. ... Generally, the husband helps in all household chores but leaves all the decisions to the wife." In contrast, Philippine feminists have documented a pattern of diminished female control over rural household budgets since the 1990s. Fely David (1994) found that husbands act autonomously in budget decisions far more frequently than their wives. According to Amaryllis Torres (1995: 123), half of rural Philippine wives were bringing in income in the 1990s, but the husbands were the major decision makers in three-fifths of the households. Judging from our interviews, less than one-quarter of fisherwomen have autonomous control over household budgets. In more than half the households, husbands and wives do joint

decision-making, but husbands have autonomous budget control in more than one-quarter of households. In a majority of households, women consult husbands about all major expenses and about health care. In addition, a majority of wives indicated that their husbands did not contribute their total earnings to the household pool. In about one-quarter of households, husbands do not contribute on a daily basis, only providing funds when they sell enough fish to acquire larger amounts.

One wife told us "I am supposed to be in charge of the family budget, but there is no money. When there is not enough, I must find a way to make up the difference." In this statement is embedded the key constraint on female control over fishing household budgets. Little power accompanies cultural assignment of the "purse strings" to wives when income is so limited. Being assigned budget control is meaningless when there is not enough to meet household needs. Indeed, household resource scarcities constrain women. First, their degree of budget control does not position them to alter gender relations in such a way that the total household workload is more equitably allocated.

> The meaning of what may be called women's control of domestic resources and power in the household is really men's ability to shed their responsibility for housework and child care. ... Even when women have some control over their earnings, this does not automatically empower them in any significant way in altering gender relations. ... The family-household system is far from being a power base for women. (Eviota 1992: 152)

Second, budget management obligates wives to devise survival strategies through deeper self-exploitation and self-deprivation when the household income pool falls short of family needs. Delia Aguilar (1991: 49) observed that "the man also has to make sacrifices for the children, true, but the woman's obligations toward her children are quite different." In effect, budget management simply expands the likelihood that the wife's socialization to practice "maternal altruism" and "sacrificial motherhood" will come into play. Because the resource pool is so limited and erratic, the wife's "control is largely illusory, for she has no financial autonomy. The pool she manages must cover unavoidable expenditures. In addition, husbands do not withdraw from the scene after delivering their contribution; rather they exercise several mechanisms of control" (Dwyer and Bruce 1988: 235). Consequently, juggling an inadequate budget exposes wives to a third constraint, i.e., conflict with husbands over the allocation of household resources. According to fisherwives, the context in which household power struggles occur most frequently is connected to the wife's

role in household budgeting. Women must limit male expenditures on their leisure pursuits in order to stretch scarce resources to cover survival needs, so this is a significant area of conflict between spouses. One wife explained that "all the ways of scrimping and saving that one might think of, we have done. ... But the burden of frugality falls on me more than my husband. For instance, at night when he is too exhausted to fall asleep, he might drink a beer. For myself, I don't even take a soft drink. When I have money on hand, I get very nervous thinking that I must set aside even a tiny amount for the day when we have absolutely nothing" (Aguilar 1991: 22). Like many other wives, Nina is outraged by husbands who waste precious household funds to gamble on cockfights, and she and her spouse frequently quarrel about his weaknesses in this area (Interviews).

Philippine fisherwomen have reason to fear such power struggles, for domestic violence has increased 20.5 percent since 1990.[12] Throughout the 1990s, researchers emphasized the rising incidence of domestic violence in the country's fishing communities and pointed to spousal conflict over male leisure expenses as the source of much of the wife battering (Illo and Pineda-Ofreneo 2002). Since 2000, rural Mindanao has exhibited escalating rates of violence toward females, and two-thirds of the cases of physical abuse that appear at hospitals are married females.[13] However, only a small percentage of domestic violence incidents come to the attention of public agencies. For instance, midwives reported that local health clinics are aware of domestic violence in only about one percent of Philippine fisher households, and these are instances in which husbands acted violently toward wives or children after alcohol use. In contrast, interviewed wives reported domestic violence much more frequently. Indeed, women report a growing trend toward alcohol consumption and domestic violence. One woman married young to escape brutality. Her father "was a drunkard who often hit us hard." Another explains that local men "drink alcohol frequently. They go to the barrio center to drink, especially when they sell fish. And when they are drunk, it's often the start of a domestic quarrel at home."

In reaction to disempowerment of women in declining Scottish fishing communities, an elderly wife captured the significance of shifting control over household cash. "Them that sells the goods guide the purse– them that guide the purse rule the house" (Nadel-Klein 2000: 368). Then what are the implications for household survival if male Philippine fishers "sell the goods" and "guide the purse"? A case history will help us see gender budgeting differences

12 Factsheet, PSA website.

13 Analysis of Acebes-Escobal et al. (2002) and provincial data, 2017 Census, PSA.

sharply. In a household that is one of the poorest along Panguil Bay, Vera brings in most of the income and resources while her husband has many days with little or no catch. While she tries to stretch income and credit advances from her palm thatching to cover household needs and debts, her husband demands regular leisure money. There is some fear in her explanation, as she expresses relief that her husband "goes to sleep immediately" after drinking and does not harm her or the children, like some of their neighbors. While their seven-year-old daughter has dropped out of school due to the family's declining resources, Vera applies part of her income to purchase his cigarettes every day. When her husband brings home no fish, she does not purchase this protein source because it costs the equivalent of three packs of his cigarettes. Vera cannot remember when she was last able to buy any clothing for herself, but she selects cheap used apparel for her children from the black market in international relief goods. Moreover, Vera is eight months pregnant but has not been able to accumulate needed resources for the coming baby.

Thus one outcome of greater male control over the household budget is the allocation of too much of the resources toward nonessential items, shifting the burden to the wife to overcome the resultant shortfall. This problem is exacerbated by the different ways in which wives and husbands contribute to the household pool. Three types of household pooling and allocation strategies have been documented in impoverished Asian households, and scholars have positioned rural Philippine households within the group that practices the "household allowance" method.[14] "The household allowance mode operates when a senior woman is given funds and responsibility for basic expenditures such as food and clothing and the daily maintenance of the domestic group. Her authority over decision-making and the management of income allocation exists only in this sphere. The senior male is the principal decision-maker for long-term and costly expenditures" (Dwyer and Bruce 1988: 208–209). For Panguil Bay fishing households, this means that the husband hands over part of his income and resources as "an allowance" to be applied by their wives toward household expenses. Then the wives "make ends meet" by being ingenious at identifying other income sources to overcome the shortfall and at cutting expenses through deprivation (Interviews).

In addition to leisure funds, males make a second type of autonomous decision that conflicts with allocation of household resources toward survival

14 Dwyer and Bruce (1988) describe three types of income pooling and allocation within Global South poor households: "patriarchal" (in which the male has sole control), "pooled income" (in which wife and husband contribute and manage all income equitably), and the "household allowance method" described here.

essentials. The husband has a great deal of latitude to claim household income for the technology that he needs to support his occupation. As a result, a pattern of *bifurcated budgeting* is evident among Philippine fishing households. One fisherwife captured the dilemma when she said:

> Making decisions about our money is very stressful. I fear being reprimanded. He will blame me for deciding about something without informing him. So I ask him if he agrees. If I buy anything, even food sometimes, without letting him know, there will be a fight. He always thinks I have extra money stashed away, and he makes his own plans for that money, even when it is cash I have earned. But he rarely consults me about how he will spend what he gets from his fish sales. Even when he does talk to me, he has already decided on his plan and spent the funds before he tells me about it.

Males make independent decisions about fishing equipment, even when the household budget will be drained to cover them. "We agree' on it," one wife said, "but it's really him who decides." In other words, males make the decision to sink their households into debt bondage so they can try to overcome declining catches by applying more exploitative technologies. As a result, male income must first prioritize debt obligations to financiers. With every catch, the husband "sells the goods" (to use the words of the Scottish fisherwife) to the trader, wholesaler or moneylender to whom he is indebted. He will contribute part of the residue after debt obligations to the household pool. One wife told us "I first have to make sure that I pay the trader who finances his boat and nets. If there is anything left, I can use that for household supplies."

In effect, the fisher household budget is trapped in a vicious cycle of prioritizing debt over survival, and the implications are clear. With bifurcated budgeting, each spouse is responsible for collecting and allocating a different pool of funds. As fisher income declines, wives face increasing pressure and potential violence to keep enough resources for collective household survival, even when they have earned the income over which power struggles occur. From weekly earnings, Philippine households allocate on average 40 to 60 per cent toward male occupational expenses and "pocket money." Moreover, women's control over the marketing of their husbands' harvests has diminished, giving men far greater latitude in decision-making about how their production will be sold and where the proceeds from those sales will be allocated. If fisherwives did historically have a greater degree of control over a resource and income pool to which males contributed equitably (Jocano 1983), women are no longer so empowered. Once fishermen embed themselves into debt

bondage to try to expand their production, they cannot so easily extricate themselves from the export commodity chains that keep them dependent on a continuing flow of credit and advances in exchange for below market prices for their outputs. Survival hinges, then, on the capacity of women to broaden their self-exploitation and to allocate inequitable degrees of deprivation among household members– all within the external framework of a fishery in which ecological resources are being depleted by export agendas.

7 Looking to the Future

Threats to fisher persistence and newly constructed survival strategies are leading to alteration of gendered labor roles in ways that carry serious implications for future survival of Philippine and Asian peasant fisher households. Men's lives are as deeply structured by legal and societal gender expectations as are those of women. Many Philippine fisher husbands are emasculated when they cannot fulfill their responsibilities as "breadwinners," even though their work spaces and their capacities to earn livelihoods have been disrupted and uprooted by export strategies over which they have no control. In light of the weakening male position as the primary income-earning breadwinner, future household survival is likely to hinge upon the capacity of men to put aside traditional gender norms and to assume more of the unpaid household labor and provisioning that women have done in the past.

CHAPTER 7

Climate Change, Land Grabbing and the Future of Asian Food Security

Abstract

The crises facing food security and peasant food producers in the Philippines derive from the unfolding structural trends of the larger region and of the capitalist world-system. Even though they account for more than three-quarters of the world's farm operators and fishers, the peasant producers of the sixteen major Asian fisheries are largely invisible in the global politics over world food security. We investigate climate change and land grabbing as threats to Asian food security and peasant persistence, and we address the question of whether there is likely to be the transition to large farms in Asia that has occurred historically in richer countries.

> Admitting our food system is failing calls into question capitalism itself.
>
> (ERIC HOLT-GIMENEZ 2018: 18–19)

In Chapters 2 through 6, we have undertaken an ethnographic case study of the Philippines which once was globally ranked much higher for its fishery and aquaculture outputs than it does in the early 21st century. The boom to bust cycle and the depeasantization policies of the Philippines are not unique history, for similar patterns have occurred in all the Asian fisheries. The Philippine food security crises and threats to peasant food producers derive from the inequitable structure of the capitalist world food system. In order to emphasize that point, we return in the final two chapters to the regional examination that we initiated in the first chapter. Nearly three decades ago, Eric Hobsbawm (1994: 289) declared that the death of the world's peasantry was "the most dramatic and far-reaching social change of the second half of the twentieth century." But he was wrong! In 2020, peasant farmers and fishers accounted for nearly

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half of the world population, a majority of them concentrated in the sixteen Asian fisheries. Despite the accumulated Asian production statistics (FAO 2018, 2021c) and the labor crises caused by the global COVID-19 pandemic (FAO 2020a, 2020b, 2020c), the Food and Agriculture Organization (2021c) defines conflict, climate variability and economic slowdowns to be the most significant 21st century drivers of global food insecurity, thereby blatantly failing to take into account the vulnerabilities of peasant producers, most especially the Asian agricultural and fishery workers. To a greater degree than their peers anywhere else in the world, Asian peasants are threatened by poverty, hunger, nutrition-related illnesses, exploitative labor practices, and landlessness, exacerbated by public depeasantization policies (see Figure 20). Even though they feed the world, Asian peasants are largely invisible in the global politics over world food security. However, the world food system is dependent on the labors and sacrifices of Asian peasant farmers and fishers (see Chapters 1 and 8). In this chapter, we will explore the two worst 21st century threats to Asian food security and to the persistence of Asian peasants: climate change and land grabbing.

1 Climate Change, Peasant Persistence and Asian Food Security

At current levels of global greenhouse gas emissions, "the world remains on course to exceed the agreed temperature thresholds… which would increase the risks of pervasive climate change impacts" (WMO 2021: 37). The Intergovernmental Panel on Climate Change (2012: 20–25) predicts five major climate changes to occur in East, South and Southeast Asia over the first half of the 21st century: temperature extremes, increased number and frequency of heavy rainfalls, increased speed and number of tropical cyclones and typhoons, increased drought periods, and rising mean sea level accompanied by extreme coastal high water levels. For those reasons, climate change will be the greatest threat to the survival of Asian peasant farmers and fishers in coming decades. Indeed, climate change is already the risk factor that impacts the greatest number of Asians every year. Ecological disasters destroy peasant housing, crops, and livelihoods, forcing many to migrate. Ecological disasters cause the greatest damage to *peri-urban* areas (see Chapter 8) where peasants are increasingly concentrated. Debt bondage and forced labor increase after ecological disasters (see Chapter 8), and ecologically damaged lands become more vulnerable to land grabbing, peasant displacement and food insecurity.

1.1 Climate Risks Facing the Asian Fisheries

The *climate risk index* measures the degree to which countries have experienced extreme weather events between 1999 and 2018.[1] As Table 14 shows, nine of the Asian fisheries ranked among the world's 25 highest risk countries over this period (Eckstein et al. 2019). Worldwide in 2017, nearly 19 million people were displaced by climate-related disasters, and 52 per cent of them were located in the Asian fisheries. Nearly three-quarters of these ecological displacements occurred in the Philippines and China while Bangladesh, Vietnam and Indonesia accounted for another 20 percent. One of the most climate vulnerable countries in the world, Bangladesh averaged 700,000 people displaced annually by rapid-onset natural disasters over the last decade (Smith and Henly-Shepard 2021). Since 2010, several of Pakistan's coastal communities have been forced to move further inland due to seawater intrusion and salinization of farm lands and inland fishing areas (IDMC 2021). In Vietnam, ten disasters caused 633,000 displacements. Climate change experts predict that "sudden-onset disasters are likely to displace an average of more than a million people in any given year in the future, giving Viet Nam the 4th highest disaster displacement risk ranking behind India, China and Bangladesh" (IDMC 2018: 43). That prediction was validated in 2020.

Between 2010 and 2019, an average of 23.1 million people were displaced by ecological disasters (IDMC 2021), but 2020 proved to be the most extreme in history, most specifically in the Asian fisheries. More than 30.7 million people were displaced by ecological disasters in 2020, and 70 percent of them were situated in the Asian fisheries (see Table 14). In South Asia, there were 7.9 times more people displaced by climate-related events than in 2017, 1.8 times more displacees from Southeast Asia and 1.8 times more displacees from East Asia. Climate change led to massive wildfires across Australia while parts of the Asian fisheries were underwater for extended periods.

> The low-pressure systems of the summer monsoon were particularly strong and slow-moving, allowing them to pick up more moisture than usual from the Indian and Pacific oceans before delivering it to land. ... [In addition to climate change], unsustainable land use, construction on floodplains and the destruction of ecosystems play a critical role.

1 The index "does not take into account important slow-onset processes such as rising sea-levels, glacier melting or more acidic and warmer seas. It is based on past data and should not be used as a basis for a linear projection of future climate impacts" (Eckstein et al. 2020: 2).

Large-scale infrastructure projects such as dams also alter entire river basins and increase flood risk upstream and drought downstream. Dam failures and releases also increase downstream displacement risk, as has

TABLE 14 Climate risk for the major Asian fisheries, 1999–2020

Fishery territory	Climate risk index (1999–2018)	No. (% world total) ecologically displaced persons (2017)	No. (% world total) ecologically displaced persons (2020)
Part A. South Asia			
Bangladesh	7	946,000	4,443,000
India	17	79,000	3,856,000
Pakistan	5	1,800	829,000
Sri Lanka	22	135,000	19,000
Total		1,161,800 (6.2%)	9,147,000 (29.1%)
Part B. Southeast Asia			
Cambodia	12	15,000	66,000
Indonesia	77	365,000	705,000
Malaysia	114	82,000	24,000
Myanmar	2	351,000	505,000
Philippines	4	2,529,000	4,449,000
Thailand	8	50,000	41,000
Vietnam	6	633,000	1,267,000
Total		4,025,000 (21.4%)	7,057,000 (23.0%)
Part C. East Asia			
China-Mainland	43	4,473,000	5,074,000
China-Taiwan	nl	20,000	3,500
Japan	62	21,000	186,000
North Korea	NL	NL	5,300
South Korea	87	4,300	19,000
Total		4,518,300 (24.0%)	5,278,800 (17.2%)

SOURCES AND NOTES: THE CLIMATE RISK INDEX IS FROM ECKSTEIN ET AL. (2020). THE ECOLOGICAL DISPLACEMENTS ARE FROM IDMC (2018, 2021). NL = NOT LISTED

> been the case in the Mekong river, that is undergoing rapid change across six countries, from China to Viet Nam. Many rivers in China rose above warning levels in 2020 and 77 reached record highs. (IDMC 2021: 27–28)

Throughout South and Southeast Asia in 2020, monsoon rainfalls averaged 9 percent above historical averages. More than 16.2 million were forced from their homes and livelihoods in South and Southeast Asia, with another 5.3 million from East Asia. Nearly 90 percent of the displacements were from Bangladesh, India, the Philippines, China and Vietnam. By mid-2020, one-quarter of Bangladesh was underwater, disrupting the communities and livelihoods of 4.4 million peasant farmers and fishers. For the Philippines, 2020 brought two typhoons close together, the eruption of Mount Taal, and several flooding and landslide events. Storms triggered more than 1.2 million displacements from Indonesia and Myanmar. In Indonesia, 397,000 were displaced by flooding in Jakarta which sits on a swamp and is sinking due to sea level rise (IDMC 2021).

Loss of livelihoods is the greatest economic cost to countries impacted by these ecological disasters (IPCC 2012). Over the last two decades, agriculture and fishing in South and Southeast Asia have been repeatedly disrupted by sea level rises or heavy storms. Peasant farmers and fishers of the Indo-Gangetic Plain, the Mekong Delta and along the Yangtze River will continue to be especially vulnerable. There are also likely to be more unusual weather events that threaten crops and fish reproduction. In Pakistan, for instance, extreme 2020 weather caused a double whammy of livelihood losses. After heavy monsoons and floods destroyed crops and livestock, unusual breeding of the desert locust was stimulated, destroying another third of the crop area (IDMC 2001).

1.2 Climate Migration in the Asian Fisheries

The Groundswell Report (World Bank 2018) predicts that, by 2050, there will be 216 million climate migrants displaced within countries or forced across national borders. About 41 percent of those relocations will occur in South and Southeast Asia which is predicted to lose 1.8 percent annually due to climate change. Seven major climate-related changes are likely to threaten the livelihoods of Asian peasant farmers and fishers: a 10 percent increase in rainfall, a 10 to 15 percent rise in sea level, increased speed and frequency of cyclones, a 30 percent increase in land made nonproductive by saltwater intrusion, greater salinization of major river deltas (impacting inland fishing and rice production), greater destruction and degradation of coral reefs, and

widespread contamination of fresh drinking water. The Report estimates that 28 million South and Southeast Asians will be impacted by heat extremes and coastal flooding. A 12 per cent crop loss for Asian grain production may occur while fisheries may be directly threatened by warmer oceans, sea level rises, ocean acidification, and rising CO_2 concentrations.

Asian aquaculture will face worsening threats from cyclones and salinization from flooding. Asian fishers can expect a 25 percent drop in coral reef catches, and the Mekong Delta will probably lose as much as 2.6 million tons annually, mostly from inland river fishing. "The projected degradation and loss of coral reefs, decreased fish availability, and pressures on other near-coastal rural populations due to sea-level rise within the next few decades is likely to lead to diminishing livelihoods in coastal and deltaic areas" (World Bank 2018: 69). According to the World Meteorological Organization (2021: 37), Asian farmers and fishers are likely to "be subject to repeated and frequent displacement, leaving little time for recovery between one shock and the next." Asian communities constructed in peri-urban areas are likely to be most hard-hit by extreme weather events because they are located in floodplains or on coasts or rivers where they are vulnerable to rises in sea level (World Bank 2018).

1.3 *CO_2 Emissions of the Asian Fisheries*

Recent rhetoric focuses on Asia as the pivotal region to "stabilize" climate change, to use the words of *The Economist* (30 Oct. 2021). This is a political, not a realistic, assessment of world climate change because it is intended to shift global attention away from the fossil fuel track record of the rich western countries. At the 2021 Glasgow Climate Pact Conference, western representatives singled out coal dependence of the public electrical systems of China, India, Bangladesh, Indonesia, Pakistan and Vietnam. Backed by China and other coal-dependent developing countries, India led a last-minute effort to reject a clause calling for phasing out coal-fired electrical systems. The pact was saved by a last ditch wording change to "phasing down coal."[2] Reducing fossil fuel consumption in Asia threatens a much larger labor force than would be impacted in the western countries. Those directly impacted will encompass the 1.3 billion peasant farmers and fishers and informal sector, ranging from coal mine laborers to gas-powered agricultural equipment and fishing boats, to street cooking equipment, to the operators of jeepneys and motorcycle taxis.[3] Table 15 clarifies the global climate record. In reality, the coal-dependent Asian countries, with the exception of China, do not account for a majority of greenhouse and CO_2 emissions. Indeed, eleven of the Asian fisheries rank

2 Digital conference coverage by *Associated Press* (13 Nov. 2021) and *Reuters* (14 Nov. 2021).

3 "Asia's Informal Workers Risk Losing out in Green Economy Push," *Reuters* (2 Dec. 2021).

well below world emissions per capita of consumption-based CO_2 emissions, with only China, Japan, Malaysia, and South Korea above the world average. Worldwide, the average person produces 2.9 times more CO_2 emissions than the typical resident of one of the eleven fisheries at highest risk (see Table 15). More starkly, an American citizen is responsible for 8.4 times the CO_2 emissions of a resident of those eleven fisheries (see Table 15). It is a bitter ecological irony that little more than 11 percent of the world's greenhouse emissions are produced by the nine Asian fisheries that rank among the top 25 countries that are most likely to experience more frequent natural disasters caused by climate change. Contrast that with the four Asian fisheries that generate nearly a third of the world's greenhouse gases but face much less risk of natural disasters.

Despite the high CO_2 emissions by the richest countries, there are two Asian fossil fuel trends that have serious implications for regional food security. On the one hand, we pointed out in Chapter 1 that the hungriest Asian fisheries are growing increasingly dependent on petroleum. Indeed, they expend nearly eight times more on petroleum than they do on food imports. For instance, India's food imports cost only 13 percent of what the country pays for petroleum (see Table 9). On the other hand, all the Asian fisheries publicly subsidize coal and petroleum to a degree they do not provide in per capita food subsidies. These per capita annual fossil fuel subsidies range from less than $1 in the Philippines (the only country in which food subsidies exceed petroleum) to more than $63 in Indonesia (a per capita subsidy that is 2.3 times greater than that of the United States and 1.7 times greater than China's subsidy).[4] To put things in perspective, twelve of the Asian fisheries fall below the American subsidy, with Indonesia and China exceeding and India, Japan and South Korea falling very close (see Table 15). Those eleven Asian countries that fall below world per capita CO_2 emissions expend less than 12 percent as much on fossil fuel subsidy as the European Union and only about 10 percent of the Australian subsidy. Still the Asian role in fossil fuel consumption is clear. Combined, China, the United States, the European Union, Russia and Japan account for two-thirds of world fossil fuel consumption and two-thirds of the world's CO_2 emissions. While CO_2 emissions have declined between 1990 and 2020 for the United States, the European Union, Russia and Japan, emissions were 4 and 4.8 times greater in 2020 for India and China (Crippa et al. 2021).

1.4 *Climate Emission Reduction and REDD Projects*

In addition to negative impacts on agriculture, food security and human safety, there is another way in which climate change will impact Asian peasant

4 Throughout this chapter, monetary values are expressed in $US.

TABLE 15 A Comparison of climate change risks and emissions

Country	Global climate risk index: Probability of natural disasters (1999–2018)	% World's greenhouse gas emissions, 2018	CO_2 emissions tons per capita, 2020	2020 fossil fuel subsidies per capita in $US
Part A. Asian fisheries that have lower emissions than world CO_2 per capita (4.78 tons)				
Bangladesh	7	0.50	0.64	8.64
Cambodia	12	0.08	0.95	1.55
India	17	7.07	1.74	21.69
Myanmar	2	0.28	0.69	11.08
Pakistan	5	0.99	1.04	6.23
Philippines	4	0.46	1.27	0.31
Sri Lanka	22	0.08	1.13	11.28
Thailand	8	0.85	3.68	5.96
Vietnam	6	0.82	3.27	2.79
Indonesia	77	2.10	2.09	63.12
North Korea	NL	0.09	1.25	NL
Total or Average	–	13.32	1.63	14.67
Part B. Asian fisheries that have higher emissions than world CO_2 per capita (4.78 tons)				
China, Mainland	43	26.84	8.20	37.21
Japan	62	2.48	8.39	22.87
Malaysia	114	0.63	7.98	3.06
South Korea	87	1.48	12.07	26.94
Taiwan, China	NL	0.63	11.78	–
Total or Average	–-	32.06	9.03	29.87
Part C. Comparative western data				
United States	10	12.30	13.68	26.99
Australia	43	1.14	15.22	286.16
United Kingdom	58	0.91	4.66	186.04
European Union	–	7.67	5.91	125.25
Total or Average	–	22.02	11.14	140.68

SOURCES: THE CLIMATE RISK INDEX IS FROM ECKSTEIN ET AL. (2020). EMISSIONS ARE FROM EMISSIONS DATABASE FOR GLOBAL ATMOSPHERIC RESEARCH. FOSSIL FUEL SUBSIDIES ARE FROM HTTPS://FOSSILFUELSUBSIDYTRACKER.ORG/ (ACCESSED 25 NOV. 2021). NL = NOT LISTED

communities in the 21st century. Since 2005, international climate change programs have reached into rural areas of the Asian fisheries. Notwithstanding low emissions, all the Asian fisheries signed the United Nations Framework Convention on Climate between 1992 and 1995, as well as the 2021 Glasgow Global Climate Pact. Starting before 2005, two types of mitigation program were initiated in Asian rural areas, displacing and disrupting farming and fishing communities and threatening livelihoods. The first climate mitigation projects to impact Asian communities were associated with the global marketing of *carbon offsets*. The Clean Development Mechanism of the Kyoto Protocol allows emission reduction projects in developing countries to earn certified emission reduction (CER) credits, each equivalent to one ton of CO_2. These CERs can be marketed by the producing country to industrialized countries to meet part of their emission reduction targets. For example, Switzerland uses CERs to offset 10 percent of emissions from domestic aviation while Germany offsets 40 percent of emissions from buildings and transport. Between 1997 and 2005, there were 3,000 projects in developing countries, two-thirds of them concentrated in the Asian fisheries (Michaelowa 2012). Between 2005 and 2011, offsets sold in private markets were valued at $2.854 billion and $2.01 billion between 2014 and 2020.[5] To get a sense of the kinds of carbon offset projects that are being implemented in the Asian fisheries, we examined the four months of carbon emission certifications leading up to the signing of the Glasgow Climate Pact in November 2021. Over this period, the database lists 101 projects in fourteen countries, three-quarters of them concentrated in nine of the Asian fisheries. As Table 16 shows, Certified Emissions Reductions are valuable export commodities for Asian countries, selling at $3 to $6 per ton in 2021 (International Carbon Action Partnership 2021). Over this four-month period Asian CERS were marketed to Australia, Japan, and nine European countries, and 69 percent of them originated in countries with low emissions (see Table 15).

Nearly 28 percent of the CERS were earned by the largest and most ecologically significant project. By modernizing its natural gas distribution system, Bangladesh will eliminate dangerous gas flaming and explosions and will accumulate more than 4 million emissions annually over the next ten years to the benefit of Denmark.[6] There are 47 wind farms in China, India, South Korea and Vietnam among the carbon offset projects. China and India are world leaders in wind power, including the development of offshore wind farms.[7] The projects include fifteen hydroelectric dams, three solar projects, ten waste to

5 Analysis of "State of the Voluntary Carbon Markets 2021," https://www.foresttrends.org/publications/stateofthevoluntarycarbonmarkets2021/ (accessed 28 Nov. 2021).

6 https://www.psldhaka.net/ (accessed 1 Dec. 2021).

7 Global Wind Atlas, https://globalwindatlas.info/ (accessed 1 Dec. 2021).

TABLE 16 Trading in carbon offsets: Certified emission reductions issued to Asian countries (July to October 2021)

Country	Project	Certified emission reductions issued in tone of carbon offsets	Emission reductions marketed to:
Bangladesh	reducing natural gas leakage in national distribution network (10 year project with annual CERs)	4,049,551	Denmark
China	8 wind power projects; hydroelectric power (4 dam projects); 2 solar power projects; 1 waste to electricity project	3,949,773	Australia, Germany, Netherlands, Sweden, Switzerland, United Kingdom
India	32 wind power projects; 5 solar power projects; hydroelectric power (5 dam projects); electricity from mustard crop residue; 2 biogas or biomass to electricity projects; 1 natural gas to electricity project	4,745,201	Australia, Germany, Italy, Japan, Netherlands, Spain, Sweden, Switzerland, United Kingdom
Indonesia	hydroelectric power (3 dam projects); 1 solar power project; 1 geothermal project	309,971	Australia, Netherlands, Switzerland
Malaysia	1 landfill gas recovery project	47,912	Australia, Japan, Netherlands, Switzerland
Pakistan	hydroelectric power (1 dam project)	272,077	not sold at the time data were collected
South Korea	3 wind power projects; 2 biogas or biomass to electricity projects; 1 tidal power project	501,476	Australia, Japan, Netherlands, Switzerland

TABLE 16 Trading in carbon offsets: Certified emission reductions issued to Asian countries (July to October 2021) (*Cont.*)

Country	Project	Certified emission reductions issued in tone of carbon offsets	Emission reductions marketed to:
Thailand	1 wind power project	61,708	Switzerland
Vietnam	3 wind power project; hydroelectric power (2 dam projects); 4 methane recovery projects	648,723	Netherlands, Norway, Sweden, Switzerland
Totals	79 projects	14,543,480	11 of the richest countries

SOURCE: ANALYSIS OF ALL ENTRIES FOR ASIAN COUNTRIES BETWEEN 1 JULY AND 31 OCT. 2021, DATABASE FOR ISSUANCE OF CERTIFIED EMISSION REDUCTIONS, UNFCC, HTTPS://CDM.UNFCCC.INT/ISSUANCE/CERS_ISS.HTML (ACCESSED 1 DEC. 2021). EACH CER IS EQUIVALENT TO ONE TON OF CO2 EMISSIONS

electricity projects, and one natural gas to electricity project. There are also cutting edge approaches, including a geothermal project, a landfill gas recovery project and a tidal power project. While Australia, Japan and the European countries continue to subsidize fossil fuels to support their inequitable creation of emissions (see Table 15), these Asian countries with low emissions operate like *carbon sinks* for them. Through the carbon offset approach, both distant beneficiaries and Asian states externalize to rural communities the threats to livelihoods, village displacements, destruction of fishing habitats, and any dangers associated with managing a natural geothermal site or recovery of biogases or methane. Both the wind farms and the dams have required the displacement of large numbers of farmers and fishers, resulting in threats to livelihoods and a great deal of ongoing resistance activity from indigenous peasants. Wind farms are placed in agricultural areas which includes putting them in the middle of rice paddies in China and India. Coastal wind farms cause below-water noise pollution that has altered fish migration and reproductive patterns, leading to depopulation of some species. Moreover, the wind towers are closed to human traffic (even though they attract colonies of mollusks and crustaceans), causing loss of fishing grounds, declining catches and the need to go deeper into the ocean to fish (van Hoey et al. 2021).

The second climate mitigation projects to impact Asian communities have been the global efforts to end the 1.5 billion tons of annual CO_2 emissions caused by deforestation. Since 2000, the REDD and REDD+ programs have been treating Asian forests as massive carbon sinks for fossil-fuel burning countries.[8] In 2015, forests contracted to the REDD program were credited with absorbing the equivalent of 14 percent of global fossil CO_2 emissions and 10.5 percent of greenhouse gas emissions. The European Union relies on REDD projects to offset as much as a third its CO_2 emissions (Crippa et al. 2021). Because Southeast Asia had the highest rate of forest loss in the tropics between 2000 and 2010, the UN-REDD program heavily targeted that region (Graham et al. 2016: 1). Exceeding any other Asian country, Indonesia displaced 44.1 million hectares of forest, half for logging, timbering and oil palm and half for a telecommunications network (Lang 2016). By 2019, twelve of the Asian fisheries were participating in the REDD program, and the largest tracts of forest were under contract for REDD funding in India, Indonesia, China, the Philippines and Vietnam. By 2019, seven countries had received nearly $2.1 billion, but 89 percent had gone to India, Indonesia and China (see Table 17).

There is an inherent economic contradiction between simultaneous use of Asian forests for the production of market exports and as spaces protected from deforestation. Consequently, three faulty assumptions underlie the REDD program. According to Carbon Trade Watch (2017), REDD+ makes it possible for polluting states and industries in the Global North to take control of carbon stocks stored in forests in the Global South, as a cheap strategy to protect continued Northern fossil-fuel pollution. Second, factual errors underlie the justifications and goals for the REDD program, for there is a sharp disconnect between the levels of emissions from deforestation and fossil fuel consumption.

> Emissions from global forest destruction and degradation were estimated in 2017 at 10–20% of all human-induced GHG output. ... Fossil-fuel combustion and industrial processes accounted for 78% of the total increases in GHG emissions between 1970 and 2011. ... Recent research shows that tropical forests are increasingly victims of climate change, becoming carbon contributors instead of carbon sinks. ... For these reasons, it may be unwise to put too much emphasis on forests as a cure for humanity's emission problems.

8 REDD = Reducing Emissions from Deforestation and Forest Degradation.

TABLE 17 Climate change funding to the major Asian fisheries, 2015–2021

Country	REDD+ external funding in $US for reductions in deforestation through 2019	UN climate adaptation fund grants, approved through 2021 in $US	Green climate fund concessional loans committed, 2015–2020 in $US	Multilateral development banks concessional loans committed, 2015–2020 in $US	Climate change Debt $ to each dollar of UN climate change grants
Part A. Countries below the world average in greenhouse gas emissions					
Bangladesh	2,300,000	17,537,717	368,600,000	7,981,000	21.47
Cambodia	[a]	14,954,273	104,000,000	594,000,000	46.58
India	727,950,000	14,330,434	315,400,000	18,566,000	23.30
Indonesia	610,660,000	23,442,902	5,187,300	5,025,000	0.44
Myanmar	[a]	7,909,026	45,700,000	1,242,000	5.94
Pakistan		10,000,000	125,100,000	6,395,000	13.15
Philippines	111,870,000	0	91,500,000	4,641,000	100% debt
Sri Lanka	4,000,000	7,989,727	77,900,000	1,738,000	9.97
Vietnam	107,150,000	9,845,292	0	3,623,000	0.37
Part B. Countries near or above the world average in greenhouse gas emissions					
China	524,360,000	0	100,000,000	12,551,000	100% debt
Malaysia	[a]	0	61,400,000	0	100% debt
Thailand	[a]	3.500,000	22,800,000	1,103,000	6.55

a a country that had submitted emission mitigation results but payment amount was not reported in the 2020 annual report. The second column is derived from country project data, UN Adaptation Fund, www.adaptation-fund.org (accessed 23 Nov. 2021). The third column is derived from analysis of country data in Green Climate Fund, https://www.green.climate.fund/countries (accessed 22 Nov. 2021). The fourth column is derived from analysis of country data in EBRD (2021: 53–59).

SOURCES: THE FIRST COLUMN IS DERIVED FROM BILDERBEEK (2019: 22), COUNTRY REPORTS AT WWW.UN-REDD.ORG (ACCESSED 20 NOV. 2021), AND UN REDD PROGRAM ANNUAL REPORT AT HTTP://MPTF.UNDP.ORG/DOCUMENT/DOWNLOAD/27066 (ACCESSED 20 NOV. 2021).

Third, when evaluated "as a disincentive to clearing forest," the REDD project "has failed miserably" (Lang 2016: 5–8). The geographical spaces encompassed by Asian REDD projects are very small when compared to the areas that are deforested for logging, timbering, mining, infrastructure construction, and monocultural plantations. Less than one percent of total tropical forest area in Asia is under certified forest management (Graham et al. 2016: 8) because the climate change mitigation efforts cannot compete financially with lucrative export commodities. Studies of the value of carbon stocks in Indonesian forests indicate that payments from the REDD program will be well below the $22 per ton needed to be competitive with profit from oil palm (Deininger et al. 2011: 21).

> Buying oil palm and timber permits, where operations cause severe degradation or deforestation and conserving these forests, are expensive options for REDD+. ... Limiting the expansion of new oil palm and timber plantations in forests is vitally important for biodiversity conservation, however. it is an expensive practice to pursue for the purpose of mitigating emissions. ... The relatively low uptake of oil palm and timber projects indicates a reluctance from REDD+ proponents to engage in these activities, for financial and/or political reasons, and a challenge in convincing concession holders to cooperate. (Graham et al. 2016: 8)

There are two other longstanding problems. First, countries generate inconsistent emission and carbon offset statistics because the REDD programs have no established definition of what constitutes a *forest* and no guidelines for measuring the degree of *deforestation*. Indonesia defines a forest to be 30 percent tree cover, with no clarification about whether a monocultural plantation species can be forest cover. In contrast, Vietnam defines a forest as having 10 percent tree cover, specifying that converting natural forest to a monocultural industrial tree plantation is considered an enhancement of carbon stock.[9] Second, "one of the main issues of REDD is leakage, as destruction of forests simply moves to unprotected areas."

We lack space to go into detail, but we would like to provide readers a sense of how a few of the largest Asian REDD projects have operated. In early November 2021, the *Washington Post* published an extensive investigation of the strategies that countries employ to *under-report* emissions by *over-reporting* forest cover by as much as 60 percent. Pointing to the country's REDD carbon

9 https://forestsnews.cifor.org/61007/canyoutrustthenumbers?fnl=en (accessed 2 Dec. 2021).

offset claims, the *Post* found that Malaysia's so-called protected forests have been extensively deforested for the development of monocultural oil palm plantations.[10] There have been many attempts to stop deforestation in Indonesia, but all have failed. "The destruction, by fire and by chainsaw, of Indonesia's old-growth tropical forests, has continued and, particularly since 2000, been increasing. ... Since the year 2000, the rate of deforestation has more than doubled... [accompanied by] a 48% increase in the country's total GHG emissions" (Maxton-Lee 2020: 1–2). In conflict with existing REDD agreements, Indonesia passed a 2020 Omnibus Law that strikes down numerous environmental regulations, including a requirement that provinces maintain 30 percent forest cover. The Law also simplifies the process for corporations to operate in protected forest areas. Within months, six new paper pulp mills had either been built or were under construction, getting prepared for Indonesia to export one million tons of pulp annually. A few weeks before the 2021 Glasgow Climate Pact conference, Indonesia terminated its $1 billion REDD agreement with Norway.[11] India's Kaziranga National Park has a ugly history of human rights violations reaching back to the initiation of the REDD agreement. Repeated violent evictions of forest communities resulted in deaths and many injuries. The Indian government put in place a shoot-on-sight policy, resulting in ranger killings of fifty indigenous forest dwellers and few poachers.[12]

In the Mekong Delta, the REDD project forests of three countries have been targeted for illegal logging of rare species. In southeastern Thailand, the project forest has been systematically stripped of endangered Siamese rosewood trees. "A web of traders, middlemen and corrupt officials making their fortunes by channeling rosewood from remote forests to the glitzy furniture showrooms of China. On the surface, the ban on trading Siamese rosewood in Thailand has been tightly enforced. But... bribery and connections with government officials enable some traders to circumvent the law" (Environmental Investigation Agency 2014: 15). Despite an expensive electronic forest monitoring system and dozens of armed rangers, violent Chinese and Vietnamese gangs have pushed the endangered species nearly to extinction to meet the Chinese demand for carved wooden furniture and artwork. Many rangers have been injured and killed, and resident forest communities live under a state of siege. Record levels of deforestation triggered crippling drought in Cambodia after illegal logging

10 https://www.washingtonpost.com/climateenvironment/interactive/2021/greenhousegasemissionspledgesdata/(accessed 1 Dec. 2021).

11 https://reddmonitor.org/category/countries/indonesia/ (accessed 2 Dec. 2021).

12 https://www.youtube.com/watch?v=AHH_vlhnC0I (accessed 2 Dec. 2021).

continued despite a government ban on timber exports.[13] Subsequently, the Myanmar military announced its seizure of 510 tons of illegal timbers, 221 tons of endangered species and 289 tons of teak and hardwoods.[14] In August 2021, Cambodia sold 645,410 carbon credits grounded in offsets calculated for its Prey Land Rainforest. Between 2015 and 2021, 37 percent of the forest coverage was devastated by illegal logging for black market trading in expensive woods for furniture. To exacerbate the situation, the national government constructed a power line across the forest, destroying more trees (Friends of the Earth 2021). As illegal logging escalated, there was conflict between indigenous villagers hired to patrol the forest and government elites who banned the village patrols.[15]

1.5 *Climate Adaptation Projects*

In addition to the two carbon offset programs, the third climate change agenda to impact Asian communities has been, and will continue to be, the funding and financing of *adaptation* projects. Since 2005, climate change adaptation has been the conceptual lynchpin of institutional responses by the United Nations Framework on Climate Change (UNFCC). Grounded in the naive notion that climate change is "governable" through "scientific management" of natural resources and threats, the UNFCC adaptation strategy repackages existing international development planning. "A world of adaptation can be mapped out in terms of a social cartography of vulnerabilities to be ameliorated by building adaptive capacity and forging resilience. ...The idea of adaptation intrinsically lends itself to a technocratic politics that seeks to contain the perceived threats posed by climate change within existing institutional parameters" (Taylor 2014: XI–XII). Adaptation strategies are embedded in the impossible notion that climate change can be slowed without changes in global economic growth that is based on fossil fuels. Ideologically, the UNFCC promises that societies can "adapt to the effects of climate change" without threatening livelihoods, lowering agricultural outputs, or disrupting economic growth.[16] In short, the naive operational philosophy is to make no changes to the activities that are causing climate change and pretend that small scattered projects will mitigate the effects of global warming.

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13 *Open Development Mekong* (17 June 2017), https://opendevelopmentmekong.net (accessed 3 Dec. 2021).

14 *Open Development Mekong* (8 Oct. 2017), https://opendevelopmentmekong.net (accessed 3 Dec. 2021).

15 https://foeasiapacific.org (accessed 2 Dec. 2021).

16 UN Environment Program website, https://www.unep.org (accessed 4 Dec. 2021).

Supposedly, countries can reduce climate vulnerability through tactics like the following interventions that either avoid the underlying global causes or are likely to generate new problems about which the UNFCC adaptation program remains silent.[17]

1. *Relocation of communities*: Even if necessary in the face of rising sea levels, this drastic approach destroys local economies, livelihoods and agricultural outputs (which UNFCC claims to want to prevent) and may possibly trigger ethnic conflicts or maltreatment of indigenous peoples.
2. *Early disaster warning systems*: This is the historical strategy of "running away" that leads to thousands of people internally displaced in problem-ridden camps, as well as the ecological destruction of businesses, agriculture and infrastructure.
3. *Building roads, bridges, railroad lines and underground transport to withstand storms and flooding*: These infrastructural changes will require more funding than is currently available. Do the needed technologies for diverse ecological contexts actually exist?
4. *Replanting mangroves along coastlines*: This action is needed to replace the mangroves that were deforested by Asian countries in past decades for the export-oriented aquaculture expansion recommended by the World Bank, FAO and United Nations. Most past mangrove reforestation projects have failed, and many years are required for mangrove growth.
5. *Introduction of new genetically-modified* (*GM*) *crop varieties that are drought and flood resistant to allow the world food system to avoid a sharp decline in global agricultural yields*: First, this strategy assumes that sufficient agricultural lands will survive the salinization that accompanies rising sea levels and natural disasters. Second, it assumes that sufficient farmers, laborers and irrigation systems will survive climate risks. This thinking is far too optimistic in the face of the Asian agricultural and aquaculture labor shortages and food crop losses that occurred during the COVID-9 pandemic (see Chapter 8). Third, such GM varieties will have to be engineered to fit specific climate conditions in specific locations, so not enough of them yet exist. Like previous GM varieties, these new crops will probably require fertilizers and pesticides that contribute CO_2 and GHG emissions, thereby exacerbating the climate risk.

By 2021, nine of the Asian fisheries had received $96.6 million in United Nations Climate Adaptation grants, plus nearly $2 billion in low-interest, long-term loans from the Green Climate Fund and multilateral development banks

17 Review of five of the adaptation strategies that are highlighted at the UN Environment Program website, https://www.unep.org (accessed 4 Dec. 2021).

(see Table 17). It is striking that the Asian fisheries with greenhouse gas emissions below the world average (see Table 15) are taking on significant debt to undertake climate adaptation projects. Moreover, the country debt far exceeds the level of United Nations grants. To every adaptation grant dollar, Cambodia has taken on nearly $47 debt, India more than $23 debt, Bangladesh more than $21, and Pakistan more than $13 (Eckstein et al. 2020). All these adaptation projects are subnational, usually aimed at specific communities or economic activities. Thus, they are not systematically designed as part of a national agenda, and they do not necessarily cooperate with or avoid contradictions with one another, either nationally or internationally. Bangladesh, Cambodia, India, Indonesia and Thailand are expending funds for infrastructure changes to prevent or redirect sea level flooding. Projects to develop alternative livelihood strategies for forest-based indigenous groups have been undertaken by Bangladesh, Cambodia, India, Indonesia, Sri Lanka. Pakistan has allocated much of its adaptation funding to make agriculture and livestock raising more resilient against repeated cycles of floods and drought, accompanied by water scarcity. Myanmar is experimenting with new genetically-modified agricultural species that are tolerant of drought and drier agricultural zones.[18] Some of these countries are experimenting with expensive new technologies, usually imported from western countries. For example, Cambodia has installed eleven biodigesters that are placed in areas with significant waste associated with livestock production for agribusiness commodity chains. At about $1,200 for every five head of cattle, a biodigester relies on anaerobic digestion to convert manure to ecologically-friendly fertilizer and methane that fuels cooking stoves in households.[19]

In its 2020 and 2021 Adaptation Gap Reports, the United Nations Environment Program points to five major shortcomings of the "world adaptation science" that has been applied for nearly two decades.[20] Most significantly, there is very limited evidence (none supplied by these reports) that adaptation strategies lower the climate risks they are funded to diminish. Moreover,

18 Country project data, UN Adaptation Fund, www.adaptatiobn-fund.org (accessed 23 Nov. 2021).

19 Daily maintenance is labor intensive, it gives off some emissions, and there are risks of explosions from gas buildup. https://www.ctcn.org/technologies/biodigester (accessed 27 Nov. 2021).

20 Review of https://www.unep.org/resources/adaptationgapreport2020 and https://www.unep.org/resources/adaptationgapreport2021 (both accessed 5 Dec. 2021). For the World Adaptation Science Program, see https://www.unep.org/exploretopics/climateaction/whatwedo/climateadaptation/worldadaptationscienceprogramme0 (accessed 5 Dec. 2021).

implementation of adaptation projects is not likely to keep pace with increasing levels of risk caused by continued high global levels of fossil-fuel and greenhouse gas emissions, The funding is insufficient to meet the project demand from countries (also noted by European Bank for Reconstruction and Development 2021). Levels of engagement and the quality of adaptation approaches and technologies differ vastly from country to country. The total number of funded projects is too small and too narrow in geographical scope to make any serious impact on lowering climate risk. By 2021, there were 2,600 adaptation projects, most of them subnational in scope. Very few projects are cross–national to tackle broader regional problems. Finally, there is increasing recognition, both nationally and internationally, that "green" nature-based solutions can make important contributions to climate change adaptation, but there are few tangible plans or approved projects. To date, funding spent on organic solutions has been a tiny fraction of total adaptation and conservation finance.

Will UNFCC-funded adaptation strategies shield Asian peasant fishers and farmers from climate risks? The most extreme degree of climate *adaptation* and *resiliency* will be required of those nine Asian fisheries that already rank among the world's top 25 in incidence of devastating natural disasters (see Table 14). It is not likely that the kinds of climate grants documented by Tables 16 and 17 will ameliorate Asian climate risks. Paralleling the failures of past development projects, climate adaptation efforts are under-funded, too small in number, too narrow in geographical scope, and too often driven by the economic interests of national and international elites. These realities will leave Asian peasant fishers and farmers and indigenous peoples in the eye of the climate storm, doubly threatened by the natural forces and by the pressures that result when UNFCC adaptation projects are implemented without sufficient funding, advance planning, or public transparency. These projects are likely to be plagued by the same kinds of domestic conflict, human rights violations and governmental corruption that have handicapped REDD agreements. Furthermore, Asian national governments have set contradictory development and climate goals for the 21st century, reflecting the opposing crosscurrents that characterize international development organizations and banks. Indonesia is typical of the region. At the same time that the Indonesian government targets its forests to be a "carbon sink" for the world by 2030, it intends to double palm oil production by 2025 through deforestation to create 4 million additional hectares of oil palm. In addition, the country will make 5 million additional hectares of mining and timbering concessions in those forests, alongside deforestation to establish 9 million hectares of paper pulp species and to build seven new pulp mills (Angelsen et al. 2012: 58).

According to Antonio Quizon (2013: 56), climate change already alters the known parameters of land tenure for peasant farmers on a regular basis.

> The current effects of the annual monsoon season in Bangladesh provide an illustration of the potential impact and complexity of land tenure issues that come with climate change. ... During the monsoon months, an enormous amount of water flows over relatively flat lands, creating new channels, eroding riverbanks, and shifting silt deposits. In a country with high rural population densities, the social impact is immense. Over one million people a year shift their place of residence as their houses are washed away, or to take advantage of newly created lands. As rivers expand and shrink, new land bars or riverine islands are created. These emerging riverine lands are known as char lands, where an estimated 5% of the population lives – literally, on shifting sands. Settlement and ownership rights of char lands have always been complicated, in terms of ascertaining who owns the land. ... There is a state ordinance that provides that "all newly emergent lands previously lost by dilution should be restored not to the original owner but only to the government". In reality, however, it is often the locally powerful farmers (jotedars) who wrest control over accreted lands.

As we move deeper into the 21st century, worsening climate change will bring three significant impacts on Asian land tenure. The rise in sea levels will impact two-thirds of the world's urban population that resides in South and Southeast Asia. Glacial melt in Asia's mountainous interiors will impact half a billion people in the Himalaya/Hindu Kush region and a quarter of a billion people in China. The collective impacts of extreme weather, rising temperatures, water availability, and soil salinity will impact agriculture throughout East, South and Southeast Asia (Quizon 2013: 56).

2 Land Grabbing and Asian Food Security

The second worst threat to Asian food security and to the persistence of Asian peasants is national and international land grabbing for purposes other than food production. The 2008 world recession triggered a frenzy of investments in an estimated 32 to 82 million hectares, mostly in Africa and Asia (Magdoff 2013; Gironde et al. 2016). Now more than a decade later, it is clear that this process was driven by the funding and policies of international development organizations, growth of global financialization, the liberalization of land laws by Southern countries to facilitate international investment, and western prioritization of biofuels to lower greenhouse gas emissions (Dauvergne and Neville

2010; Zoomers 2010; Anseeuw et al. 2012; OXFAM 2012).[21] Moreover, agricultural land acquisition was only one economic driver; investors also targeted lands for mining, timbering, industrial sites, and tourism projects (Cotula 2012). On the one hand, Asian states made significant changes in national laws that laid the necessary groundwork for foreign and domestic acquisition of land resources (Melepia and Griffin 2019). On the other hand, capitalists and state elites located in Asian semiperipheries (particularly China, India, South Korea, Malaysia, Thailand, Vietnam) aggressively invested in land grabs in Africa and Southeast Asia (Cotula 2012; Land Matrix 2016, Marks et al. 2015).

2.1 *National Land Displacements for Nonagricultural Development*

Since 2000, Asian states have amended and/or created laws to make seizures of large land tracts easier and faster (International Land Coalition 2020). Since the 1990s, the World Bank and the Asian Development Bank have urged such land acquisition legislation to facilitate foreign investments and public infrastructure development (Perempuan 2012; Yoshino et al. 2018). The World Bank and the Asian Development Bank have provided legal, technical and financial assistance to Asian countries seeking to develop investor-friendly land laws (Neef 2021). Since 2004, there have been 2,900 regulatory reforms in 190 countries that address business practices, and one-quarter of those reforms have altered land rights of citizens and management of public lands (World Bank 2017). Beginning in the 1990s,

> the World Bank and a host of donor institutions initiated land titling and administration projects in a number of Asian countries. ... These projects – which aimed to ensure property rights – were the first stage in attempts to bring land systems into an increasingly global marketplace, which requires formal and written systems, legal instruments, privatised property, and land markets. The second stage involved the development of formalised land markets in which land could easily be leased, purchased, sold, or gifted to achieve more efficient land use. ...The third stage was the use of land and property as collateral for accessing credit. Efficient land administration allows the use of land documents to collateralise loans. (Quizon 2013: 40)

21 International development organizations that had promoted land acquisitions in developing countries include (but are not limited to) the World Bank, International Finance Corporation, European Bank for Reconstruction and Development, Asian Development Bank, International Rice Research Institute. FAO (2009a: 1) reacted to the global land grab with this policy position: "international investments in agriculture other than land acquisitions should be evaluated and promoted."

By acting as *land expropriators for capitalists* (Ong 2018), these Asian states are following current favored international policy for developing countries. To regulate national land tenure arrangements and to establish market-oriented, economically "efficient" and "productive" use of land in developing countries, the World Bank has, since the 1980s, advocated and funded formalizing private property rights, easing the sale and lease of state lands for commercial use, systematizing the sale of public land by auction to the highest bidder, and improving procedures for land seizures by states (Deininger and Binswanger 1999; World Bank 2017: 108–114). According to the Oakland Institute (2019: 5),

> Most public land in the developing world is actually used by people as a common good, under customary laws. Communally managed natural resources such as water, forests, savannas, and grazing lands are essential for the livelihoods of millions of rural poor. In customary laws, land is also valued as an ancestral asset with deep social and cultural significance. Ignoring these facts, the [World] Bank is driving governments towards the privatization and commodification of land to enable the expansion of more capital-intensive agricultural production. Suggesting that low-income countries do not manage public land in an effective manner, the Bank prescribes the privatization of public land as the way forward: Governments should become land brokers and transfer public lands with "potential economic value" to commercial use and private ownership, so that the land can be put to its "best use." The World Bank also pushes for the formalization of private land ownership as a way to spur agribusiness investments in capital-intensive agriculture and increase productivity. Part of the process is to make land a "transferable asset" and encourage its use as a collateral for credit. The Bank's premise overlooks the high vulnerability of family farmers around the world, which is further increased when the land that they rely on for their livelihoods becomes an asset that can be traded and speculated upon.

The fourth stage in Asian land policy changes has been the encouragement of national regulations and/or programs that target the lands on which indigenous Asians live and secure their livelihoods. It is quite striking that the latest World Bank (2017: 108–114) report to recommend policies for the management of state lands strongly endorses "gender equity" while ignoring the political and economic biases against ethnic and indigenous minorities. This is a crucial oversight with respect to the Asian fisheries in which so much of public land is occupied by indigenous groups and ethnic minorities. Available land is steadily shrinking, and national governments seek to develop untapped

natural resources, making those forest areas that are inhabited by indigenous communities particularly vulnerable to land concessions and development/infrastructure projects. Indigenous groups are situated on some of the most valuable Asian lands. In ten of the Asian fisheries, 16 to 60 percent of the land area is currently occupied by indigenous groups, and 50 to 93 percent of the deforestation between 2000 and 2020 occurred in indigenous areas (see Table 18). With the exception of China and Japan, much of the valuable forest area of the Asian fisheries is stewarded by communities under customary systems, either on legally recognized public land or on communally managed natural resources (Oakland Institute 2020). In India alone, 104 million *Advisaris* (tribal peoples) are at risk of state eviction for development and infrastructure projects (International Land Coalition 2020). In 2019, the Indian Supreme Court decreed the eviction of more than one million people from forests.[22]

Despite United Nations efforts to secure international agreements to protect indigenous peoples, Asian national governments do not legally protect the traditional land, farming and fishing practices of indigenous peoples (Rights and Resources Initiative 2021; International Work Group for Indigenous Affairs 2021; United Nations 2020; Tamayo 2019; Tauli-Corpuz and Tamang 2007).[23] "Traditional lands under swidden cultivation are often treated as 'barren' or 'marginal' lands and are leased to corporations, including lands that indigenous communities cultivate and leave during the fallow period. Indigenous farming practices are considered to be low-technology and unproductive, with too much 'idle time' among rural labourers" (Quizon 2013: 45). In one study of expropriation of state land in developing countries, the World Bank (2017: 109) found that those groups and households that "are not central to the networks of social and political power... are much more likely to have their land expropriated when it is fallow."[24] In order to appropriate their lands for commercial land concessions, development projects and infrastructure construction,

22 In reaction to public protests, the court order was put on hold but had not been remanded by early 2022 (Land Conflict Watch, https://www.landconflictwatch.org/ (accessed 6 Jan 2022).

23 See "Declaration on the Rights of Indigenous Peoples," https://www.un.org/development/desa/indigenouspeoples/declarationontherightsofindigenouspeoples.html (accessed 7 Jan. 2022).

24 In this study, the World Bank (2017: 108–114) addresses gender inequities with respect to fallow lands but never mentions strong Asian state biases against indigenous swidden or fallow lands. This oversight does not seem reasonable since the study offers land policy scores for seven of the Asian fisheries for which the United Nations (2014) has reported human rights violations against indigenous evictees (India, Malaysia, Myanmar, Philippines, South Korea, Sri Lanka, Vietnam).

TABLE 18 Asian states and conflict over indigenous lands, 2020

Country	No. persons in camps for displaced persons	No. indigenous groups recognized by the state	No. & (% of population) indigenous persons	% country's land area occupied by indigenous people?	Does the state recognize customary land rights of the indigenous groups?	% 2001–2020 national deforestation that occurred in Indigenous Areas
Bangladesh	427,000	54	1,586,141 (9.6%)	17%	no	93
Cambodia	260	24	400,000 (2.4%)	25%	yes, but not implemented	55
China		55	112,605,002 (8.0%)	autonomous nationality areas encompass 60%	no	58
India		705+	104,000,000 (7.5%)	27%	no	
Indonesia		1,128	60,000,000 (21.9%)	22%	no	52
Malaysia		3	4,369,176 (13.5%)	60%	no	56
Myanmar	505,000	0	17,411,200 (32.0%)	50%	no	56
Pakistan	104,000	9	3,341,080 (2.0%)	4%	no	60

Philippines	153,000	18	15,435,000 (14.1%)	33%	yes, but not implemented	51
Sri Lanka	27,000	8	5,501,192 (25.1%)	1%	no	53
Thailand	41,000	38	925,825 (1.3%)	19%	no	52
Vietnam	162,000	53	14,100,000 (14.5%)	16%	no	50

SOURCE: ANALYSIS OF COUNTRY DATA IN IDMC (2021); INTERNATIONAL WORK GROUP FOR INDIGENOUS AFFAIRS (HTTPS://WWW.IWGIA.ORG/); CARTER & HARDING (2015: 118–36); NEEF (2016); TAMAYO (2019); AND GLOBAL FOREST WATCH (HTTPS://WWW.GLOBALFORESTWATCH.ORG/). THE IDMC COUNT IN COLUMN ONE IS ONLY THOSE PERSONS IN CONFLICT WITH THE STATE THAT WERE RESIDING IN CAMPS SERVED BY EXTERNAL INTERNATIONAL AID AGENCIES. THE UNITED NATIONS DECLARATION ON THE RIGHTS OF INDIGENOUS PEOPLES WAS ADOPTED BY THE GENERAL ASSEMBLY IN 2007, BY A MAJORITY OF 144 STATES IN FAVOR, 4 VOTES AGAINST (AUSTRALIA, CANADA, NEW ZEALAND AND THE UNITED STATES), THE REST ABSTAINING. COULD NOT LOCATE INFORMATION FOR COUNTRIES THAT ARE NOT LISTED

Asian states have evicted indigenous communities since the mid-1990s, either moving them into new settlements or forcing them to become migratory laborers (Quizon 2013).

Even though the Asian fisheries delineate legal rights for small peasant farmers/fishers and indigenous peoples (Carter and Harding 2015), these states have ignored those statutes and/or introduced new legislation to facilitate domestic and foreign investment and public infrastructure projects.[25] In order to promote capital penetration where large supplies of untapped marketable natural resources lie, states have redefined rural areas, forests and indigenous or communal lands to be "empty" and "undeveloped." Operating like western capitalist states that rely on the legal right of eminent domain, these Asian states have passed new legislation to create for themselves the *default legal presumption of state ownership of land, with the absence of mandatory procedures for testing the assertions of state title to land* (Hughes 2008; Bekhechi and Lund 2009; Mgbako et al. 2010; Un and So 2011; Carter and Harding 2015). Effectively, then, these states control 100 percent of the lands within their territories, even when there are recorded legal titles to targeted properties. Often supported by bilateral donors and multilateral financial institutions, national and subnational government units have repeatedly employed "land policies and regulations to legitimize land exclusions and commons enclosures under the name of national and economic development" (Hak et al. 2018: 122). National land grabs for domestic purposes

> often have elements of non-compliance with law. Yet in the majority of cases they also involve assertions of lawful title by the state itself. ... The law provides the basis for a broad regime of state-sanctioned land grabs. Land grabbing is not limited to the widespread grant of economic land concessions over agricultural land. It extends to the grant of state concessions for the logging of state forests, the construction of mines and hydroelectric dams, the establishment of special economic zones, and the development of tourist resorts and other commercial projects. In each case, the primary technique is to declare that the land is the public or private property of the state, which means that it may not be the subject of claims to private title on the basis of lawful possession (Carter and Harding 2015: 77).[26]

25 These Asian countries recognize nearly 2,100 indigenous groups, but these groups do not have substantive legal land rights (see Table 18). All states can dismiss indigenous claims that stand in the way of public interests (Neef 2016).

26 For a more detailed synopsis, see Neef (2016: 30–33).

In order to make large land concessions that speed investor development of large-scale agribusiness, extractive industries, tourism projects or infrastructure, national and subnational government units construct two political myths to justify their aggressive displacements. Rural or forest areas are depicted as "empty wastelands," and indigenous settlements are portrayed as "isolated backward communities" cut off from the flow of national development and in need of external financial assistance (Bakker and Moniaga 2010).[27] Through such political rhetoric, nearly 15 percent of India's total area is classified as wastelands (Baka 2013: 413). Since land is legally claimed, owned or controlled by the state, government agencies play key roles in securing domestic and international investments.

> A range of different agencies are involved, such as investment promotion agencies, ministries for agriculture, planning, and land, the president's office, and regional government. ... Governments extinguish local land rights through their power of eminent domain. Several governments (e.g., Cambodia) have made proactive efforts to identify available land that can be allocated to investors. Most governments have set up investment promotion agencies to provide the doorway for those seeking to acquire land, acting as a 'one stop shop' for foreign capital. (HLPE 2011: 17)

Indeed, most of the countries engage in "state-mediated dispossession to produce space for capital" by acting as *coercive brokers* that transfer occupied lands from peasants and indigenous communities to capitalist enterprises (Levien 2013: 381–382). In order to promote the domestic and foreign investment needed to achieve economic growth, Asian political elites adhered to post-1980s World Bank policy (Deininger and Binswanger 1999; World Bank 2017: 108–114) and institutionalized *state expropriation of land* from their weakest citizens (Ong 2018: 364). To lure large investors, Asian states removed people and communities from lands falsely categorized as "empty" in order to offer long term leases with tax and tariff breaks (Robertson and Andersen 2010: 273). "Rural land is commodified while peasant labor power is marginalized" (Levien 2012: 963), generating hundreds of community contexts in which poverty, housing conditions and food insecurity are worsened (International Land

27 For specific country studies, see Hughes (2008); Mgbako et al. (2010); Bekhechi and Lund (2009); Un and So (2011); Bakker and Moniaga (2010); Lucas and Warren (2013); Vo and Hoa (2011); Gillespie and Fu (2014); Woods (2014); Crouch (2014); Henley (2014); Karen Human Rights Group (2012); Kohli et al. (2018); Carter and Harding (2015); Belton et al. (2015).

Coalition 2020; Mahmud et al. 2020; Lucas and Warren 2013: Quizon 2013; Cruz 2011).

Because Asian aquaculture has attracted global and regional finance capital since 2000, land and waterway grabbing for this export-oriented industry have caused thousands of evictions of peasant farmers and fishers from public commons. While small local fishponds have been displaced, control over production facilities, feeds and inputs, and marketing are increasingly concentrated into the hands of a few multinational agribusinesses. Because of waterway and fishpond concessions to large investors, small-scale fishers

> are seeing their access to coastal marine resources denied, and, as they now have to travel further out to fish, their income has dropped. To make matters worse, they are criminalized by private owners of shell fish aquaculture, while corporations gain more control over the local sea food market. ... The local fishers' income has not only reduced, many have actually lost their livelihood and suffer from indebtedness. ... Traditional fisherfolk, [many] of whom are from marginalized castes and tribal groups, have lost their customary rights... and can no longer rely on fishing to sustain their livelihoods. Collectively owned farmland and grazing lands are being turned into shrimp farms, impacting the local food systems. (Pedersen and Tang 2021: 17–18)

India, China, Indonesia, Myanmar, South Korea and Thailand are utilizing new global finance capital to replicate the historical errors of the Philippine boom-to-bust shrimp farming that we documented earlier.[28] By fall 2021, nearly 60 percent of Thai coastal fishing areas had been lost to large-scale aquaculture, and the intense fish farming is destroying underwater currents.[29] Throughout the Asian fisheries, large, export-oriented aquaculture pushes out small farmers and fishers, intensifying land-related conflicts. Moreover, rice and food croplands have been swallowed up for massive fishponds (Mahmud et al. 2020).

Stimulated by international financial institutions, the low and middle income Asian fisheries have undertaken frenetic agendas to integrate their rural areas, forests and natural resources into national goals for the 21st century. On the

28 In previous chapters, we documented land and waterway grabbing for private aquaculture ponds in the Philippines, so that peasant fishers once living on public land now reside under threat of eviction along the edges of commercial fishponds.

29 Thai fisherfolk and NGO activists on YouTube (30 Mar 2021), https://youtu.be/G6iK5r6HfaE (accessed 26 Oct. 2021).

one hand, these Asian states have actively solicited investments in rural areas in order to nationalize ethnic and indigenous minorities that have resisted state control (Neef 2016; Ho and Spoor 2006; Mgbako et al. 2010; Gillespie and Fu 2014; Henley 2014; Karen Human Rights Group 2012; Amnesty International 2018; Springer 2012; McCarthy et al. 2012). On the other hand, these countries (except Japan and China) have taken on massive indebtedness to move quickly to exploit natural resources in those areas and to open "rural frontiers" through new transportation, trading and tourism networks. For instance, Malaysia and Thailand have accumulated a combined debt of $140 billion. Table 19 provides an overview of the extent of these national efforts to modernize infrastructure and to integrate their rural economies more deeply into globalized trade circuits. Since 2000, more than 350 dams have displaced more agricultural and fishing households than any other type of infrastructure projects.[30] In addition to serious ecological impacts, dam construction threatens fishing and aquaculture production and floods large areas of croplands. Typically, corporate enclaves around dams are operated by foreign workers, generating little local employment. While local communities absorb negative impacts, the electricity is sent elsewhere not into impoverished surrounding peasant communities (Baird and Barney 2017; Kakonen and Thuon 2019; Rousseau 2020). Thousands of rural Asians have also been displaced for military bases, coal-fired power plants, railroads, bridges, highways, roads, airports, deep sea ports, harbors, coastal levees, and waste water treatment plants. Public land acquisitions and funding have also gone into heavy industry, including steel mills, aluminum smelters, natural gas refineries, and palm oil refineries (see Table 19).

Since 2000, 789 Asian Special Economic Zones have been developed as comprehensive export-oriented enclaves for manufacturing, mining, agribusinesses, and services, supported by tax, environmental and labor concessions (Sampat 2015). National and subnational government units act as the chief land brokers for the creation of these private enterprises.

> As increased demand for land – driven both by higher growth rates in general and real estate markets in particular – has confronted an inelastic supply in rural land markets, capitalists increasingly turn to the state to use non-market means for making land available for capital accumulation. ... Unlike the older developmental state that expropriated large amounts of rural land for public infrastructure and heavy industries, land brokering in the neoliberal era – culminating with SEZs – proceeds

30 See Table 19 for citations.

TABLE 19 Heavy infrastructure construction in rural areas of the major Asian fisheries, 2000–2020

Asian fishery	Dams	Special economic zones	Major infrastructure construction in or through rural areas	Tourism facilities developed in rural areas
Bangladesh		8	Opening and militarization of Chittangong Hills (indigenous areas) to development: highway, railroad, military base, roads. Threats to small farmers and indigenous in other parts of the country: national highway expansion program, Padma Multipurpose Bridge, 2 coal-fired power plants (one displaced small shrimp aquaculture producers in the southwest).	Chittangong Hills: 7 major tourist complexes in indigenous lands owned and operated by the military which forcibly evicted 28 villages. One-third of the national military based there, in violation of the country's peace accord with indigenous groups.
Cambodia	7	22	Southern Economic Corridor, a trade highway network linking Myanmar, Thailand, Cambodia) and Vietnam. 2006–2018 restoration of 650 km north-south railway system. High-speed railroad (part of China's Belt and Road Initiative). Coal-fired power plant. Military bases.	2006: Koh Kong Island 10,000 hectares concession; 2018: Sihanoukville tourism complex and 70 casinos, with a property boom (thousands of rural households now migrant workers). Boom in casino tourism after national legalization of gambling for cross-border tourists. Casino tourism now occupies 20 percent of the country's coastline after displacement of small farmers and fishers. Military evictions to establish Angkor Archaeological Park for cultural tourism. Fishing communities displaced to construct a deep-sea port and airport to accommodate tourists.

TABLE 19 Heavy infrastructure construction in rural areas of the major Asian fisheries, 2000–2020 (*Cont.*)

Asian fishery	Dams	Special economic zones	Major infrastructure construction in or through rural areas	Tourism facilities developed in rural areas
China–Mainland	230	7	Several railroad projects into rural provinces, including links to western minority territories. Numerous new ports. National goal of 235 new "greenfield" airports by 2035. [lack of government transparency]	[lack of government transparency] National Tourism Administration: no evidence of the kind of tourism infrastructure boom that has occurred in other Asian countries
China–Taiwan	3	11	Post-1995: extensive railroad reconstruction with extensions to develop outlying rural and small town regions with new roads to connect to railroad depots [lack of government transparency]	[lack of government transparency]
India	23	634	2005–2016: 694 projects involving 121,797 hectares. 49 railway projects into outlying rural and indigenous areas. Mumbai–Ahmedabad Railway: land from 104 villages and indigenous areas. National rural roads program. Western and eastern Freight Corridor. 27 thermal power plants involving 78,428 hectares.	Under construction: Multiple private projects along the coats and in rural/mountainous areas, e.g., $748m tourism complex in Oman's Special Economic Zone– coastal impacts. Provincial Governments: "Tribal tourism" and "Human safaris" into indigenous areas have attracted international human rights complaints. Ongoing construction boom of hotels, resorts and eco-lodges along the boundaries of tiger reserves

TABLE 19 Heavy infrastructure construction in rural areas of the major Asian fisheries, 2000–2020 (*Cont.*)

Asian fishery	Dams	Special economic zones	Major infrastructure construction in or through rural areas	Tourism facilities developed in rural areas
Indonesia	16	18 [The 8 largest each include a power plant, hotel resort, a seaport, and airport, bridges, roads]	Numerous highway, levee and road building efforts in rainforests, including coal and logging roads through indigenous areas. Fast- speed railroad (part of China's Belt and Road Initiative). 2 coal-fired power plants (in addition to 8 existing plants). Several mining operations. [lack of government transparency]	Post-2019 national push to become a stronger tourist draw than Malaysia and Thailand. land concessions for 89 tourism resorts in rainforests settled by indigenous peoples [lack of government transparency about 2000 to 2019; post-2019 projects attracted international attention due to human rights violations]
Malaysia	2	3	Two decades of "construction frenzy," funded by $100 billion Chinese debt. 4 industrial parks, steel mill, aluminum smelter, palm oil refinery, natural gas plant, other industrial facilities, expansion of Kuantan Port to accommodate container and bulk cargo ships, mines & quarries in rainforests, coal-fired power plants, waste water treatment plants that dump partially treated waste into rivers or the ocean. $1.3 billion Klang River restoration project. Fast-speed railroad (part of China's Belt and Road Initiative). Many highways	Malaka Getaway: construction of artificial islands. Tourist complex near Seita Wetland State Park. [lack of government transparency about tourism projects; we only found these two because of public protest about ecological damage and human rights violations toward indigenous communities]

TABLE 19 Heavy infrastructure construction in rural areas of the major Asian fisheries, 2000–2020 (*Cont.*)

Asian fishery	Dams	Special economic zones	Major infrastructure construction in or through rural areas	Tourism facilities developed in rural areas
			and roads including the Pan-Borneo Highway through rainforest. Many public-private real estate developments, including the Forest City Project to be built on artificial islands.	
Myanmar	11	11	Southern Economic Corridor, a trade highway network linking Myanmar, Thailand, Cambodia) and Vietnam. High-speed railroad (part of China's Belt and Road Initiative). Coal-fired power plant. Deep sea tanker port.	2013–2021: 38 projects with 36 foreign investors ($1.41 billion). 2013–2017: resort hotel boom with state land concessions. Post-2018: state concessions to hotels in 6 rainforest areas. 7 largest resorts in ecologically and archaeologically protected zones. Boom in casino tourism that is controlled by the military.
North Korea		17	Sinuiju-Uiju Railway extension (international freight via China): extension of Korean State Railway [lack of government transparency]	[lack of government transparency about tourism projects] several state-owned tourism bureaus that primarily cater to Chinese tourists
Pakistan	24	9	Coal-fired power plant. Post-2014 extensive railroad improvement and route extensions [lack of government transparency]	Public-Private Partnerships to develop motels in northern hills where no private tourist facilities existed. 2018–2023 development goal 4 new resorts annually. Public-Private Partnerships to build new airstrips & helipads for private use of tourists. Punjab Govt.: Koshar Tourist Highway

TABLE 19 Heavy infrastructure construction in rural areas of the major Asian fisheries, 2000–2020 (*Cont.*)

Asian fishery	Dams	Special economic zones	Major infrastructure construction in or through rural areas	Tourism facilities developed in rural areas
Philippines	4	19	North-South Railway & Mindanao Rail Network under construction. New bridge over Panguil Bay in northern Mindanao (longest in the country)	2018–2023 PHP4 billion worth of tourism infrastructure projects: Rehabilitation of Burnham Lake & Children's Park in Baguio; Construction of Wastewater Treatment Facility, modular floating docks and solar streetlights in Coron, Palawan; Tagkawayan Beach Tourism Development Project, modular floating docks in various barangays in Puerto Princesa, Palawan; Construction of Housing for Hyperbaric Chamber Facilities in El Nido and Coron, Palawan; Restoration/Rehabilitation of three plazas in Iloilo namely Arevalo, Molo, La Paz Plaza; Reconstruction and Retrofitting of St. Agustin Church and San Guillermo Church; Reconstruction of breakwater in Corregidor Island in Cavite City.
South Korea	14	8	Since 1990s, ongoing development of high-speed railway [lack of government transparency]	[lack of government transparency]

TABLE 19 Heavy infrastructure construction in rural areas of the major Asian fisheries, 2000–2020 (*Cont.*)

Asian fishery	Dams	Special economic zones	Major infrastructure construction in or through rural areas	Tourism facilities developed in rural areas
Sri Lanka	10	8	2 new harbors. Post-2010 railway rebuilding and extensions [lack of government transparency]	Kalpitiya Project, Passikudah Resort & Yala Wild Resort using funds from Asian Development Bank & private investors. 99 year leases. Foreign investment being sought for 3 other major projects with 99 year leases. 200,000 armed forces in northern provinces evicted Tamil farmers and fishers to establish and operate 2 airlines, 21 resort hotels, 3 golf courses, 4 restaurants, 2 whale watching tours, 1 ferry service, 1 diving center and a nature reserve.
Thailand	1	10	$40 billion of international debt for numerous projects. Expansion and renovation of 6 airports. Renovation & upgrading of all single-track railroads. Expansion and renovation of 45 highways. 11 New transnational highways. New high-speed Railroad (part of China's Belt and Road Initiative). Southern Economic Corridor, a trade highway network linking Myanmar, Thailand, Cambodia) and Vietnam.	Construction of 33 ports and related facilities to serve private foreign yachts and cruise ships. Expenditure of funds to support hospitals that service the national "medical tourism"program. Focus on "Indigenous ecotourism" Boom in casino tourism. [lack of government transparency]

TABLE 19 Heavy infrastructure construction in rural areas of the major Asian fisheries, 2000–2020 (*Cont.*)

Asian fishery	Dams	Special economic zones	Major infrastructure construction in or through rural areas	Tourism facilities developed in rural areas
Vietnam	12	4	Southern Economic Corridor, a trade highway network linking Myanmar, Thailand, Cambodia) and Vietnam. North-South Railroad (part of China's Belt and Road Initiative). [lack of government transparency]	2006 Dalat tourism center in the Highlands. 2015: Relaxed real estate ownership laws for foreign investors , leading to a boom in hotel and condominium construction. Major resort development in 5 rainforests. 2020–2025 Can Gio Tourist City within the UNESCO Mangrove Biosphere.

SOURCES: THIS TABLE PROBABLY DOES NOT ENCOMPASS ALL PROJECTS DUE TO THE LACK OF GOVERNMENT TRANSPARENCY ABOUT LAND CONCESSIONS FOR INFRASTRUCTURE DEVELOPMENT. ZOOMERS (2010); CARTER & HARDING (2011); LEVIEN (2011, 2012); MENON (2018); HAYASHI (2021); NEEF (2021); POMFRET (2021); FOCUS ON THE GLOBAL SOUTH (HTTPS://FOCUSWEB.ORG/); NATIONAL GOVERNMENT WEBSITES; "SOUTHEAST ASIAN INFRASTRUCTURE SERIES," *MONGABAY NEWS* HTTPS://NEWS.MONGABAY.COM/SERIES/SOUTHEAST-ASIAN-INFRASTRUCTURE/(ACCESSED 11 DEC. 2021); NUMEROUS MEDIA AND NGO REPORTS, UNITED NATIONS REPORTS OF HUMAN RIGHTS VIOLATIONS, AND WIKIPEDIA ENTRIES.

> under an expansive definition of 'public purpose' that is indistinguishable from private capital accumulation. Elite housing colonies, IT parks, malls and amusement parks have joined the hydroelectric dam and steel mill as causes for expropriating the peasantry. ... The SEZ developer is a state-appointed capitalist landlord who receives windfall returns by commodifying artificially cheap land expropriated from farmers. ... In return for turning farmland into 'developed land parcels', SEZ developer-landlords command a portion of the profits generated by the producing firms inside the SEZ. ... Instead of capital seizing hold of agriculture – the traditional problematic of agrarian political economy – capital is seizing hold of the land, creating a new pattern of agrarian transformation driven by real estate speculation. (Levien 2012: 964)

Comprised of industries, transport linkages, commercial enterprises, tourism facilities and elite housing, SEZs are often privileged enclaves in the midst of rural poverty and exclusion. In Indonesia, for example, the eight largest SEZs each encompass a power plant, a tourism complex, a seaport, an airport, bridges, and roads, in addition to commercial and industrial enterprises. Effectively, the state creates capitalist rentiers "who profit from the transfer of under-valued assets" (Levien 2012: 964). State evictions make available agricultural or forest lands that cannot otherwise be obtained on the market, making those large concessions available at prices well below market value. International trading is made more lucrative in these SEZs which are duty free and afford capitalists tax exemptions (Carter and Harding 2011; Levien 2012, 2013).

Land concessionaires for hundreds of tourism complexes (see Table 19) have received public subsidies for the creation of private enclaves that stand in stark contrast to the displaced farming, fishing and indigenous communities. Tourism facilities have drawn international attention for their high number of human rights complaints by indigenous communities.[31] Construction of airports, seaports, railroads, and highways have also displaced communities to create transport linkages for tourists. In several countries, special laws have been passed to legalize activities like gambling that are illegal for citizens. National and provincial governments play central roles in recruiting foreign investments and manipulating domestic politics to secure land concessions and infrastructure funding (Neef 2021). Rainforests and indigenous areas have been targeted for tourism and for the establishment of national parks and ecological reserves that are designed as tourist attractions. The national military and tourism are tightly linked in Bangladesh, Cambodia, India, Myanmar, and Sri Lanka (see Table 19). The Bangladesh government has prioritized the opening of indigenous areas of the Chittaangong Hills where the military operates seven tourist complexes after the eviction of 28 villages. In Cambodia and Myanmar, the boom in casino tourism is controlled by the military. In Sri Lanka, the military operates two airlines, 21 resort hotels, three golf courses, four restaurants, two whale watching tours, a ferry service, a diving center and a nature reserve in northern provinces. Chinese corporations have sought land concessions from the Myanmar military for tourism complexes along the border (Woods 2011).

In a rare examination of the linkages between tourism and the forced evictions of large groups of people, Andreas Neef (2021: 190, 107) calls attention to the brutal displacement from land and livelihoods that lay the groundwork

31 For sources, see Table 19.

for national tourism projects. In Cambodia, "a large-scale tourism project by a Chinese corporation in Koh Kong Province forced hundreds of families from coastal land they had occupied for many decades; families were given no choice and only meagre compensation; resisting groups have faced violence by private security guards and the Cambodian military; families were resettled into the interior of the Botum Sakor National Park where illegal logging remains one of few options to sustain their livelihoods." Following a 20-year civil conflict in the Chittagong Hill Tracts, the Bangladesh military "has maintained a strong presence to 'securitise' the region for tourism but also controlling a large part of the tourism sector itself. Several hundred indigenous families from the Jumma, Mro and Marma ethnic groups have been forcefully evicted from their land to make way for military-owned tourist resorts popular with domestic tourists." Similarly, the Sri Lanka military "uses the booming tourism sector in the country to provide employment opportunities for its oversized forces and thereby controls a major share of the country's economy, while dispossessing many Tamil citizens, cutting off their livelihood resources and systematically trying to erase their culture and collective memory, a process that is understood by many Tamils as a continuous structural genocide."

2.2 *Impacts of Transnational Land Grabbing*

It is not likely that the post-2008 international land grabbing frenzy would have occurred in Asia if the national-states had not accumulated significant historical experience at employing coercive land displacements to facilitate large land concessions to investors. Globally, the highest incidence of external investments occurred in countries with weak protection of citizen landholding rights (Deininger et al. 2011: 55). Countries that failed to formally recognize land rights were more attractive for foreigners in search of land in the wake of the 2008 commodity price hike. Indeed, most international land investments occurred where there was either a lack of national legal recognition and protection of citizen land rights or a history of public willingness to regulate around such established rights (Deininger et al. 2011; OXFAM 2013: Melepia and Griffin 2019). Table 19 makes clear the causative role of Asian states in facilitating the post-2008 land grabbing frenzy. Asian countries that fail to grant formal land rights to peasants, ethnic minorities and indigenous peoples have been easy targets for large land seizures, both domestic and international (OXFAM 2013; Deininger et al. 2011; Human Rights Watch 2019; Land Matrix 2016). According to a World Bank study, "the quality of the destination country's business climate is insignificant, and weak tenure security is associated with increased interest for investors to acquire land in the country" (Arezeki et al. 2011: 18). Less than one-third of the farm operators held clear title to the land

from which they were displaced; the rest were smallholders on state-owned or ancestral indigenous or ethnic community lands (Land Matrix 2016).

Furthermore, only about 7 percent of the affected communities were provided any advance informed consent by investors (Anseeuw et al. 2012), and less than 13 percent ever received the promised compensation (Land Matrix 2016). According to accumulated United Nations evidence about oil palm plantations in Southeast Asia, the land and labor rights of indigenous peoples are "disregarded, their right to consent is not respected, some are displaced, and they are left with no alternative but to become de facto bonded labourers gathering oil palm fruit for the companies that manage the plantations" (Tauli-Corpuz and Tamang 2007: 9).[32] "Forest, farming lands and rubber gardens have been cleared for oil palm plantation development, reducing livelihood options of the indigenous communities, while fertilizer leaks outside of the plantation grounds and waste water from the palm oil mills pollute the rivers." As forest and farming lands disappear, "the availability of local food shrinks because there are fewer opportunities for fishing, hunting, gathering of forest resources, and growing subsistence crops" (Orth 2007: 12).

To complicate matters, international investments were more likely to occur where there was weak national and subnational political will to protect ecological reserves (Neef 2016; Friends of the Earth 2019; Greenpeace 2021), a tendency that is clear in our analysis of post-2000 infrastructure agendas of Asian states (see Table 19). A majority of the Asian land deals were located in "high biodiversity" areas, much of that land situated within nationally designated reserves. Throughout Southeast Asia, vast land tracts have been grabbed for "large-scale monocultural development... with its heavy reliance on chemical fertilisers and pesticides, massive deforestation and the destruction of valuable ecosystems" (Friends of the Earth 2019). Recent research indicates that oil palm is invading ecological havens throughout Southeast Asia, including 3.12 million hectares inside Indonesia's protected forests (Greenpeace 2021). In late 2021, Sri Lanka shocked environmental NGOs by announcing that it is banning palm oil imports and is razing plantations due to environmental threats. National policy will be to replace oil palms with rubber which hosts greater biodiversity and provides more local employment (Rodrigo 2021).

From the accumulated scholarship, we can derive four other generalizations that provide a reliable analysis of post-2008 transnational land grabbing. First, the Asian states mythologized their land concessions to be idle, marginal, and/or uninhabited. "The tendency to neglect existing rights often derives from

32 See also Human Rights Watch (2019).

a legal framework inherited from colonial days – reinforced or more deeply entrenched post-independence – that presumes any unclaimed or unregistered land to be 'empty' and thus available for transfer with few safeguards" (Deininger et al. 2011: 6). In reality, the land deals have converted agricultural lands, destroyed fishing grounds, invaded protected ecological sanctuaries, and/or displaced indigenous communities. "The claim that lots of 'available' land is unused and waiting for development is simply a myth. Most agricultural land deals target quality farmland, particularly land that is irrigated and offers good access to markets... Much of this land was already being used for small-scale farming, pastoralism and other types of natural resource use" (OXFAM 2012: 4). Through analysis of 833 land deals involving 23.8 million Asian hectares, Land Matrix (2016) discovered that 81 percent of the acquired lands had been previously used actively for agriculture, with 58 percent planted in food crops or used to pasture food livestock– 37 per cent operated by smallholders and 44 percent by larger commercial farm owners. Rather than being isolated, a majority of the lands were situated with easy access to urban areas with markets. In short, the land grabbing resulted in massive losses of agricultural hectares and fisheries, resulting in net losses of food producing resources. For production of nonfood exports, investors focused on acquiring the best lands in terms of water availability, irrigation potential, soil fertility, and access to markets, with many acquisitions made in higher-value peri-urban areas (Cotula 2012).

Second, Asian land grabbing has been carried out by domestic, regional and transnational companies, often with the involvement of corrupt government and military officials (Deininger et al. 2011: 62). While there was some land grabbing by global agribusinesses, more than 70 percent of the deals and nearly 80 percent of the Asian land area involved in this historical land grabbing period were orchestrated by regional capitalists and state elites, primarily based in China, India, South Korea, Malaysia, Thailand and Vietnam (Cotula 2012).[33] Many of these land acquisitions were organized as joint ventures between foreign and domestic investors, often involving actors who had been actively recruited by the states where lands were grabbed (Borras and Franco 2011; Marks et al. 2015; Schoenberger et al. 2017). By 2015, nearly 60 percent of Asian land deals had targeted Southeast Asia, 28 percent had targeted East Asia, and 15 percent had targeted South Asia. More than 94 percent of the investors were private companies or individuals while the rest were Chinese and Vietnamese state-owned corporations. Strikingly, domestic investors were

33 For example, Cargill acquired lands in Indonesia and the Philippines; see Salerno (2018).

far less likely to utilize their acquired lands for food production (Land Matrix 2016).

Third, these land deals have not generated added resources for the world food system or for the Asians who live in the countries where the land concessions were made. Early in this global process, many international development organizations, NGOs and scholars erroneously linked these investments to specific national interests in capturing Global South land for future food production (e.g., GRAIN 2008; Robertson and Andersen 2010; Zoomers 2010; HLPE 2011; IFPRI 2009; Deininger et al. 2011).[34] Overwhelmingly, however, these land grabs were driven by high global demand for certain *nonfood* crops, especially palm oil, rubber, biofuels and animal feeds (Ariza-Montobbio et al. 2010; Borras and Franco 2011; Deininger et al. 2011; Pearce 2012; Marks et al. 2015; Gironde et al. 2016; Schoenberger et al. 2017). "Two-thirds of agricultural land deals by foreign investors are in countries with a serious hunger problem. Yet perversely, precious little of this land is being used to feed people" (OXFAM 2012: 3). China's land acquisition pattern points to land grabbing in hungry countries for export commodities other than food. Fears that China was land grabbing for food production in other countries (GRAIN 2008) have proven to be unfounded (Hofman and Ho 2012; Brautigam and Zhang 2013; Brautigam 2015; Myers and Jie 2015). Like other foreign land grabbers, Chinese land acquisitions were concentrated in nonfood crops (Borras and Franco 2011; HLPE 2011; Land Matrix 2016; Schoenberger et al. 2017). Contrary to the popular perception that China dominated African land grabbing, the majority of Chinese land acquisitions between 2000 and 2011 were situated in Southeast Asia (Hofman and Ho 2012). China invested in nearly 2.9 million hectares in Cambodia, Laos, Myanmar, Indonesia—countries with alarming or serious Hunger Indexes—primarily to export palm oil, rubber, and biofuel crops. Only 1.5 percent of the land area was targeted for food production, but the contracted outputs were luxury commodities (cashews, pistachios, fruits).[35] Even when foreign investments were made inside China, nonfoods were prioritized. In a large project not included in the land grabbing databases, two European corporations invested nearly 53 billion Yuan between 2000 and 2015 to lease

34 The investment driver may have been food security for a few Middle Eastern countries, but not for a majority of the investors (Land Matrix 2016). In the earliest book to analyze this global process, Fred Pearce (2012: VIII) made this overstated claim. "Soaring grain prices and fears about future food supplies are triggering a global land grab. Gulf sheiks, Chinese state corporations, Wall Street speculators, Russian oligarchs, Indian microchip billionaires, doomsday fatalists, Midwestern missionaries, and City of London hedge-fund slickers are scouring the globe for cheap land to feed their people."

35 Calculated using appendix data in Hofman and Ho (2012).

nearly one million hectares for oil palm. Their construction of twenty palm oil mills positioned China to import and process raw oil palm from adjacent Asian and Pacific producers (Xu 2018).

By analyzing 833 land deals encompassing 23.8 million Asian hectares, Land Matrix (2016) reports that only 30 percent of the transferred lands were used to cultivate food crops or livestock. Nearly half were growing nonfood crops while 25 percent were allocated to tourism, mining and/or industrial uses. Land grabs since 2008 have not only converted land use to nonfood exports but have also shifted thousands of peasant producers from food crops into nonfood contract farming, particularly oil palm and rubber (Pearce 2012; Marks et al. 2015; Gironde et al. 2016). Philip McMichael (2012) labels this an historical *reconfiguration of the global food-feed-fuel industry* in which global alliances of feed-fuel, palm oil, ethanol, and sugar-soy agribusinesses orchestrate the production and marketing of *flex crops* that can be marketed as foods, biofuels, livestock feeds and industrial inputs (Borras et al. 2016).[36] The main drivers for investment in biofuel production in South and Southeast Asia are the European Union and American targets of sourcing transport fuels from renewable sources (McMichael 2010). "While policy-makers in the EU push for cleaner fuel and reduced greenhouse gas emissions, their palm oil imports (from Malaysia and Indonesia) actually destroy rainforests, threaten biodiversity, and cause the conversion of peatlands, which creates carbon emissions" (Quizon 2013: 54). In addition to those nonfood uses, nearly 5 million acres in Thailand, Vietnam, Cambodia, Myanmar and China's Yunan Province were converted from rice paddies and rainforests to monocultural rubber plantations (Pearce 2012: 200).

By 2017, 43.4 million hectares had been grabbed by transnational investors in Cambodia, Indonesia, Myanmar and the Philippines (Marks et al. 2015), primarily for production of palm oil, rubber and biofuel crops for export (Borras and Franco 2011; Pearce 2012; Schoenberger et al. 2017). Indonesia became "one of the world's largest, most systematic and ruthless land grabbing operations in the world," rendering the land rights of rainforest dwellers defunct, displacing great numbers of peasant farmers and substituting a largely migrant labor force. More than 70 percent of the jungle was destroyed, initially for timbering for plywood and paper pulp. Between 2000 and 2009, the Asian lands used to cultivate palm oil nearly doubled (Pearce 2012: 167–171). By 2020, four countries had set goals to convert more large areas to this commodity by 2030 (Pearce

36 Flex crops now include corn, palm oil, soybeans, sugarcane, cassava, coconut, sugar beets, rapeseed, sunflower seeds (Borras et al. 2016).

2012; Gironde et al. 2016).[37] For instance, the Philippine government intends to plant 8 million hectares of oil palm by the end of the decade. To accomplish that, the country will displace existing coconut trees which will put at risk 3.5 million coconut smallholders, only a small percentage of whom can expect to be integrated into the low-labor oil palm estates. There are already two palm oil mills and a few plantations in southern Mindanao (Coca 2020). Since 2000, there has been a significant increase in the number of Asian smallholders who have converted from diverse food crops to monocultural contract farming of palm oil and biofuel crops (OXFAM 2013; McCarthy 2010). In Indonesia, for example, 3.5 million peasant contract farmers cultivate oil palm on 40 percent of the area planted in this crop (McCarthy 2010: 833). By 2019, Indonesia, Malaysia, Cambodia and the Philippines accounted for more than 80 percent of the world palm oil production and more than 90 percent of exports, 42 percent imported by China, India and five other Asian countries.[38]

Fourth, depeasantization is the real agenda of large land acquisitions. Philip McMichael (2012: 693) contends that "the land grab effectively authorizes removal of rural populations from ancestral lands to install 'agriculture without farmers.' Domestic and transnational capitalists and their domestic compradors (landed elites, agribusinesses, state officials) monopolized the created wealth, with limited positive livelihood outcomes for displaced farming and fishing communities." Land Matrix (2016) reports a net employment loss in which there was "large-scale crowding out of smallholders and low prevalence of contract farming schemes" because investors prefer to recruit migratory laborers who are not likely to resist evictions. Per 100 hectares, Asian oil palm and sugarcane plantations generate ten jobs, eucalyptus two jobs, and soybeans only 0.5 job (Li 2011). After investor land conversion, smallholder livelihoods were threatened, as their previous croplands and diverse uses of forests and waterways were displaced by new investor land uses (Gironde et al. 2016: 172; Pye 2017). In Indonesia, only about 27 percent of investor lands were allocated to smallholder plots, and many of the parcels were too small to cultivate oil palm (OXFAM 2011a).

Throughout South Asia, investor agendas have displaced peasant and indigenous food producers. Inequality of land control has widened significantly,

37 For example, 59 energy firms and institutions made a 2007 commitment to invest $12.4 billion in biofuel development in Indonesia. In return, the Indonesian government earmarked 6.5 million hectares by 2025 of "idle land" for biofuel related crops, half allocated for oil palm (McCarthy 2010: 833). Similar goals and commitments have been made by the Philippine, Malaysian and Cambodian governments (Borras and Franco 2011; Pearce 2012; Marks et al. 2015; Gironde et al. 2016).

38 Analysis of International Trade Centre data.

and new class and ethnic bifurcations have emerged among peasants. On the one hand, the percentage of marginal farmers with parcels too small for production beyond household requirements has more than doubled. On the other hand, a new small class of entrepreneurial smallholders "is emerging that, together with domestic investors, is deriving a lucrative livelihood from boom crops, such as oil palm and cocoa. As these emergent 'progressive farmers' buy up surrounding areas of land, their prosperity is linked with problems of agrarian differentiation and dispossession" (McCarthy et al. 2012: 526). Peasant fishers have been negatively impacted by land deals through displacement of their communities, elimination of fishing rights by investors, diversion of inland waterways into irrigation systems and large fishponds, and pollution of river and coastal waterways that kills fish (Bavinck et al. 2017; Bues and Theesfeld 2012).

3 Conclusion

According to the United Nations Human Rights Council, Asian states and judiciaries "are unwilling or unable to regulate the conduct of private enterprises and fail to provide redress for violations committed by private enterprises" (United Nations 2014: 13). Consequently, Asian states and judiciaries are ineffective at investigating and/or settling land disputes that involve smallholders or customary land rights. Land grabs in the Asian fisheries "are facilitated and legitimized by the rules that govern the acquisition of land use rights mainly because they reside in a tangle of overlapping, opaque and often contradictory laws which allow huge, unbridled discretionary powers to decision makers, and create an environment conducive to coercion, corruption, cronyism, violence and graft" (Carter and Harding 2015: 101). In 2019, for example, 800 land conflicts involving 107,600 evictees were bogged down in Indian courts and still had not been settled in late 2021. Because of international criticism of violence toward vulnerable groups, the Bangladesh government announced in 2020 that it would crack down on such land grabs by elites with corrupt political ties.[39] However, international NGOs and media continued to report such assaults throughout 2021. In reality, each of the Asian states (except Japan) has manipulated land laws, often acting illegally or employing military violence, to pursue national development and infrastructure goals in the early 21st century.

39 *The Economist*, 17 Oct. 20, pp. 55–56).

Those widespread acts of *institutionalized state expropriation* (Ong 2018; Oakland Institute 2019) have resulted in:

1. the abandonment of national land redistribution programs that would address landlessness;[40]
2. increased land grabbing resulting in concentration of land ownership into the hands of domestic large land owners and of foreign land concessionaires;
3. an economic/political culture in which domestic legal systems encourage and tolerate "land expropriation violence" (Sargeson 2013) to effect illegal elite confiscations of small peasant farms and fisheries and evictions of vulnerable indigenous communities;
4. widespread dispossession of peasant farmers and fishers, small community fishponds, and indigenous agricultural communities;
5. widespread dispossession of landless farmers and fishers from peri-urban areas where untitled lands are regularly impacted by flooding or sea level rises and
6. "reorganization of land control, rights and access in ways that perpetuate and intensify waves of eviction and exclusion of small landholders and landless laborers, thus threatening agriculture-based rural livelihoods" (Mahmud et al. 2020: 17).[41]

Evictions have left a two-decade trail of human rights violations and military actions against unarmed citizens that have repeatedly drawn international criticism, such as the 2017 expulsion of 1.3 million Rohingya by the Myanmar military (Amnesty International 2018). In 2020, there were more than 1.4 million internally displaced Asians in camps operated by international aid organizations (see Table 18), a majority of them evicted from lands by their own states. Land tenure remains insecure for most of the populations in the Asian fisheries, especially for peasant farmers and fishers and indigenous communities who most often do not hold legal titles to the lands on which they pursue their livelihoods. Furthermore, large land concessions to investors have rarely generated new livelihood opportunities for evicted communities (Neef 2016). In Cambodia, for instance, 800,000 people have been impacted by state

40 Even though a number of Asian countries have, in the past, initiated national land registration and titling programs to benefit smallholders, Vietnam is the only one to fully implement such a program (Neef 2016). For assessment of the anti-peasant outcomes of Philippine agrarian reform, see Carranza and Mato (2006), Borras (2007), and Borras et al. (2007).

41 Neef (2016); Quizon (2013); Beban and Gorman (2017); Feldman and Geisler (2012); Sargeson (2013); Chao and Colchester (2013); Kapaeeng Foundation (2016); Mahmud et al. (2020); Mondal (2021).

evictions since 2000 (Hak et al. 2018). One million Indians (many of them indigenous and tribal peoples) farm, hunt and fish without legal land rights across 657 protected forests, composed of 99 national parks, 513 wildlife sanctuaries, 41 conservation reserves and four community reserves. At least 100,000 people have been displaced from protected areas, and 80 villages have been relocated to create tiger reserves (Neef 2021: 132–133). Moreover, land concessions for palm oil plantations could destroy 98 percent of India's rainforests, heavily impacting tribal peoples (Pearce 2012).

In order to effect large-scale land acquisitions for export development agendas, infrastructure, Special Economic Zones, and tourism (see Table 19), Asian states have displaced hundreds of thousands of peasant farmers and fishers and indigenous peoples, often using military or police violence (Hak et al. 2018; Rousseau 2020). Asian lands that have been targeted for large investor concessions have not been idle or unpopulated, as depicted by governments, but have been actively cultivated by people who are marginalized by their own states (Gironde et al. 2016: 137). Typically, poor peasant farmers or fishers without formal land titles occupy the lands sold in such transactions (Robertson and Andersen 2010). Rural Asians who were previously viewed as rightful custodians of land have become "illegal squatters" as state public land is rezoned to attract domestic and foreign investors or for infrastructure projects. "People now face fines, arrests or state-sanctioned violence for performing everyday livelihood and food provisioning practices on communal forest land. Community protests against enclosure are met with repression from local authorities, supported by national laws that lend legitimacy to the state's privatization of common resources" (Beban and Martignoni 2021: 1). However, the post-2008 global land grab refocused the attention of international organizations (e.g., Oakland Institute 2019, 2020, 2021; Land Matrix 2016; OXFAM 2011a, 2012, 2013) to threats to peasant and indigenous farmers whose lands are targeted for concessions to private investors. While incidents are almost daily reported by international media and NGOs, that global coverage results because displaced people organize to resist eviction, often with support from international NGOs and the United Nations.[42]

42 Many of these post-2000 peasant land struggles have been documented by the *Journal of Peasant Studies*, Amnesty International, Human Rights Watch, the United Nations Human Rights Council and several international land rights organizations. For sample case studies, see Karen Human Rights Group (2012); Neef (2016); Rights and Resources Initiative (2021); Kohli et al. (2018); Amnesty International (2018); Carter and Harding (2015); Tamayo (2019).

One indicator of the worsening conditions is the extent of community resistance and formation of new socio-political groups. In almost every country where land deals have occurred, local peasants and indigenous groups have engaged in public protests and/or lawsuits (OXFAM 2011b; Bavinck et al. 2017). For instance, local resistance movements forced cancellation of land deals with Saudi Arabia for 500,000 Indonesian hectares and with China for 1.2 million Philippine hectares (FAO 2009a). In addition, an array of international organizations have focused significant attention on the impacts of land grabbing on vulnerable communities and indigenous peoples (Gironde et al. 2016: 231–292). Numerous international NGOs published online and media campaigns to build public awareness and to bring political pressure to bear on key policy-making bodies. More than 800 of the world's leading environment and development NGOs and grassroots groups petitioned the United Nations to intervene to protect the affected communities (*The Guardian* 2011). Other than setting up camps for internally displaced persons, neither the United Nations nor any other international development organization has intervened to protect the peasants, ethnic minorities, and indigenous peoples from the human rights violations that have occurred during national and international land grabbing. On the ground in the Asian fisheries, peasant resistance has sometimes stalled evictions within countries. However, a majority of evicted peasants have not been represented by organized movements, and resistance actions have more often failed than won. We agree with Philip McMichael (2006: 408) that the future of Asian peasants "depends on the peasantry itself." If there is going to be a 21st century "politicised movement on a world scale to confront the international power, and socioecological impact of global capital," such a powerful regional peasant resistance movement has not yet been publicly evident.

CHAPTER 8

Propping Up the World Food System

The Future of Hungry Asian Farmers and Fishers

Abstract

We provide an assessment of Asian food security in the 21st century, followed by an examination of the centrality of peasant farmers and fishers to food production. We explore urbanization and debt bondage as threats to the persistence of Asian peasants, concluding with the question of whether Asian peasants are likely to persist into the 21st century.

> The world is not on track to eradicate hunger, food insecurity and malnutrition by 2030.
>
> (Food and Agriculture Organization 2021c)

• • •

> One of the enduring agrarian puzzles has been the persistence of the Asian smallholder.
>
> (JONATHAN RIGG et al. 2018: 327)

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In Greek mythology, the Titan Atlas shouldered the heavens as punishment mandated by Zeus. In the 21st century, hungry Asian farmers and fishers play the Titan role of propping up the capitalist world food system. Like Atlas, they receive few rewards for their contributions. Instead, their survival is threatened by the highest incidence of hunger and malnutrition in the world, land evictions, debt bondage, and a higher vulnerability to the impacts of climate change. The central question of our study has been: *Why are the Asian peasants who produce and export so much of the world's food the hungriest people on Earth?* The sixteen Asian fisheries produce more than three-quarters of the world's fish and nearly half of total world food output (ADB 2013). They account for a majority of the world's wild seafood outputs and more than two-thirds of

aquaculture production (FAO 2012e). Consequently, they export nearly one-third of globally traded fishery commodities, and most of them rank among the top fifty fishery exporters. Populated by two-thirds of the world's hungry people (see Figure 1), East, South and Southeast Asia are a world hunger paradox. Since 2000, neither economic growth nor increased food and fishery production (see Table 2) have been sufficient to solve hunger and malnutrition in the sixteen Asian fisheries. Through integration of their natural resources, their laborers and their agricultural/fishing outputs into the world food system, the Asian fisheries have been transformed into *food extractive enclaves*. The world food system is nutritionally bifurcated, grounded in insufficient resources and underconsumption for the hungriest producing zones and privileged overconsumption in the least hungry, richer zones that devour the most nutritiously valuable foods. Even though rural hunger and malnutrition have increased disproportionately, thirteen of these Asian fisheries systemically engage in *nutritional unequal exchanges* in which they trade internationally their most nutritious fishery commodities for less nutritious imports (see Tables 6 and 7). Indeed, these fisheries trade down nutritionally in two ways. On the one hand, they export high-nutrition fishery commodities from their zones of high malnutrition to zones of the world that suffer little hunger (see Table 5). On the other hand, food security is further threatened by the reallocation of lands and waterways into the production of nonfoods for export (see Tables 3, 10 and 19).

Worldwide, Asian fishery imports are "cheap" because fishing households, especially the women in them, provide hidden, unpaid subsidies to export commodity chains through their unpaid and low-paid labors and through their absorption of externalized ecological and community costs (see Figure 20). As Asian peasant fishers and farmers have become increasingly enmeshed in debt bondage and contract farming, women's work roles have changed and expanded in ways that threaten household survival (see Chapter 6). Wives and daughters work longer hours than males, take on "men's work" as needed, and often earn more cash than males. However, these females are disproportionately impacted by hunger, micronutrient shortfalls, and nutrition-related diseases while they are also carry the primary burden for feeding their children (see Chapter 5). In this chapter, we will explore five questions:

1. What are the projections for Asian food security?
2. What are the contributions of peasant farmers and fishers to Asian food security?
3. Does urbanization spell the end to Asian peasants?
4. How does debt bondage impact peasant persistence?
5. Are Asian peasant farmers and fishers likely to persist into the 21st century?

1 Looking toward the Future of Asian Food Insecurity

Despite the high regional incidence of nutritional shortfalls and hunger-related illnesses (see Table 2), none of the Asian fisheries has a systematic national food security policy. While these states have prioritized other development goals in the early 21st century (see Chapters 2, 3 and 7), they have not focused on national food security. As we saw in Chapter 7, the Asian fisheries have engaged in massive land expropriations for national development goals and infrastructure construction since 2000. While prioritizing dams, Special Economic Zones, coal-fired power plants, tourism complexes, and elite housing, these state land concessions to investors have only targeted agriculture when it has afforded expansion of *nonfood exports* for which there is high global demand (especially rubber, palm oil, biofuels, paper pulp). While failing to prioritize national food security in its land expropriations from citizens, the Asian states have also disproportionately displaced rice and food croplands and evicted peasant and indigenous farmers and fishers, further endangering domestic food security.

The High Level Panel of Experts on Food Security and Nutrition (2011: 11, 33) recommends that "governments should prioritize investment in the small farm sector... and should encourage business models that involve collaborating with them." The Panel made that recommendation because national budgets of a majority of countries do not prioritize agriculture. Globally, agriculture produces nearly twice as much in terms of economic value as this sector receives in public financial support (FAO 2021b). In 2015, Southeast Asian agriculture contributed 16 percent of GDP while being allocated less than 4 percent of public budgets. South Asian agriculture received less than 7 percent of public funds even though the sector contributed nearly 16 percent of GDP value. East Asian agriculture fared somewhat better, with only a 2 percent difference between GDP value and national funding (see Table 20). In a recent report advocating transformation of public support of agriculture, the United Nations Development Program (2021: 14) contends that little of current public funding reaches peasant farmers and fishers, and little of any increases will reach them in the future, without significant policy changes worldwide. Indeed, "87% of current support to agricultural producers, approximately $540 billion per year, include measures that are often inefficient, inequitable, distort food prices, hurt people's health, and degrade the environment." Moreover, most of the public funding aims at specific commodities that are in high global demand, subsidies to maintain artificial trade prices for specific commodities, or subsidies to consumers. We doubt that we need to point out the obvious, but we will. Asian peasant farmers and fishers do not presently receive much in the way of public funding, yet they persist, most of them struggling in poverty.

TABLE 20 Status of agricultural expenditures in national budgets, 2015

Country	Agriculture as % GDP	% national budget spent on agriculture
Part A. South Asia		
Bangladesh	14.8	7.8
India	16.2	8.9
Pakistan	23.8	0.6
Sri Lanka	8.2	6.3
Subregional Averages	16.1	6.8
Part B. Southeast Asia		
Cambodia	26.6	NA
Indonesia	13.5	3.1
Malaysia	8.3	3.1
Myanmar	26.7	6.1
Philippines	10.3	4.1
Thailand	8.9	7.7
Vietnam	17.0	NA
Subregional Averages	15.9	3.8
Part C. East Asia		
China-Mainland	8.5	5.0
Japan	1.1	NA
North Korea	21.6	NA
South Korea	2.0	4.1
Subregional Averages	8.4	6.4

SOURCE: ANALYSIS OF COUNTRY DATA IN FAOSTAT. SUBREGIONAL DATA ARE FROM FAO (2021B: 4). NA = NATIONAL BUDGET DATA NOT AVAILABLE FOR CAMBODIA, JAPAN, NORTH KOREA, TAIWAN, VIETNAM

The lack of national food security programs is reflected in the statistics for daily food supply and hunger incidence. Despite high levels of food production and economic growth rates of 5 to 8 percent over the last two decades, these major fishery exporters have shown little change in their hunger indexes over the last decade (see Table 21). Indeed a majority of these Asians reside in countries that

TABLE 21 Two-decades of alarming to moderate global hunger indexes, 2000–2019

Asian fishery	2000–2010 index	2010–2019 index	2017 % above or below world average of 2,884 calories per capita daily food supply
Part A. No change in the index over the period			
China-Mainland	Moderate	Moderate	9.2% Above
[a]Indonesia	Serious	Serious	2.4% Below
Malaysia	Moderate	Moderate	1.9 % Below
Myanmar	Serious	Serious	6.3% Below
[a]North Korea	Serious	Serious	29.5% Below
[a]Philippines	Serious	Serious	7.3% Below
[a]Sri Lanka	Serious	Serious	9.4% Below
Thailand	Moderate	Moderate	4.2% Below
Part B. Index change dependent on national and international child feeding programs			
[a]Bangladesh	Alarming	Serious	10.0% Below
[a]Cambodia	Alarming	Serious	14.30% Below
[a]India	Alarming	Serious	12.7% Below
[a]Pakistan	Alarming	Serious	19.4% Below
Vietnam	Serious	Moderate	4.7% Below
Part C. No change in the index over the period: Low hunger indexes			
Taiwan	Low	Low	3.2% Above
Japan	Low	Low	6.5% Below
South Korea	Low	Low	16.8% Above

a low-income food-deficit country (FAO 2011a)

SOURCE AND NOTES: JAPAN, SOUTH KOREA, AND TAIWAN HAD LOW INDEXES IN BOTH 2000 AND 2019. THE GLOBAL FOOD INDEX IS CALCULATED USING FOUR STATISTICAL INDICATORS: PROPORTION OF THE POPULATION THAT IS UNDERNOURISHED (NOT RECEIVING ADEQUATE FOOD CALORIES), PROPORTIONS OF CHILDREN WASTED OR STUNTED, AND CHILD MORTALITY RATE (CONCERN WORLDWIDE 2010–2019). THE THIRD COLUMN IS DERIVED FROM ANALYSIS OF KCAL PER CAPITA PER DAY FROM FAO FOOD BALANCE SHEETS

have had alarming to moderate hunger indexes since 2000. The hunger indexes of India, Bangladesh, Cambodia, Pakistan and Vietnam have improved slightly over the decade, primarily through child feeding programs that are dependent on international funding. In sharp contrast to these high hunger fisheries, Japan, Taiwan and South Korea have low hunger indexes, in large part because they import nutritious food/fishery resources cheaply from their Asian neighbors. Despite their high fishery production and exports (see Table 1), thirteen of the Asian fisheries have exhibited sharp declines in domestic consumption of mollusks, shellfish and finfish (see Table 4). Even though most of these Asian households spend more than half their budgets on food, regional calories per capita fell between 1995 and 2012 in twelve of the Asian fisheries (FAO 2014b).[1] Between 2000 and 2019, food supply (as expressed by the FAO in calories per capita) fell by 50 percent or more in Cambodia, Myanmar, Sri Lanka, Thailand, and Vietnam and declined by 20 to 25 percent in Bangladesh, Indonesia and Malaysia. While India, North Korea, Pakistan and the Philippines saw short-spurt improvements from national and international child feeding programs, China was the only Asian fishery in which per capita consumption rose.[2]

The Asian Development Bank (2013: 70, 89) delineates two problems that are inherent in existing state policies. On the one hand, states only offer "immediate relief to the poor during temporary bouts of food insecurity," coupled with childhood feeding programs that are usually funded internationally. On the other hand, "national food security strategies have often focused on agriculture and food supply, neglecting the importance of nutrition." It is not surprising that Asian neoliberal states have failed to develop serious food security platforms because international development agencies deter such proactive national agendas by linking project funds, loans and debt repayment to food exporting and nonfood agriculture (SAPRIN 2002). Our examination of trends in the sixteen Asian fisheries points to the dangers of food and fishery exporting and importing (see Tables 3, 5, 6 and 7) because these are profit-oriented strategies of capitalists that are very weakly (if at all) regulated by national policies. Indeed, such state "interference" would be in violation of global and regional trade agreements (SAPRIN 2002).

A decade ago, the Special Rapporteur of the UN Human Rights Commission advocated a new kind of state responsibility for food security. On the one hand, he instructed states that they would, in future, be expected to recognize the "human right" of their citizens to "an adequate diet providing all the

1 Calories per capita have remained static or risen slightly in China, Japan, South Korea and Taiwan.

2 Analysis of country data in FAOSTAT. Per capita consumption declined in Japan.

nutritional elements an individual requires to live a healthy and active life, and the means to access them" (DeSchutter 2011: 9). On the other hand, he did not call to account the controlling agribusinesses and supermarkets of the world food system or the greedy transnational capitalists within states. Instead, he shifted responsibility for ameliorating hunger to the narrow confines of national governments. How exactly can those states "regulate" the world food system without violating restrictions of the World Trade Organization and of past international debt repayment agreements? How exactly can these states insure citizen access to resources (which are often owned by capitalists hundreds of miles away) while also staying committed to the export agendas required by structural adjustment plans to resolve debt (SAPRIN 2002)? And what of the transnational capitalists (Robinson 2004) within countries and within regions who control far more food resources than their governments?

1.1 *The Absence of Asian State Food Security Policy*

While it is hard for any of us to disagree with the philosophy of "food as a human right," such an important goal becomes empty international rhetoric in the face of multiple contradictory layers of neoliberal mandates that have been imposed on Global South states by international development organizations and banks. With respect to food security in the 21st century, international development organizations are now imposing three antithetical mandates on states. First, the World Trade Organization, as well as the proliferation of international and regional trade pacts, require states to eliminate barriers to trade, so that governments do not "interfere" with the actions of capitalist enterprises to produce, process, distribute, export, import and maximize profits from foods. Second, "states have a duty," according to the United Nations, "to protect the right to an adequate diet, in particular by *regulating* the food system, and to fulfill the right to adequate food by proactively strengthening people's access to resources, allowing them to have adequate diets" (DeSchutter 2011: 9). Third, states need to determine how they will comply with contradictory international mandates "to eliminate regulation" and "to create regulation" of the supplies of food within their territories.

1.2 *World Food System Risks Made Visible by COVID-19*

Before the global pandemic, the Food and Agriculture Organization (2019c) reported that progress in reducing global hunger had stalled. Since 2014, the prevalence of moderate or severe food insecurity has been slowly rising globally, and the number of undernourished people steadily increased. By 2018, one of every 3.8 people experienced some form of food insecurity. Then the global COVID-19 pandemic further exacerbated those trends. The 2021 *State of*

Food Security and Nutrition (FAO 2021c) points to the significant impacts of the global COVID-19 pandemic. The prevalence of undernourishment increased 1.5 percent in 2020. In 2020, more than 720 million people faced chronic hunger while 2.37 billion, or nearly one of every three people, did not have access to adequate food. Healthy diets were out of reach for around 3 billion (one of every 2.5 people), especially the poor, in every region of the world. In 2020 and 2021, the pandemic triggered production, distribution and hunger crises that demonstrate the degree to which developing countries are disempowered by the world food system. The global crisis triggered major systemic weaknesses and flaws in the world food system, most particularly in East, South and Southeast Asia.[3] On the *supply side*, the following bottlenecks occurred.

1. Port and airport facilities that handle 90 percent of global commodities were disrupted, resulting in long delays for shipping containers in which foods spoiled or were infested by vermin.
2. Restrictive food trade measures were implemented by 33 countries, hitting East, South and Southeast Asia hardest with export restrictions on rice and wheat.
3. Citizen quarantines led to breakdowns in the supply of workers. Food production came to a halt when local and migrant workers were prevented from traveling to farms, fisheries, processing and packaging facilities.
4. Imports of seeds, seed fish, fertilizers, pesticides, machinery and technology ceased or suffered long delays, preventing crop and aquaculture outputs.
5. These systemic breakdowns triggered price increases for foods, food packaging, and agricultural inputs by as much as 20 to 50 percent.
6. Domestically, the prices of fresh produce and fish declined due to oversupply in warehouses and processing centers. Restaurant closures exacerbated this problem, resulting in unsold crops and fish catches. Informal sector workers (who already experienced the highest incidence of hunger) were impacted hardest because peasant farmers and fishers are concentrated in the informal sector.[4]

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3 In its first report on world nutrition after more than a year of globalized COVID-19, the FAO (2021c: 78) pushed aside any consideration of these systemic weaknesses. "While broader agri-food system transformation is of utmost importance, it is beyond the scope of this report." If such a discussion does not belong in these annual FAO reports about recommended policy changes about world food access and nutrition shortfalls, where does it belong?

4 These trends were aggregated from ADB (2020); Breman (2020); FAO (2020a, 2020b, 2020c, 2021c); ILO (2020); IMF (2020); Islam (2020); Janssen (2020); World Bank (2020a, 2020b).

On the *demand side*, the pandemic made clear the dangers inherent in a world food system in which states are heavily dependent upon food imports. Supply disruptions in the world food trade resulted in hunger for many.

1. Job losses led to sharp declines in household income, causing a 60 percent increase in extreme poverty and loss of access to food resources. East, South and Southeast Asia suffered the highest incidence of job loss and subsequent hunger in the world. What, we wonder, happened to fishers and smallholder farmers when they could not meet their debt bondage obligations?
2. To complicate matters, there was a 20 percent decline in remittance flows from migrant laborers, hitting South and Southeast Asia hardest.
3. Closures of schools, NGO and public clinics ended feeding programs for low-income children. Most Asian households could not replace those lost resources, leading to a rise in stunting and anemia among Asian children.
4. A high proportion of highly perishable micronutrient-rich foods and fishery outputs spoiled in local markets, limiting the food resources needed by pregnant and lactating women, children and teenagers.
5. Disruptions in agriculture and fishing disproportionately impacted peasant farmers and fishers, triggering sharp rises in rural poverty and rural hunger.
6. In addition to disruption of food flows to communities, there were even worse supply disruptions to Asian refugee camps.[5]

According to the Center for Strategic and International Studies, North Korea was probably the country hardest hit by shortfalls caused by the COVID pandemic.

> The total domestic consumption of agricultural products, particularly cereals, soybeans, and potatoes, structurally exceeds the domestic production volume in North Korea. As a result, the country heavily depends on commercial imports from China to fill the gap. Unfortunately, the chances of closing this food gap through increased trade and imports were low due to a border shutdown to trade since January 2020 due to COVID19. ... The domestically available crops, combined with the officially planned commercial imports, still left a food gap of approximately 860,000 tons –equivalent to roughly 2.3 months of food use.[6]

5 These trends were aggregated from ADB (2020); Bremen (2020); FAO (2020a, 2020b, 2020c, 2021c); ILO (2020); IMF (2020); Islam (2020); Janssen (2020); World Bank (2020a, 2020b).

6 https://www.csis.org/analysis/assessingfall2021agriculturalconditionsnorthkorea (accessed 19 Jan. 2022).

In the face of the oligopolistic world food system, the 2011 UN human right to food (DeSchutter 2011) was ineffectual during this pandemic because it limited responsibility for hunger to states that had neither political will nor control over food resources. Due to global breakdowns in production and distribution and to local job losses, the prevalence of hunger rose nearly 10 percent within six months after start of the global pandemic. Over the next year, two-thirds of those newly undernourished people were concentrated in the major fisheries of East, South and Southeast Asia (FAO 2021c; ADB 2020).

2 Peasant Contributions to Asian Food Security

Accumulated scholarship emphasizes that smallholder agricultural systems contribute significant food calories for local consumption and for global trade. Peasant farmers

> with less than five hectares of agricultural land per farming household, account for a significant portion of global production of many crops, contributing more than 80% of global rice production, 75% of global production of groundnuts and oil palm, nearly 60% of global production of millet and cassava, and more than 40% of production of sugarcane. ... Including 41 crops, accounting for more than 90% of global calorie production... smallholder farming... is responsible for 41% of total global calorie production, and 53% of the global production of food calories for human consumption. Units with less than five hectares of agricultural land per farming household contribute 70% of food calories produced. (Samberg et al. 2016: 5)

The Food and Agriculture Organization (2013, 2021d) emphasizes that Asian peasants produce diversified agricultural surpluses, that they are essential to domestic food security, and that they generate a disproportionate share of the commodities that circulate in the world food system (cf. also Quizon 2013; Samberg et al. 2016; Harrero et al. 2017; Lowder et al. 2021). In the Asian fisheries, small and very small farms produce 35 to 50 percent of global food calories and 50 to 70 percent of local food calories (Lowder et al. 2016; Samberg et al. 2016; Harrero 2017). In most of the Asian fisheries, "smallholders contribute a significant amount to the total value of agricultural output. In the case of India, for example, smallholders contribute over 50% of the country's total farm output although they cultivate only 44% of the land. In many Asian countries, smallholders are the main producers of staples such as rice, corn,

root crops, and pulses, thus highlighting their important contributions to food security" (Quizon 2013: 51).

Asian peasant farmers produce more than 75 percent of most food commodities, including a majority of vegetables, roots and tubers, pulses, fruits, fish, livestock and rice (Harrero et al. 2017). Asian subnational food security is heavily dependent on peasant farms that are smaller than two hectares. There is an inverse relationship between farm size and productivity, *i.e.* small farms are more productive per hectare than large farms (Quizon 2013; Samberg et al. 2016; Harrero et al. 2017; FAO 2021d; Lowder et al. 2021). More of the crop production of small peasant farms is marketed locally (our Philippine field research; Harrero et al. 2017). The food outputs of small peasant farms are more affordable locally than the outputs of farms oriented to production for global commodity chains (Samberg et al. 2016; Harrero et al. 2017; our Philippine field research). The food outputs of small peasant farms are more nutritiously diverse than those produced by local larger firms that specialize in crops for export (Samberg et al. 2016; Harrero et al. 2017; our Philippine field research). Moreover, imported foods overcome few of the nutritional shortfalls of Asian farming households (see Table 6). In local markets, peasant crop outputs are routinely traded directly for locally captured fish (our Philippine field research; Philippine Annual Fisheries Profile 1977–2019; Pomeroy et al. 2009; Siason 2001; Turgo 2015; Wang 2004). Furthermore, peasant farms serve as conservators of genetic diversity of food crops because they cultivate a wider variety of crops that, in turn, increase their resilience against pests, diseases, droughts, and other stresses (Quizon 2013: 52; Harrero et al. 2017: 36). In addition, small peasant farms and networks collect, preserve and trade seeds of foods, especially vegetables and tubers, that are part of indigenous diets (Bates et al. 2011; Bicksler et al. 2012; La Via Campesina. 2015).[7] In short, the shift to capitalist monocultural agriculture has yielded more quantity but less food diversity and a reduction in the indigenous sources of nutrients in Asian diets, a point that we emphasized in Chapter 1.

Because of their production, international development organizations have shifted their policy about peasant fishers to one that values their contribution

7 Farm-saved seeds and informal exchanges contribute as much as 70 to 90 percent of the total seed supply of small Asian peasant farms (Shiva 2000, 2016). Asian activist groups battle corporate biopiracy in which multinational agribusinesses seek to prevent indigenous seed collection and community seed banks. See La Via Campesina (2015), the Asian Farmers' Association for Sustainable Rural Development (https://asianfarmers.org/afa/, accessed 26 Jan. 2022), Vrihi, a folk rice seed bank for farmers (http://cintdis.org/vrihi/, accessed 26 Jan. 2022) and Vandana Shiva's organization (https://www.navdanya.org/site/livingseed/navdanyaseedbankshttps://www.navdanya.org/site/ (accessed 26 Jan. 2022).

to the world food system (e.g., Siar and Kusakabe 2020). More than 90 percent of the world's fishers are small-scale operators, and 73 percent of them are concentrated in Asia. Globally, their annual catches account for half of world production, valued at $45 billion.[8] Moreover, peasant fishers capture more than half the catch in developing countries, and a higher proportion of their outputs are consumed domestically than is the case for commercial fishers and aquaculture (World Bank 2012: xviii, 22). Marking an historical turning point in 2014, the Food and Agriculture Organization developed and advocated new guidelines for sustainable smallscale fisheries. Between 2016 and 2018, several major international conferences have promoted a human rights approach to small scale fishers.

Acknowledging that "small scale fisheries have not been given due attention," the Food and Agriculture Organization launched in 2020 a new project to develop a global inventory of small-scale marine and inland fisheries in developing countries. Their website draws attention to contributions of peasant fishers.

> Around 90% of the 35 million people recorded globally as fishers are classified as smallscale, and a further 20 million people are estimated to be involved in the smallscale postharvest sector. In addition, there are millions of other rural dwellers involved in seasonal or occasional fishing activities that are not recorded as "fishers" in official statistics. Women are heavily involved in processing and trade of fish and fish products from smallscale fisheries. When numbers of fishers and fish workers are combined with those involved in activities supplying inputs to fishing and postharvest activities and their household dependents, it is likely that more than 200 million people worldwide depend in some part on smallscale fisheries for their livelihood. These people include many millions who live in remote rural areas, especially in Asia and Africa, where there are few alternative sources of income and employment offering significant potential to contribute to livelihood strategies. (FAO 2019c: 1)

The 4th World Small-Scale Fisheries Congress convened in 2022, and the United Nations declared 2022 the International Year of Artisanal Fisheries and Aquaculture.

8 Throughout this chapter, monetary values are expressed as $US.

3 Will There Be an Historical Transition to Large Asian Farms?

About three years into the post-2008 global land grabbing (see Chapter 7), the Oakland Institute (2011) drew attention to the pivotal role of the World Bank in causing land investments in developing countries through (a) direct financing of agribusiness firms which amounted to $3.9 billion to 125 projects in 51 countries; (b) assistance to governments to develop land laws friendly to foreign investors interested in large tracts; (c) encouraging governments to offer tax holidays and other subsidies to investors and (d) "working in multiple capacities to foment the influx of private equity into agricultural land worldwide." OXFAM (2012) challenged the World Bank to "put its house in order" by "freezing its investments in large-scale land acquisitions." Between 2002 and 2012, Bank investments in agriculture tripled to nearly $8 billion. From 2008 to 2012, formal complaints were lodged by 21 communities whose land rights had been violated by investors funded by the Bank. The year before the global land grabbing began, the World Bank published its economic philosophy about large land acquisitions in its *World Development Report 2008* in which the plan for "a new agriculture for development" reads like a prediction of the pressures toward depeasantization that resulted from the land grabbing frenzy.

Pointing to "looming land constraints," the World Bank (2007: 9, 26, 58, 61, 78, 83, 89, 91, 92, 132, 138, 142) called for "new investments to speed productivity growth" and significant state policy changes to make land market sales more viable, noting that "well-functioning land markets are needed to transfer land to the most productive users." The Bank's "new agriculture for development" is to be advanced through integration of some smallholders into commercial agriculture while others will "move beyond the farm" to earn livelihoods from nonfarm labor and/or migration. In the Bank's view, there are two categories of smallholders: (a) entrepreneurial, market oriented peasants and (b) subsistence producers without market linkages, the goal being to displace most of the second type. The report raises concerns that smallholder farms are "too small" for high crop yields, that pastoralists are problematic to land market sales, and that smallholders lack access to credit, insurance, and market linkages. Because smallholder farms "cannot capture economies of scale in production and marketing, labor-intensive commercial farming" will be a "better form of production." The World Bank's "new agriculture" is to be

> led by private entrepreneurs in extensive value chains linking producers to consumers and including many entrepreneurial smallholders. ... The agriculture of staple crops and traditional export commodities finds new markets as it becomes more differentiated to meet changing consumer

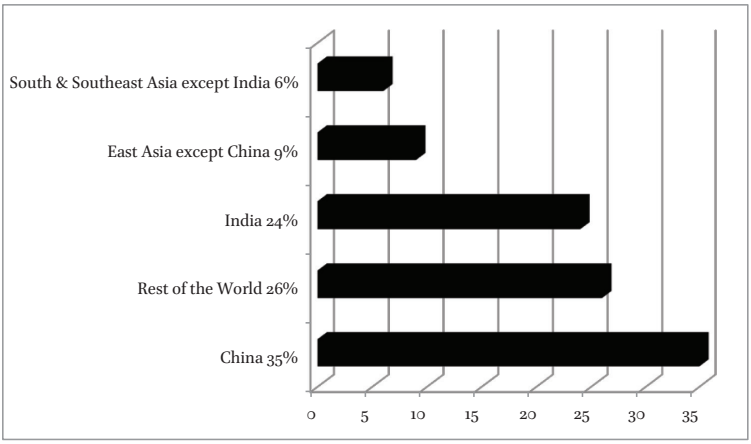
> demands and new uses (for example, biofuels). An emerging vision of agriculture for development redefines the roles of producers, the private sector, and the state. ... The private sector drives the organization of value chains that bring the market to smallholders and commercial farms. The state... engages strategically in public-private partnerships to promote competitiveness in agribusiness. (World Bank 2007: 8)

Furthermore, smallholders are called upon to "decommodify" traditional local staple crops to make room for new "specialty" exports, specifically biofuels, oil seeds, livestock, feeds and horticulture (World Bank 2007: 142).

If fully implemented, the World Bank's (2007) economic philosophy of "the new agriculture" would threaten the survival of Asian peasants for three reasons. First, this approach will trigger even more of the kinds of evictions and displacements, biases against ethnic minorities and indigenous peoples, and human rights violations that we analyzed in Chapter 7. Second, this kind of agricultural approach directly conflicts with the global climate change adaptation goals discussed previously, and these are goals to which the World Bank claims to be committed. Those kinds of conflicts in international development approaches often play out on the ground in developing countries, with externally-funded projects from both perspectives operating simultaneously in communities to cause socio-political disruptions and worsening ecological risks that will attract international criticism. Third, the World Bank "new agriculture" is actually most "new" because it advocates the displacement of "less market-productive" smallholders into nonfarm livelihoods and migration. Indeed, the World Bank (2007) advocates the transformation of a high proportion of the world's peasantry and smallholders into nonfarm laborers to make room for farmers who integrate themselves into production of exports for global value chains. That degree of extreme depeasantization is unlikely for three reasons. First, there simply are not enough nonagricultural options, other than unreliable urban informal sector activities that keep people poor. Second, Asian peasant farmers are strong enough in numbers (see Table 24) to resist strenuously. Third, other international organizations have organized agendas to strengthen smallholder farming in the 21st century.

Is this historical transition to depeasantization and large Asian farms likely to occur? Asian peasant farmers are "persisting in the face of deep socioeconomic transformation" (Rigg et al. 2018: 327). Especially in Asia, the World Bank (2007: 17) claims, "the reallocation of labor out of agriculture is lagging." Even in the neoliberal age when peasant farmers and fishers have been integrated into the global commodity chains of the world food system, the "natural economic transition towards larger farms" that has been predicted by western

Part A. Where are the world's farms located?



Part B. Size distribution of the world's farms

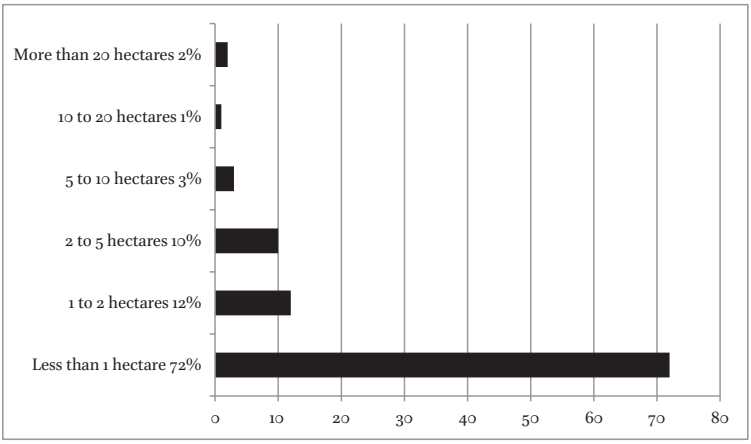


FIGURE 30 Status of the world's farms, 2010
SOURCES: FAO (2013); LOWDER ET AL. (2016)

scholars and advocated by international development organizations (e.g., World Bank 2007) has not happened in the Asian fisheries, not even in Japan (see Table 22; Lowder et al. 2016).

> One of the enduring agrarian puzzles... has been the persistence of the Asian smallholder. ... We have seen Asian countries make the transition from low income to middle income, lower-middle income to upper-middle income, and even to high income. The share of agriculture in GDP has dropped markedly.... But we have not seen the farm size transition

> take hold. Rather than the number of farms declining and their average size growing, as experience of and theory from the Global North might lead us to expect, the reverse is occurring: the number of farms is often growing and their average size declining. (Rigg et al. 2018: 327)

In 2010, nearly three-quarters of the world's farms were situated in East, South and Southeast Asia (see Figure 30), and a majority of them were operated by peasant smallholders (see Table 22).

The World Bank's "new agriculture" policy is unrealistic because the world's typical farm is operated on less than one hectare, with 84 percent of farms averaging less than 2 hectares. In most of the Asian fisheries, including Japan,

TABLE 22 Farm size and land distribution in the major Asian fisheries, 2010–2015

Country	Average farm size in hectares	% farms less than 1 hectare	% farms 1 to 3 hectares	% farms larger than 3 hectares	% land in farms less than 1 hectare	% land in farms 1 to 3 hectares	% land in farms larger than 3 hectares
Bangladesh	0.6	84.4	14.1	1.5	50.2	37.5	12.3
Cambodia	1.6	46.4	45.3	8.3	12.9	48.2	38.9
China	0.6	NC	NC	NC	NC	NC	NC
India	1.1	61.7	21.0	11.9	22.5	36.5	41.0
Indonesia	0.5	74.0	20.0	6.0	NC	NC	NC
Japan	2.5	NC	NC	NC	NC	NC	NC
Myanmar	2.6	29.4	50.5	20.1	7.8	47.9	44.3
Pakistan	2.6	NC	NC	NC	7.9	40.1	52.0
Philippines	1.3	56.8	32.0	11.2	12.0	35.6	52.4
South Korea	1.2	53.9	18.0	28.1	24.5	32.0	43.5
Sri Lanka	0.5	92.7	6.5	0.8	NC	NC	NC
Thailand	3.1	23.3	41.0	35.7	3.4	23.7	72.9
Vietnam	0.7	76.1	18.2	5.7	35.6	50.1	14.3

SOURCE: ANALYSIS OF COUNTRY DATA IN "MAIN RESULTS AND METADATA BY COUNTRY (2006–2015)," WORLD PROGRAMME FOR THE CENSUS OF AGRICULTURE 2010, HTTPS://WWW.FAO.ORG/3/CA6956EN/CA6956EN.PDF (ACCESSED 19 JAN. 2022). INDIA'S NATIONAL CENSUS IS BIASED TOWARD LAND OWNERS, IGNORING INDIGENOUS AND LANDLESS FARM OPERATORS. CONSEQUENTLY, THE AVERAGE FARM SIZE IS MOST LIKELY SMALLER THAN THE CENSUS REPORTS. JAPAN, MALAYSIA AND NORTH KOREA DID NOT CONDUCT CENSUSES. NC = DATA NOT COLLECTED BY THE NATIONAL CENSUS. NA = DATA NOT AVAILABLE

agriculture is dominated by smallholders who depend largely on household labour and have less than two hectares of crop land (see Table 22). While the number of farmers increased between 1960 and 2008 in all countries except Malaysia, Thailand and Japan, total cropland and average farm size have steadily declined in all the Asian fisheries (see Table 23). In 2019, the total population employed in agriculture ranged from little more than one-fifth in East Asia (below the world average of 26.7 percent) to nearly one-third in Southeast Asia and nearly two-fifths in South Asia. Furthermore, Japan is the only country in which farms have introduced a high level of mechanization, indicating the degree to which these smallholders depend on human laborers. The accumulated literature indicates that average farm size globally "has decreased in the developing countries and increased in the developed world" while "farmland distribution is more unequal in high-income countries than in developing regions" (Lowder et al. 2016: 18).

Even though a majority of Asian farmers are smallholders, they control a minority of the land area. The worst land concentration has occurred in Japan, Sri Lanka and Thailand. Even though more than 91 percent of Japanese farms are smaller than 5 hectares, they occupy little more than two-fifths of all farm land. More than 82 percent of Sri Lanka's farms are smaller than 0.1 hectare, but that majority of farms encompass less than 10 percent of the country's farm lands (see Table 23). While little more than one-third of Thai farms are larger than three hectares, those larger farms control nearly three-quarters of the total land. The average farm size in Bangladesh is 0.6 hectare, but farms larger than one hectare encompass nearly half the farm land. The average Philippine farm is 1.3 hectare, but farms larger than two hectares hold more than three-quarters of the total land. Even in Vietnam where the average farm size is 0.7 hectare because of government land redistribution, two-thirds of the farm land is concentrated in farms larger than one hectare.

Second, the World Bank shifted away from its "new agriculture" policy to the following pro-peasant position after the post-2008 international land grabbing described in Chapter 7.

> Smallholder productivity is essential for reducing poverty and hunger, and more and better investment in agricultural technology, infrastructure, and market access for poor farmers is urgently needed. When done right, larger-scale farming systems can also have a place as one of many tools to promote sustainable agricultural and rural development, and can directly support smallholder productivity. ... However, recent press and other reports about actual or proposed large farmland acquisition by big

TABLE 23 Status of farms, farmers, cropland and farm mechanization, 1960–2019

Country	Change in farm size, 1960–2019	% cropland decline, 1960–2011	% increase or (decline) in No. farmers, 1990–2008	% population employed in agriculture, 2019	% farms that use any form of mechanized technology, 2019
Part A. South Asia					
Bangladesh	decrease	43.3	5.3	38.3	37.6
India	decrease	31.0	26.2	42.6	44.2
Pakistan	decrease	35.9	55.3	36.9	73.1
Sri Lanka	decrease	8.7	9.2	25.0	12.8
Subregional Totals	decrease	30.2	24.7	38.0	42.4
Part B. Southeast Asia					
Cambodia	increase	32.8	26.2	34.5	34.0
Indonesia	decrease	14.7	15.9	28.5	NA
Malaysia	decrease	32.9	(14.6)	10.3	NA
Myanmar	increase	9.3	28.3	48.9	2.2
Philippines	decrease	35.8	21.4	22.9	NA
Thailand	decrease	23.3	(9.3)	31.4	40.1
Vietnam	increase	8.5	31.0	37.2	NA
Subregional Totals	decrease	26.2	14.2	30.5	25.4
Part C. East Asia					
China-Mainland	decrease	26.3	5.5	24.9	NA
Japan	increase	13.7	(64.9)	5.1	75.5
North Korea	decrease	17.4	NA	43.8	NA
South Korea	decrease	34.2	NA	5.2	24.9
Subregional Totals	decrease	24.1	5.1	21.5	NA

SOURCE: ANALYSIS OF COUNTRY DATA IN FAOSTAT, FAO (2021C, 2021D) AND "MAIN RESULTS AND METADATA BY COUNTRY (2006–2015),"WORLD PROGRAMME FOR THE CENSUS OF AGRICULTURE 2010," HTTPS://WWW.FAO.ORG/3/CA6956EN/CA6956EN.PDF (ACCESSED 19 JAN. 2022). NA = DATA NOT AVAILABLE. 2010 FAO DID NOT REPORT FARM CENSUS DATA FOR TAIWAN

> investors have raised serious concerns about the danger of neglecting local rights and other problems. They have also raised questions about the extent to which such transactions can provide longterm benefits to local populations and contribute to poverty reduction and sustainable development. (Deininger et al. 2011: XIII)

Third, international development organizations and NGOs emphasize the centrality of peasant farms to world food security. The United Nations has declared 2019 to 2028 the decade of smallholder farming, and the Food and Agriculture Organization has initiated World Agriculture Watch to develop information systems for smallholders.[9] The United Nations and the Food and Agriculture Organization (2014a: 4) emphasize that "responsible international investments" must incorporate "smallholders, including those that are small-scale producers and processors, pastoralists, artisans, fishers, communities closely dependent on forests, indigenous peoples, and agricultural workers." There are two problems with this lofty policy statement. On the one hand, significant international funding has not addressed the needs of the enumerated groups which form a majority of Asian peasant farmers. On the other hand, the historical reality is that most of the international funding to countries focuses on the integration of agricultural producers into cultivation and marketing of globalized commodities, and those projects have prioritized food crops for export or the transfer of traditional local foods, like cassava, into global nonfood commodity chains (see Chapters 1, 4 and 7). Furthermore, our analysis of current land grabbing in the Asian fisheries points to national policies that displace, rather than aid, the types of smallholders enumerated by the FAO.

4 Deruralization, Occupational Multiplicity and Asian Peasant Persistence

In 2020, more than 44 percent of world population resided in rural areas, and 61 percent of those people were concentrated in the sixteen Asian fisheries where more that 47 percent earn their livelihoods in agriculture and fishing. Despite those contemporary trends, the United Nations predicts that two-thirds of the world population will be urbanized by 2050. As Table 24 shows, ten of the Asian fisheries are "expected" to lose one-fifth or more of their rural populations over the next three decades. This degree of urbanization does

9 https://www.fao.org/publications/card/en/c/CA4672EN/ and https://www.fao.org/world-agriculture-watch (accessed 21 Jan. 2022). To date, there are information system projects in Cambodia, Indonesia, Japan, the Philippines and Vietnam.

not seem possible when we consider the sheer numbers. In 2020, two-thirds of South Asians, half of Southeast Asians and 35 percent of East Asians are rural (see Table 24). For the predicted urbanization to occur this rapidly, nearly 2.1 billion people will either have to migrate to cities, form peri-urban zones

TABLE 24 Changes in rural population in the major Asian fisheries, 2000–2050

Asian territory	2020 actual number	2020 % total population	2000 to 2020 actual % increase of (decline)	2020 to 2050 projected increase of (decline)	2050 projected number
Part A. South Asia					
Bangladesh	104,960,000	61.8	4.4	(20.0)	84,090,000
India	900,099,000	65.1	18.2	(13.1)	782,365,000
Pakistan	130,925,000	62.8	41.0	12.1	146,712,000
Sri Lanka	17,139,000	81.3	10.4	(17.0)	14,218,000
Totals	1,153,123,000	63.4	18.4	(10.9)	1,027,385,000
Part B. Southeast Asia					
Cambodia	12,665,000	75.8	28.0	2.3	12,957,000
Indonesia	118,034,000	43.4	(3.8)	(25.9)	87,446,000
Malaysia	7,507,000	22.8	(14.8)	(29.5)	5,289,000
Myanmar	37,740,000	68.9	12.2	(12.6)	32,967,000
Philippines	57,695,000	52.6	37.3	0.2	57,828,000
Thailand	33,713,000	48.6	(21.9)	(40.8)	19,963,000
Vietnam	61,633,000	62.7	1.5	(20.6)	48,918,000
Totals	328,987,000	50.0	5.5	(19.3)	265,368,000
Part C. East Asia					
China-Mainland	549,472,000	38.6	(33.2)	(50.4)	272,509,000
China-Taiwan	5,016,000	20.4	(23.8)	(43.1)	2,853,000
Japan	10,396,000	0.2	(61.8)	(44.6)	5,756,000
North Korea	9,721,000	37.6	4.5	(28.8)	6,923,000
South Korea	9,573,000	18.6	(0.9)	(28.5)	6,841,000
Totals	584,178,000	35.2	(25.9)	(49.5)	294,882,000

SOURCE: ANALYSIS OF UN POPULATION DIVISION DATASETS

or be annexed by existing cities. Between 2000 and 2020, rural population increased in nine of the South and Southeast Asian fisheries, offsetting the losses of rural population in China and other areas of East and Southeast Asia. Heavy urbanization is expected to continue in East Asia between 2020 and 2050, but will impact less than 300 million rural people. At the same time, rural populations are likely to increase in Pakistan, Cambodia, and the Philippines with low-level declines in India, Sri Lanka and Myanmar, leaving 1.03 billion in the countryside. The urbanization process will not unfold fully if there is interference from climate change, sea risings, economic downturns or global pandemics. Moreover, we can reasonably wonder what employment and housing all these new urbanites might find since Asian cities are already overwhelmed by people trying to survive in tenuous informal sector jobs. Large segments of these urban populations are trapped in dangerous slums where water, sewage and electrical systems are taxed beyond safety, and new shanty towns and/or refugee camps are proliferating at their edges (Davis 2006).

4.1 *Deruralization of the Asian Fisheries?*

In short, "the end of the Asian peasantry" that was predicted by Elson (1998) is not quite as certain as the United Nations urbanization projections make it seem. On the one hand, there is no magic wand (not even urbanization) to wave to "disappear" all these millions of people neatly or efficiently. Consider Pakistan, for instance. After estimating that there were 1.7 million agricultural bonded laborers in the country, the Pakistan Human Rights Commission (2010) established camps to transition 2,000 of these laborers to freedom each year. The government entity soon realized that it would take 170 years to liberate all the agricultural bonded laborers, without taking into account debt bondage in the fishery sectors (Kara 2012: 77). On the other hand, much of so-called urban growth in Asia consists of unstable shanty towns at the edges of cities and larger towns. Except in China and South Korea where there are inventories of state-built housing or corporate compounds at urban peripheries, communities at the edges of Asian cities take four illegal (but weakly regulated) forms: temporary transient camps, squatter shantytowns, pirate subdivisions of substandard rental housing, and some settlements of refugees or internally displaced persons (Davis 2006: 24–43). Essentially, squatters occupy "land that has so little worth that no one bothers to have or enforce property right to it" (Stillwagon 1998: 67). Much of this land lies in floodplains, on steep hillsides, or in fields contaminated by chemicals or garbage.

Urban planners refer to these areas as *peri-urban* zones (Cohen 1996: 299) "where the centrifugal forces of the city collide with the implosion of the countryside" (Davis 2006: 46). These are areas in which rural and urban economic

activities emerge side by side, and there is a mix of farm and nonfarm livelihoods (Schenck 2002). High proportions of Asian populations are concentrated in these peri–urban settlements, including 79 percent of Cambodians, 44 percent of Filipinos, and 41 percent of the Vietnamese (World Bank 2013b: 83). In these communities, 30 to 40 percent of Asian farm and fishing household income derives from nonagricultural sources (Schenck 2002: 121), and most of those livelihoods are in the informal sector (ILO 2007). There is a positive correlation between agricultural growth and non-farm activities in these peri-urban areas, not the kind of deruralization that is predicted by the United Nations. Moreover, these communities are characterized by circular migration between larger cities and their households in the peri-urban fringe. Jan Breman (1996) has documented the *footloose workers* who typify the urban fringes of South Asia, and he argues that their numbers have grown to nearly 500 million in 21st century India alone. Rigg et al. (2016: 336) contend that the predicted deruralization of Asia is less likely to progress because *occupational multiplicity* is a permanent characteristic of rural Asian livelihoods. Indeed, rural households "create a nexus of activities, some farm and others non-farm, some highly commoditised and others quasi-subsistence, some in situ and others ex situ." Such livelihood blending has characterized Asian rural areas for decades as a survival mechanism of peasant farmers (Mao 1926; Chandrasekhar 1993; Ellis 1998).

4.2 *Peri-urbanization in the Asian Fisheries*

Scholars describe 21st century urbanization of Asia as a process other than the city expansion predicted by 2050. Guldin (2001: 23) argues that, in China, we are witnessing "a significant new path of uneven settlement" that is "neither rural nor urban, but a blending of the two" in which economic transactions and labor migrations tie large urban cores to their hinterlands without fully integrating rural areas. However, what happens in the peri-rural community is not driven by processes in the urban core (Aguilar and Ward 2003). South and Southeast Asia are undergoing the emergence of "a completely different urban environment" that is composed of diffuse and disorganized islands that lack a clear center, but have networks of specialized areas with varying degrees of rural/urban mix (Sieverts 2004: 3). In India and North Korea, peri-urban development is described as "a fusion of urban and regional development in which the distinction between what is urban and rural has become blurred" (Drakkis-Smith 2000: 21; van den Berg 2003). In Indonesia and the Philippines, rural/urban hybridization is referred to as *city villages* (McGhee 1991) that are "strange limbos where ruralized cities transition into urbanized countrysides" (Davis 2006: 16).

Jan Breman (2020: 902) contends that "this is a modern form of *nomadism* to ensure that the workforce at the bottom of the economy, shorn off social security and protection, can be bought at the lowest possible price and only hired for as long as their services are required." According to Mike Davis (2006: 46–47), "these labor nomads lack secure footing in either city or countryside, and often spend their lifetimes in a kind of desperate Brownian motion between the two." It is in these 21st century peri-urban spaces "that the reproduction of labor is most likely to be concentrated" (Aguilar and Ward 2003: 18). However, the cost of bearing and maintaining these footloose workers is externalized to severely underpaid peri-urban households that serve as their rural social safety nets, "a support frame of the last resort for the reserve army of labour" (Shah and Lerche 2020: 726). Even though these peri-urban areas will be centers of poverty, hunger and exploitation, they are not likely to undergo the totalizing effects of the Asian urbanization that the United Nations predicts for 2050. Moreover, the characteristics of peri-urban communities and the multiplicity of occupations within households will deter the obliteration of peasant identity and their rural livelihoods by the expansion of large cities (Bryceson et al. 2000; Shah and Lerche 2020).

According to Asaf Bayat (1997: 56–57), these peri-urban settlements "seek to expand the survival space and rights of the disenfranchised." Small and marginal peasants resist urbanization by struggling to hang onto land and waterway access, even when they earn less of their household income from agriculture or fishing (Brycesyon et al. 2000: 225). Part of their survival resources come from the remittances from footloose household members and from women's nonagricultural earnings in the peri-urban community (Breman 2020). Asian peasant farmers and fishers are likely to persist in these peri-urban areas because of their diversity of class and ethnicity and their degree of control over land and resources. Politically, middle-class and land-owning peasants sometimes align with the interests of poorer peasants (Bryceson et al. 2000: 215–219), as is the case with the 2020–2021 Indian farmer rebellion which successfully led to repeal of new farm laws (Basu 2021; Schmall et al. 2021).).[10] Furthermore, there are hundreds of political and activist organizations that offer frameworks for resistance.[11]

10 Similarly, Japanese peasants garnered political support for specialized organic farming for which they now have a domestic demand of $14 million (Moen 1997).

11 See, for example, the discussion of agrarian unions in Ness (2021: 131–43).

5 Asian Debt Bondage and the World Food System

Worldwide, there are more bonded and forced laborers in agriculture, fishing and aquaculture than in any other industries (Walk Free Foundation 2018: 21). Moreover, the historical shift to globalized food and fishery exporting has been a major driver toward expanded numbers of these coerced laborers (US State Dept. 2016). Shrimp, rice, palm oil, tea and Indian cigarettes are the commodities that employ the greatest numbers of bonded and forced laborers, including children (U. S. State Dept. 2016, Basu and Chau 2004). However, shrimp and rice are the two commodities in the world food system that are most likely to keep export prices cheap through reliance on bonded labor (Barclay 2013). Driven by several ecological disasters and the global economic crisis, the incidence of Asian debt bondage grew nearly two percent between 2007 and 2011. According to Siddharth Kara (2012: 237–38), "the 2007 commodity bubble doubled the prices of basic food and fuel inputs for billions of the poorest people in the world. ... The subsequent global economic meltdown... evaporated markets for many goods and services provided by the poor, caused cuts to social safety nets and poverty alleviation schemes, and increased migration levels." The international land grabbing that followed the 2008 recession further exacerbated debt bondage and labor trafficking (see Chapter 7).[12] In Southeast Asia, for instance, investors displaced local smallholders, then recruited contract and tenant farmers and waged laborers from adjacent countries (Beban and Gorman 2017; Bissonnette and Konick 2017; Marks et al. 2015). These trafficked contract farmers netted the new land owners an estimated 56 percent profit margin annually. At the end of the recession, annual worldwide profits from debt bondage were $96.5 billion (Kara 2012: 237–242),

In 2011, an upper caste South Asian landowner could acquire a bonded laborer for an average initial outlay of $200. Annually, the owner could expect to net a profit of $2,585 from the exploitation of that peasant. As a result of such arrangements in 2011, the total bonded debt in South Asia was $4.5 million, each peasant owing an average $282 (Kara 2012: 216, 237). Bonded labor takes two systemic patterns: (a) domestic farmers and fishers indebted to landowners or traders and (b) laborers recruited and trafficked by legal and illegal agents for transnational employers (Kara 2012; Walk Free Foundation 2018; US State Dept. 2016). As Table 25 shows, there are currently

12 In Southeast Asia, investors displaced local smallholders and recruited contract and tenant farmers from adjacent countries, and they preferred to hire foreign waged laborers (Beban and Gorman 2017; Bissonnette and DeKronick 2017; Marks et al. 2015).

TABLE 25 Estimated bonded/forced laborers employed in agriculture, fishing and aquaculture, 2018

Fishery territory	Number	Incidence per 1,000 rural laborers
Part A. South Asia		
S [a]Bangladesh	370,592	2.3
S [a]India	5,232,795	5.8
S [a]Pakistan	2,010,366	14.7
S [a]Sri Lanka	35,816	2.0
Total	7,649,569	9.0
Part B. Southeast Asia		
S [a]Cambodia	198,621	15.8
S [a]Indonesia	536,800	4.5
M Malaysia	49,608	6.6
S Myanmar	397,325	16.6
S [a]Philippines	413,952	7.3
M Thailand	300,730	9.8
S Vietnam	266,914	4.4
Total	2,163,950	9.3
Part C. East Asia		
M China-Mainland	1,418,088	2.8
L China-Taiwan	2,580	2.0
L Japan	3,071	1.4
S [a]North Korea	1,000,560	107.8
L South Korea	18,228	1.9
Total	2,442,527	14.4

a 2010 low-income food-deficient country (FAO 2011a).

SOURCE AND NOTES: THE FIRST COLUMN WAS ESTIMATED BY MULTIPLYING THE PERCENTAGE OF RURAL POPULATION (SEE TABLE 21) BY THE TOTAL NUMBER OF BONDED/FORCED LABORERS (WALK FREE FOUNDATION 2018). THE LETTERS BEFORE NAMES REFER TO THEIR 2019 GLOBAL HUNGER INDEXES (CONCERN WORLDWIDE 2019). S = SERIOUS, M = MODERATE, L = LOW

more than 12 million bonded workers concentrated in agriculture, fishing and aquaculture in the sixteen Asian fisheries, and they account for nearly 55 percent of bonded/forced laborers worldwide. The highest incidence of

debt bondage occurs in Pakistan, Cambodia, Myanmar, North Korea, and Thailand, followed closely by the Philippines. More than three-quarters of the bonded laborers are situated in four countries: India, Pakistan, Mainland China and North Korea. Integration into global agribusiness chains stimulates greater debt bondage among Asian peasant farmers, as indicated by debt-driven suicides (Despande and Arora 2010). In order to make the transition to export crops, smallholders take on extensive debt, placing themselves in debt bondage to agricultural supply merchants and large land owners (Green 2021: 15).

5.1 *Agricultural Debt Bondage*

Debt bondage has been widespread for decades throughout Asian peasant agriculture. Throughout South and Southeast Asia, peasant smallholders are involved in lease/sharecropping arrangements in which they assume liability for housing, household advances, seeds, fertilizers, pesticides, tractors and irrigation systems, all of which are over-priced in owner accounting. One third-to two-fifths of tea plantations in Bangladesh and Sri Lanka have relied on bonded labor for multiple generations. After 150 years, tea laborers "remain an isolated and harshly exploited subpopulation," many of them trapped on the same plantations to which their grandfathers were trafficked decades ago (Kara 2012: 130). Typical interest rates in agriculture range from 50 to 60 percent, and the term of indebtedness averages 5.7 to 6.8 years. Most of these indebted peasants are illiterate, and some have been indebted over generations. Among agricultural bonded laborers, extreme working schedules, physical violence, sexual exploitation, high child mortality and severe levels of hunger and malnutrition are common (Kara 2012: 8, 72, 76).

Since 2010, recruitment of migrant laborers has been intense for large palm oil plantations in Malaysia, Thailand and Indonesia. For their year-round harvesting, production, and export operations, these plantations are heavily dependent on bonded migratory laborers trafficked from Bangladesh, India, Myanmar, Indonesia and Thailand. Criminal gangs transport Vietnamese laborers through Cambodia to be exploited on palm oil plantations in Thailand and Malaysia. Most of the transnational laborers employed in palm oil agriculture migrate through irregular channels without identity documents. Legal and illegal brokers move them over public roads or smuggling routes and act as intermediaries with employers. Workers are indebted to these brokers for recruitment and transport fees, bribes to corrupt officials, and initial employer charges. To reduce worker escapes, brokers and employers confiscate identity documents (US State Department 2016).

5.2 *Debt Bondage in the Asian Fishing Industry*

Throughout Asia, fishers are the very poorest households largely because so many of them are indebted to the mid-level traders to whom they sell their fish. Chapters 4 and 5 provide details about how these arrangements are structured in the Philippines. Nearly three-quarters of frozen shrimp exported from the Asian fisheries are tainted by bonded or forced labor (Walk Free Foundation 2018). Shrimp farming in Bangladesh, China, India, Pakistan, the Philippines, South Korea, Thailand and Vietnam relies heavily on bonded peasant leaseholders (see Table 26). In those countries, rapid transformation of farmlands into shrimp ponds displaced millions and led to an industry heavily reliant on bonded labor. Operating under bonded labor agreements, peasant shrimp farmers either take loans to lease land or accept capital investment to develop a pond on their own land. Their debits include initial shrimp fry, technology, feeds, chemicals, fertilizers, and antibiotics, and repairs due to ecological disasters are externalized to them (Kara 2012).[13] In Bangladesh, there is a disproportionate level of bonded laborers in shrimp and fish farming who take out very high loans to lease land, construct fishponds, and cover the cost of fishpond inputs. "The lease rates are just slightly higher than the average gross profit from shrimp farming. ... Any sort of systemic infection or natural disaster that obliterates a single season of shrimp places them in a debt hole from which it would be virtually impossible to escape. ... The economics of the system are clearly designed to ensure the persistence of debt bondage for many of the 800,00 to one million shrimp farmers in Bangladesh" (Kara 2012: 116). Most peasant shrimp farmers become trapped in such long-term indebtedness (Shiva 2000), and the lands where they farm shrimp are permanently transformed into salinized soils unfit for future agriculture (Primavera 1997).

Legal and illegal agents recruit aggressively for laborers to supply the commercial fishing fleets of Japan, Thailand, Taiwan, China, Indonesia, South Korea and Malaysia (see Table 26). Since 2014, the U. S. Congress, NGOs, scholars and international media have drawn attention to the heavy reliance of Asian fishing fleets on bonded/forced labor, and the situation in Thailand is viewed as especially exploitative (Urbina 2015; Marschkea and Vandergeest 2016; US State Dept. 2016; International Justice Mission 2017; Human Rights Watch 2018; Environmental Justice Foundation 2018). Corrupt officials in source countries cooperate with labor brokers in destination countries to facilitate the trafficking and debt bondage of laborers between countries, and they often conceal the activities of illegal recruiters who have ties to government

13 We found such arrangements in our Philippine field research; see Chapters 4 and 5.

TABLE 26 Economic sectors and migration patterns of bonded and forced laborers, 2010–2020

Asian territory	Domestic bonded laborers are concentrated in these domestic sectors:	Bonded migratory laborers are exported to:
Bangladesh	*Domestic Laborers*: agriculture, peasant fishing, aquaculture *Migrant Laborers*: ethnic Indians in tea plantations, aquaculture	Malaysia: palm oil, commercial fishing vessels Japan: commercial fishing vessels
Cambodia	*Domestic Laborers*: agriculture, peasant fishing	Thailand, Japan, Taiwan, China, Indonesia: commercial fishing vessels Vietnam: Aquaculture (shrimp farming & processing)
China–Mainland	*Domestic Laborers*: peasant fishing & agriculture, aquaculture, commercial fishing vessels *Migrant Laborers*: North Korean women in agriculture; Cambodian, Philippine laborers in commercial fishing vessels *Ethnic Minorities*: re-education & camp imprisonment of Uighurs for farm laborers	South Korea, Japan: commercial fishing vessels
China–Taiwan	*Migrant Laborers from Sri Lanka, Thailand, Vietnam, Cambodia, Indonesia:* commercial fishing vessels	
India	*Domestic Laborers*: peasant agriculture & fishing, Aquaculture (esp. shrimp farming)	Malaysia: palm oil, commercial fishing vessels *Ethnic Minorities*: Indian Tamils trafficked to Bangladesh tea plantations
Indonesia	*Domestic & Migrant Laborers*: peasant fishing, palm oil, commercial fishing vessels	Malaysia: 1.9 million Indonesians in palm oil, commercial fishing vessels Taiwan, South Korea: commercial fishing vessels

TABLE 26 Economic sectors and migration patterns of bonded and forced laborers, 2010–2020 (*Cont.*)

Asian territory	Domestic bonded laborers are concentrated in these domestic sectors:	Bonded migratory laborers are exported to:
Japan	*Migrant Laborers from Philippines, Cambodia, China Bangladesh, Pakistan, North Korea*: commercial fishing vessels	
Malaysia	*Migrant Laborers from Indonesia, India, Bangladesh*: palm oil, commercial fishing vessels 1.9 million Indonesians in palm oil & commercial fishing	
Myanmar	*Domestic Laborers*: peasant fishing & agriculture	Indonesia, China, Malaysia, Thailand: commercial fishing vessels, palm oil
North Korea	*Domestic Laborers*: peasant fishing, agriculture in forced labor camps	Japan: commercial fishing vessels China: government contracts for agriculture
Pakistan	*Domestic Laborers*: peasant fishing, aquaculture (esp. shrimp farming), agriculture	Japan: commercial fishing vessels
Philippines	*Domestic Laborers*: peasant fishing, agriculture *Ethnic Minorities*: Muslims in peasant fishing & agriculture, aquaculture (esp. shrimp farming)	Japan, Malaysia: commercial fishing vessels
South Korea	*Domestic Laborers*: peasant fishing, agriculture, aquaculture (esp. shrimp farming) *Migrant Laborers from Vietnam, Indonesia, China:* commercial fishing vessels	
Sri Lanka	*Domestic Laborers*: peasant fishing, agriculture (esp. tea) *Ethnic Minorities*: Tamils on tea plantations	Taiwan: commercial fishing vessels India: Tamils to tea plantations

TABLE 26 Economic sectors and migration patterns of bonded and forced laborers, 2010–2020 (*Cont.*)

Asian territory	Domestic bonded laborers are concentrated in these domestic sectors:	Bonded migratory laborers are exported to:
Thailand	*Domestic Laborers*: peasant fishing, agriculture (esp. palm oil), aquaculture (esp. shrimp farming)	Malaysia: migrant palm oil camps of Thais on the Malaysian border
	Migrant Laborers from Cambodia, Vietnam, Indonesia, China: commercial fishing vessels	Malaysia, Taiwan: commercial fishing vessels
Vietnam	*Domestic Laborers*: peasant fishing, agriculture	South Korea, Taiwan, Thailand: commercial fishing vessels
	Migrant Laborers from Cambodia: aquaculture (esp. shrimp farming)	

SOURCES: WALK FREE FOUNDATION (2018), U. S. STATE DEPT. (2016), KARA (2012); URBINA 2015; MARSCHKEA & VANDERGEEST 2016; INTERNATIONAL JUSTICE MISSION 2017; HUMAN RIGHTS WATCH 2018; ENVIRONMENTAL JUSTICE FOUNDATION 2018

officials. Rescued laborers have reported physical abuse, withholding of wages, being held in cages or cells on land between work shifts on trawlers, and being forced to remain aboard Thai vessels for years (US State Department 2016). Most Thai international shipping vessels are owned by "parent companies that operate under the auspices of Thai-Indonesian shell companies. Thai traffickers issue fake Thai identity documents to foreign workers and force them to fish in Indonesian waters, threatening to expose their fake identities if they contact Indonesian authorities. Thai-Indonesian shell companies based in fishing ports in eastern Indonesia perpetuate these abuses by prohibiting fishermen from leaving their vessels or detaining them on land in makeshift prisons" (US State Department 2016: 37).

Such labor trafficking is now investigated and condemned internationally by the United States, but its latest report (US State Department 2016) does not acknowledge that the cheap seafood prices enjoyed by Americans are the driving force for the development and maintenance of such labor exploitation methods. All of the Asian seafood industries must systematically reduce their labor costs to an extreme degree in order to remain price competitive for markets in the USA, European Union, China and the Middle East.

> In the Thai seafood sector, efforts to remain competitive have been associated with importing its seafood labor force from the poorer, and more firmly peripheral states [on which] it borders. This reliance on severe exploitation points to the geo-political significance of semiperiphery nations in global value chains, particularly in the buyer-driven global food system. Expansive and extra-legal fishing measures are required in order to maintain some degree of economic viability in a highly competitive labor value chain where Global North retailers and distributors can control the price of commodities. (Clark and Longo 2021: 18–19)

In similar fashion, the Taiwanese seafood industry keeps prices low by recruiting labor for its fishing vessels from the Philippines, Thailand, Cambodia and Vietnam. To keep labor costs low, the ship operators charge exorbitantly high recruitment fees, resulting in substantial debts that brokers or employers use to coerce laborers into long-term contracts on fishing trawlers. After broker fees and employer charges are garnished from their wages, most workers earn significantly less than the legal minimum wage in the Asian countries where they are employed (US State Department 2016: 361).

5.3 *Asian Climate Change and Debt Bondage*

In Chapter 7, we stated that climate change will likely be the worst future threat to Asian peasants. By examining the horrific interaction effects between ecological disasters and debt bondage, readers will understand why we make that claim. First, environmental damage to crops, fishponds, and shrimp farms are externalized to indebted peasants, extending their debt bondage to land owners. Second, ecological disasters destroy homes and food, forcing laborers to draw more debt from owners. Third, ecological disasters can create the conditions for new economic activities that trap peasants in long-term bonded (often forced) labor arrangements. For example, the destructive 2010 monsoon season flooded vast areas of Pakistan, Bangladesh and northern India, leading to higher levels of debt bondage (Kara 2012: 97). In Pakistan, monsoon floods displaced more than 20 million rural peasants and inundated 70,000 square kilometers of farm land, destroying a majority of crops for 2010 and 2011. Many Pakistani sharecroppers

> sought to use the destruction of the floods to escape the debt bondage that tied them to landlords. In the period of confusion and reorganisation that accompanied the floods, individuals and families began to uproot to... urban centres. Indeed, the prospect of migration chipping away at the subordinate sharecropping labour force was not lost on the landlord

> class, who used their considerable political leverage to have the camps for those displaced by floods shut down to prevent them serving as a launch pad for urban migration. (Taylor 2014: 136)

Since five percent of agricultural households own nearly two-thirds of Pakistani farmland, peasant farmers plunged deeper into debt, landlessness increased, and transnational migration escalated dramatically (Tariq 2018). Food prices skyrocketed. Some trafficked children and sold kidneys to repay debts (Kara 2012: 70–73).

Following Hurricane Aila in West Bengal, numerous villages were destroyed. Landowners offered to rebuild homes in exchange for labor to roll *bidis*, Indian cigarettes that are marketed throughout South Asia.

> A total of 2,900 villagers were caught in bonded labor for bidi rolling. In exchange for rebuilding the homes and allowing the villagers to live in them, the landowners required the villagers to work six days a week rolling bidis. They were not allowed to leave the village area nor take on any other work. If they broke these rules or did not roll enough bidis, they would be evicted. ... They roll the bidis all year round, and at some point during the year just about every family needs an advance. ... The *jamadar* offers the advance, and the family is that much more pressured to roll more bidis. ... In addition to severely cramped fingers and neck and back ailments, many villagers suffer from tuberculosis and other respiratory ailments. (Kara 2012: 97–98)

Since the 2010 hurricane and flooding, nearly 98 percent of the one trillion *bidis* produced in India every year are hand rolled by more than four million laborers, half of whom are in long-term debt bondage. At least $2 billion of the bidi trade can be attributed to bonded laborers, each of whom provides a net profit of $500 yearly to the creditor (Kara 2012: 100).

Sometimes, an historical comparison provides the best sense of the severity of labor exploitation. The labor practices used to hand roll India's 21st century cigarettes are more archaic and more labor intensive than those that characterized the workplace of slave laborers in 19th century American tobacco factories. Those slave laborers worked in systematized factories in which workers were rationalized to different tasks, they had access to some machinery, and they worked fewer hours each week than today's bidi rollers. Children and women worked in both contexts, physical abuse of American slaves was probably more frequent and severe, but the American slaves were not likely to be evicted from housing as punishment. Today's Indian debt bonded peasants and

the 19th century slaves were equally at risk of acquiring respiratory diseases, skin aliments and cancers, but neither group was likely to receive medical care. Here is the most startling historical comparison. With many of the costs of production externalized to their households, Indian peasants are severely exploited in order to keep consumer prices cheap at $0.20 per pack of twenty-five. Unlike 21st century poor Asians, the average working class person in 1850 America could not afford a package of cigarettes. At 2020 values, the historical price for cigarettes manufactured by American slaves was higher than today's price for a pack of bidis that is hand rolled by Indians in debt bondage.[14]

6 Will Asian Peasants Persist in the 21st Century?

Food extractive enclaves, like the sixteen Asian fisheries, are populated by concentrations of the hungriest, most malnourished people worldwide. Despite the threats to their survival, Samir Amin (2010: 14, 89, 134) argues that economic growth will not lead to the disappearance of peasants. Even a 7 percent rate of growth for fifty years across the entire Global South, he contends, would not lead to the proletarianization of the world's vast peasant population. Thus we have seen that the sixteen Asian fisheries have not been "depeasantized." Between 2000 and 2020 when national and local governments have prioritized export agendas that dispossessed peasants from lands and waterways, the rural populations *increased* in twelve of the Asian fisheries.[15] Neither government policies that privilege large export producers nor lack of equitable credit has caused Asian peasant food producers to disappear (McMichael 2006; van der Ploeg 2010). In a nutshell, Asian peasants have persisted for two reasons. First, peasant farmers and fishers are economically valuable to capitalists who have historically exploited them but never fully destroyed them. Willingly and unwillingly, peasants are integrated as nonwaged producers and suppliers into the global commodity chains that produce and move the goods of the world food system across multiple national boundaries.[16] For example, 21st century

14 Regarding American slaves see Dunaway (2003: 109–113). The 1850 price for U. S. cigarettes is standardized to 2020 values. The contemporary price of an American pack of cigarettes is nearly $4.00, but it is probably more cancerous (according to the Center for Disease Control) than the Indian bidis.

15 Analysis of UN Population Division database.

16 According to the World Bank (2020c: 30–31, 105), the vast majority of international trade is managed through these chains which effect downward pressures on labor through heightened competition, driving down the share of the sales prices and/or profits that accrue to the producing laborers.

land grab investors have simultaneously dispossessed peasants of their lands and created new mechanisms to capture their labor. However, less than 30 percent of the export value of a food crop and less than 21 percent of the export value of a fishery commodity accrue to peasant producers in developing countries (Greenville and Jouanjean 2019: 13–14; NORAD-FAO 2013: 3).

In Southeast Asia, local and foreign contract farmers were integrated into the operations of palm oil, rubber and biofuel plantations (Beban and Gorman 2017; Bissonnette and Konick 2017; Marks et al. 2015). As we describe in Chapters 4 and 5, peasant provision of low-paid nonwaged labors, unpaid labors, and their debt bondage support the *degrees of monopoly* of capitalists who control global commodity chains, allowing them to collect profits while providing cheap prices to distant consumers (Clelland 2014). Second, peasant farmers and fishers resist complete destruction or transformation of their livelihoods and cultures through community and national political activism and transnational alliances. "To label oneself a *smallholder* or to be labeled as such by national or transnational actors is to assert a certain politics of meaning" (Peluso and Lund 2017: 839).

6.1 *Why Peasant Farmers are Essential to Capitalism*

Mao Tse-Tung (1926) was the first to employ the term *semiproletarian* to describe peasant households that survived hard times in the early 20th century by merging agriculture with nonagricultural income. In the 21st century, Asian peasant households are *semiproletarianized*, i.e., they merge waged and nonwaged nonfarm labor, informal sector activities, household production, and migrant remittances with earnings from agriculture (see Chapter 6). Thus, Asian peasant households overcome agricultural crises by merging multiple livelihoods, members often engaging in circular migration to combine farm and nonfarm incomes during different seasons of the year. The analyses of the state of the peoples on the lands grabbed by investors (Land Matrix 2016), as well as the diverse array of farmers involved in 2020–2021 resistance against India's new land laws, make clear that Asian peasants are integrated into– and often battling against– capitalist markets.[17] In reality, peasants provide functional and profitable labor to capitalists because they undertake a number

17 The notion that a peasant is strictly a poor subsistence producer who operates outside all market ties (e.g., Robinson 1979: 47; Zhang and Donaldson 2010) is romantic and outdated. This essentialist view presumes that peasants want to (or will be allowed to) stay outside markets and outside global commodity chains. First, so many peasants are trapped in debt to traders who export. If they never sell anything, how would they meet contractual obligations to land owners, pay taxes, school expenses, medical expenses or pay off their indebtedness? Second, part of their production still ends up in a global commodity chain,

of different types of nonwaged and waged work. Today's peasants are *mixed livelihood households* in which nonwaged labor forms (both free and unfree) predominate, with very little likelihood of future transition to household dependency on wages. In the early 21st century, only one in five Asian peasant farm households relies solely on agricultural income. Indeed, Asian peasant farm households acquire as much as half their income from non-farm sources, primarily from local informal sector activities coupled with remittances from migratory family members (Walker 2012; Reardon et al. 2007).

However, wage earning is *not* the predominant mechanism through which these households are integrated into the modern world-system. According to Samir Amin (1975: 44), *full proletarianization of peasants* is a rare exception to the normal operations of agrarian capitalism. Since capitalist agriculture and fishing do *not* "require the emergence of a rural proletariat" (Brass 1999: 2), peasant farmers and fishers have a "strong degree of autonomy from waged labour" (Akram-Lodhi and Kay 2010: 273). In reality, most contemporary peasants must prioritize production of market commodities that are contractually committed to landlords, traders, or capitalist enterprises. Furthermore, Asian peasants are not "independent" household producers. Instead, their relations of production with capitalist exporters involve debt bondage, sharecropping and contract farming. For Asian peasants, debt bondage, informal sector activities, contract farming, and sharecropping have *not* been temporary nonwaged forms on an inevitable path toward proletarianization. A majority of the world's peasants still earn their livelihoods through nonwaged labor in economic activities that are *not* transitional to wage earning (ILO 2007). Moreover, the rural informal sector still thrives as a significant source of peasant income (Bryceson et al. 2000). The informal sector accounts for 78 percent of Asian workers (ILO 2007), including most peasant farmers and fishers (see Chapter 5).

Since they are profitable and efficient for capitalism, peasants are not likely to disappear, even though public policies marginalize them, and capitalist commodity chains impoverish them. For these reasons, modern capitalism is not likely to eliminate peasants or to push toward their full proletarianization because the mix of nonwaged and waged labor enables capitalists to maintain high profits (see Chapter 5). Indeed, there are functional advantages for leaving capitalist agriculture in peasant hands. "Without the peasants' supply of cheap seasonal labour," contends Julio Boltvinik (2016: 46), "capitalist agriculture would be impossible" unless "the social cost of seasonality is absorbed

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even when they only trade or barter locally, (as we describe in our ethnographic study of Philippine small-scale fishers).

by peasants," most of whom live in poverty. In effect, peasants minimize production costs, lowering export prices. Indeed, "peasants mobilize the entire family's potential labour power while earning the equivalent of a labourer's wage, and quite often receiving a much lower income than that" (Vergopoulos 2016: 306). In addition, these households provide nonwaged labors and services to capitalist commodity chains that, in turn, extract unpaid dark value drains (Clelland 2014, 2015b) from them and externalize costs of production to them (see Chapter 5). Consequently, peasant poverty is "the hidden, necessary and complementary face of the contemporary capitalist moon. Indeed, it is merely a necessary condition for the general profitability of the capitalist system" (Vergopoulos 2016: 309).

6.2 *The Persistence of Asian Peasant Fishers*

To get a sense of how difficult it would be to eliminate peasant fishers (also referred to as small scale or artisanal), let's begin by reviewing the numerical proportions. The conservative worldwide estimate is that there are nearly 55 million registered small scale fishers, 82 percent of them located in the sixteen Asian fisheries, totaling more than 45.1 million. Between 1995 and 2018, the number of Asian small scale fishers *increased* 64 percent. Most of those who fish inland Asian fresh waters are small scale operations, and a majority of them live in small fishing communities. While the term "Asian fishing fleet" sounds like large industrial vessels, 86 percent are small boats that primarily employ nonaggressive gears and nets (FAO 2018; Smith and Basurto 2019).

In the face of marginalization, rising debt and dwindling catches, why do Asian peasant fishers persist? First, there is a dialectical relationship between export fishery sectors and peasant fishers. In reality, neoliberal export strategies are not leading to the death of the peasantry. Instead, these fishing households are profitable elements of global commodity chains to which costs are externalized and from which surpluses are extracted through low paid and unpaid labors and inputs. In short, consumer prices are kept low because these peasants subsidize the production and marketing processes (see Chapters 5 and 6). In short, nonwaged peasants are crucial to capitalists because they produce valuable commodities at lower costs than can be achieved through other approaches (see Chapter 5).

Second, debt bondage operates to keep peasant fishers from leaving their occupation, as fishing is their only means to meet debt obligations and to obtain part of their household survival needs. In fact, traders and middle sector traders utilize debt bondage as a strategy to keep these workers committed to long-term exploitative putting out arrangements in order to attain a degree of market monopoly (see Figures 16 and 17). In addition, bonded peasants are

concentrated in shrimp farming through (a) a lease/sharecropping arrangement with a landed investor or (b) a contract in which an investor provides capital to a peasant land owner who builds and manages a shrimp pond for a share of the production. The investor charges initial inputs, repairs and household advances against final sale proceeds. The cost of repairs or losses caused by ecological disasters is externalized to the peasant farmer, increasing the probability that the farmer will have to rollover debt to following seasons (see Chapter 5).

Third, there are no other occupations to absorb more than 39 million peasant fishers who are better aware than policymakers that they can generate more survival resources through fishing than through alternative livelihoods. Fundamentally, these fishers are accurate when they argue that there are no other jobs that will insure them the survival needs they secure from fishing. In fact, more than one-third of Asian fishers shifted into fishing after their waged jobs in agriculture and industry disappeared. Asian fishers are creative at finding methods to continue in fishing. Some overcome declining catches in their home communities by migrating to follow the seasonal flows of fish and shellfish (Siar and Kusakabe 2020). Male fishers are subsidized by the earnings of wives from non-fishing sources (see Chapter 6) and from household members who move in circular fashion between rural and urban livelihoods, treating the fishing household as home. Fishing households, "are not stagnant entities but adaptive units with agency who often diversify livelihoods to meet household needs" (Siar and Kusakabe 2020: 15). Furthermore, "alternative occupation projects for fishers are likely to fail if they cannot provide the noneconomic aspects of job satisfaction that fishing does" (Cinner et al. 2008: 130).

Fourth, Asian peasant fishers are likely to persist in the 21st century because of their resistance movements and their political activism (McMichael 2008; Hall and Fenelon 2009; van der Ploeg 2010). They are represented by national and local resistance organizations that keep their plight before the media, politicians, NGOs and researchers (Pinkerton 2017).[18] For that political reason, it is not likely that depeasantization will totally sever small fishers from the ecological resources they employ to produce part of their livelihoods and household needs. Numerous fisherfolk organizations keep their agendas within the purview of national and local politicians (Desmaris 2007), and they are aligned with global activist organizations, like La Via Campesina, the international food sovereignty movement, Focus on the Global South and FAIN

18 For example, fisher resistance to the Japan-Philippine trade agreement JPEPA made national and international news, and these organizations played a part in generating the 2009 call for a panel to reassess JPEPA (*Philippine Star*, 25 January 2011).

International. Western marine scientists advocate the significance of small scale fishing for ecological protection and for future food security. According to Daniel Pauly (2006: 16), "fish-based cultures will not survive if we do not manage to put small-scale fisheries and resources first. ... Realistic scenarios for such transitions exist, but their alternative scenarios, with more over-fishing by subsidised industrial fleets and neglect of the small-scale fisheries, are still appealing to our policy makers."

Fifth, and perhaps most important, most fishers do not desire to leave their traditional work, even in the face of public depeasantization policies and narrowed access to ecological resources (Shiva 2000; Klein et al. 2003). Between 1995 and 2018, the number of Asian fishers increased dramatically. In the Philippines alone, at least one million people are employed in artisanal and commercial fishing, and another six million depend on fishing for their livelihoods (Jacinto 2004). Based on ethnographic studies of Asian fishing communities, Siar and Kusakabe (2020: 37) contend that "fishers have a strong identity as fishers and the old fishers are determined to continue their occupation." Despite declining catches and limited access to resources, Asian peasant fishers still have access to some of their traditional means of production. As one Philippine fisherwife put it, "there will always be *some* food to eat, if we are industrious enough." Moreover, they verbalized in interviews that they cannot replicate their living conditions if they migrate to urban areas. One fisher explained that his family could not secure an equivalent amount of food by migrating to a city where they would have to depend on waged jobs that "do not last long." Peasants also told us that most of their adult children in urban areas were impoverished, erratically employed in waged jobs and dependent on informal sector earnings.

These fishers expressed views that are advocated by several contemporary scholars who study the global food crisis. For example, Shiva (2016) and McMichael (2006) describe the need for Global South countries to reconstitute "peasant spaces" that challenge the globalized corporate food regime. According to Eric Vanhaute (2008: 57), the "peasant way" combines "local forms of social reproduction with local strategies of income and food security and local forms of knowledge. Most important is the peasant knowledge of internalizing costs of production and reproduction, contrary to the dominant and ultimately dead-end tendency within historical capitalism to externalize social and ecological costs." We should not under-estimate the great pride that peasants have in their work and in their family fishing heritage. They are quite rational when they vocalize greater certainty about fishing than about unreliable forms of employment that have emerged and declined over their lifespans. One fisher probably captured the sentiments of the majority of Asian peasants when he

told us: "My father and my grandfather was a fisherman, and so I am a fisherman. I was born a fisherman, and I will die a fisherman. That does not make me unhappy."

7 Conclusion: Seeing Hunger through the Fisherwoman's Lens

The world food system is "a stratified global division of consumption in which the increasingly extensive commodification of the human and nonhuman world has driven forward an expansive industrial metabolism geared towards the relentless accumulation of capital, yet hinged to the parallel production of climate at a global scale" (Taylor 2014: 191). Rather than ending hunger and malnutrition, food exporting and importing are displacing traditional healthy food/fishery production and consumption patterns (see Tables 6 and 7). Because of their debt bondage and/or contract farming arrangements, peasant farmers and fishers are caught in the trap of contributing to their own nutritional shortfalls by participating in the export of foods. Briefly, let's examine the world food system from the vantage point of the daily hunger dilemma that faces a Philippine fisherwife. She exchanges her iron-rich, higher-value mollusks (e.g., oysters, clams) and her husband's most nutritious shellfish (e.g., crabs, shrimp) or finfish (e.g., tilapia) for polished high-carbohydrate white rice. *You must run fast and work hard to catch the rice* is a cultural expression that we heard frequently during our Philippine ethnographic research. Daily, she makes food decisions for her family, and those choices are severely constrained. She and her husband are aware that peasant fish catches have steadily declined in the face of commercial trawlers and aquaculture, but they operate within the constraints of a debt bondage arrangement with their trader. Consequently, her food budgeting is grounded in the view that rice is more rational because it "numbs" the hunger and will feed more people in her household.

In our ethnographic interviews, wives indicated that they kept the "worst" of the daily catch and sold the "best" because that is what the traders require. Indeed, her daily food trading decisions are grounded in global and national development policies that prioritize the export of her household's most nutritious fishery outputs. However, the fisherwife may not see beyond these difficult daily complexities. In our interviews we did not encounter any fisherwife who connected her anemia, her problem pregnancies or the stunting of her child to her *nutritional unequal exchanges* with the local trader, even though some of them realized that part of their traded fish would eventually arrive in one of the least hungry zones of the world (see Table 5). When we told a

fisherwoman that her oysters contained enough iron to end the anemia she and her children suffer, she responded: "But oysters bring in cash outside my husband's debt with the trader, and I need that money to buy food and pay school fees."

Herein sets the daily weight of the world food system on the shoulders of an Asian fisherwoman. She allocates her household's high-value, most nutritious outputs to a trading network that will ship them to profit-motivated agribusinesses that will export them into the world food system. Globally, those who are rich enough are overfed with the exotic Asian species supplied by households like hers, but those faraway consumers will need to work far fewer hours to buy the fish or oysters than the Philippine household utilized to capture them. While supplying luxury foods to those who can be healthy without them, the fisherwife puts her household members at risk of nutritional shortfalls through her marketing decisions that repay debts to the trader. Systemically, their household debt bondage and nutritional unequal exchanges are dark value drains that derive from Asian development policies that endanger ecological resources and threaten peasant farmers and fishers in order to export their most nutritious foods to repay international debts.

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