

Inclusive Innovation

**Robyn Klingler-Vidra, Alex Glennie, and
Courtney Savie Lawrence**

First published 2022

ISBN: 9780367647001 (hbk)

ISBN: 9780367646998 (pbk)

ISBN: 9781003125877 (ebk)

1 An introduction to inclusive innovation

CC BY-NC-ND 4.0

DOI: 10.4324/9781003125877-1

Financial support provided by King's College, including research seed funding and the King's Undergraduate Research Fellowship (KURF) schemes, enabled the book's open access availability.

1 An introduction to inclusive innovation

Innovation offers potential: to cure diseases, to better connect people, and to make the way we live and work more efficient and enjoyable. At the same time, innovation – especially technological innovation – can fuel inequality, decimate livelihoods, and harm mental health.¹ This incongruence leads us to ask: can we uplift the benefits of innovation for the environment and society while reducing the harms? In this book, we contend that “inclusive innovation” is the form of innovation that strives to meet this ambition. We define inclusive innovation as:

the pursuit of innovation motivated by environmental and societal aims, with problem-owners – often working with multiple stakeholders – responding to challenges experienced in their local context.

The term inclusive innovation was first used in a 2007 World Bank (WB) report, in which Mark Dutz coined the phrase in the context of sustainable innovation in India. He defined it as “knowledge creation and absorption efforts that are most relevant to the needs of the poor.”² The emphasis for Dutz, and for many scholars and policymakers in the years since, was on social inclusion, specifically in socioeconomic terms.

We argue that the notion of innovation for environmental protection and social inclusion purposes is older than 2007. We contend that it has roots in the appropriate technologies (AT) movement that began in emerging economies in the 1960s. The AT movement aimed to assuage the tendency toward innovation investments in – and the gains being captured by – the rich, industrialized world.³ The AT movement, epitomized by the work of Schumacher in *Small is Beautiful*, argued that innovation should be designed to leverage local inputs – particularly abundant labor – rather than replace them.⁴ Instead of emerging economies inheriting technological innovations that flow from high-income to low-income consumers, Schumacher’s contention was that innovation should be developed by local labor in order to solve local challenges, leverage local resources, and benefit the local environment.⁵ The AT movement, as epitomized by Schumacher’s thinking, advocated for small-scale, but locally-impactful, innovation, especially in developing countries.⁶

2 *An introduction to inclusive innovation*

Despite the antecedents offered by the AT movement, inclusive innovation today frequently positions societal equality as *the* goal and high-technology as *the* solution. “Information and communications technology” (ICT) is too narrow an understanding of the techniques that can foster inclusive innovation, and socio-economic considerations too focused.⁷ Given this, we argue that inclusive innovation should be understood as having (1) social processes and low-tech solutions – in addition to ICT – as essential means of driving innovation, (2) environmental concerns considered alongside societal aims, and (3) marginalized or underrepresented innovators as being able to include themselves by solving a problem that they are experiencing. Problem-owners are understood here as the affected individuals, groups, and communities themselves.

The book shares case studies and stories of inclusive innovation, primarily from across Southeast Asia. We focus on Southeast Asia for three reasons.⁸ First, the region’s dynamism has produced compelling examples of inclusive innovation. Second, the innovation that has fueled the region’s economic growth has also increased inequality and environmental challenges.⁹ Hence, there’s a heightened need for innovation that addresses these challenges. Our third reason is that existing research has focused on inclusive innovation in Africa, Europe and North America. Just as the AT movement resisted the flow of technologies from the US and Europe to developing countries, so do we contend that inclusive innovation should be conceived of, and advanced, in local contexts. Thus, our focus on Southeast Asia, a dynamic, emerging region with ample need for inclusive innovation, which is understudied in terms of inclusive innovation policy and practice.

Defining inclusive innovation

We begin by defining inclusive innovation. First, let’s break the term into its two parts. “*Inclusive*” refers to a feeling of belonging, of self-determination. The *Oxford English Dictionary* says simply that it is *not excluding any of the parties or groups involved in something*. Social justice activist Verna Myers explains symbolically that the difference between diversity and inclusion is one of being invited to the dance (diversity) and being asked to dance (inclusion).¹⁰ Inclusion, then, is about a sense of belonging and an ability to participate in the decisions that shape our lives, and our lives within families, neighborhoods, and cities.

Inclusion can be in reference to many intersectional demographic characteristics, such as disability, ethnicity, gender, race, religion, or sexual-orientation. It can also be in consideration of socioeconomic position, in geographic terms, or in terms of industry and sector. To summarize, we think of inclusion broadly. It can be understood in terms of demographic traits, but also in spatial and industrial terms, and crucially, at the intersection of these different characteristics.

The other half is “innovation,” which is derived from the Latin word *novus* meaning new.¹¹ Innovation has commonly come to be understood as the development and application of novel products or processes.¹² This includes invention, the filing of patents, and other technology-driven activity, as well as a range of social and management practices, such as new business models. Innovation, in its various incarnations, is essential to achieving economic goals including, yet not limited to, productivity gains, the growth of Gross Domestic Product (GDP) and quality of life improvements.¹³ The challenge, though, is that while innovation is often considered to be a solution for many challenges facing humanity, it can also cause unintended and even negative consequences.¹⁴

Together, *inclusive innovation* refers to new products, or processes, that strive to improve the lives and livelihoods of problem-owners, marginalized individuals, and often excluded groups (by those actors, rather than for them). The manifestation includes boosting the more equitable distribution of economic gains, and making progress on environmental and societal challenges. There is increasing awareness of unequal rates of participation in innovation, such that women, transgender and nonconforming, ethnic minorities, differently-abled people, immigrants, and those from disadvantaged socioeconomic backgrounds are underrepresented in sectors and roles that produce and benefit from innovation.¹⁵ To begin to remedy this inequity, inclusive innovation places problem-owners as problem-solvers, and in so doing, strives to increase participation in, and benefit from, innovation across demographic, geographic, and industrial domains.

Several terms refer to innovation that has the environment, equity, and societal missions in mind.¹⁶ Table 1.1 alphabetically lists the definitions of these related concepts and details the associated key thinkers and publications.

In order to bring these terms together in the context of our understanding of inclusive innovation, we outline the “unjust equilibrium” that motivates each.¹⁷ An unjust equilibrium refers to stable conditions that cause or exacerbate exclusion, marginalization, or suffering. They begin when policymakers, problem-owners or practitioners observe an injustice, one that they want to work to overhaul, toward a more just equilibrium. Given the observation of the unjust equilibrium, inclusive innovators are motivated to act in order to direct innovation attention and resources in a way that the market economy, if left to its own instincts, would not.

We emphasize the case for an understanding of inclusive innovation that places agency and contingencies at the center. Taking a Foucauldian approach to power relationships, we contend that innovators can “include themselves” rather than rely on others to include them or solve their problems. Hoffecker, in a similar way, defines inclusive innovation in the context of her research on agricultural systems as “a collaborative and co-creative multi-stakeholder approach,” emphasizing agency and leadership by those traditionally excluded as central to inclusive innovation.¹⁸ Dey and Gupta take a

4 *An introduction to inclusive innovation*

Table 1.1 Related terms to inclusive innovation (listed in alphabetical order)

| <i>Term</i> | <i>Description and key authors</i> |
|--|--|
| AT | A movement that emphasizes the application of technologies that are suitable to local social and economic conditions that have environmental considerations in mind and that encourage self-sufficiency on the part of those who use them. ⁵⁰ Here we also include decolonial innovation ⁵¹ and place-based innovation, ⁵² which both emphasize fit with local context. |
| Assistive technologies | Describes “products or systems that support and assist individuals with disabilities, restricted mobility, or other impairments to perform functions that might otherwise be difficult or impossible.” ⁵³ Here we also note “disability justice.” |
| Distribution-sensitive innovation | Considers distributive implications in terms of demographic, industrial, or societal dimensions. ⁵⁴ |
| Frugal innovation | Innovative products are stripped of nonessential features in order to be made available by and for poor consumers; Prabhu defines frugal innovation as “the creation of faster, better, and cheaper solutions for more people that employ minimal resources.” ⁵⁵ |
| Grassroots innovation | Emphasizes bottom-up solutions by individuals and communities to solve local challenges. Seyfang and Smith define it as “a network of activists and organizations generating novel bottom-up solutions for sustainable development and sustainable consumption.” ⁵⁶ The Grassroots Innovation Augmentation Network (GIAN) defines it as “a modality of inclusive innovation that enables extremely affordable, niche-adapted solutions to local problems, often unaided by the public sector or outsiders.” |
| Green innovation | Also called “eco-innovation,” “climate innovation,” or “environmental innovation.” refers to “new products, processes or methods that, over the course of their life cycles, reduce environmental risks, pollution, and the negative impacts of consuming resources.” ⁵⁷ “Blue innovation” is a subset term, referring to innovation that targets ocean health and sustainability. |
| Mission-oriented innovation | A form of innovation policy that focuses on achieving a societal goal, or mission, such as reducing carbon emissions. ⁵⁸ Also called “mission-driven” or “transformative” innovation as well as “tech for good.” |
| Open innovation | Concept was popularized by Henry Chesbrough, referring to the changing dynamics whereby firms increasingly rely upon external resources and logics, and ecosystems are characterized as having greater collaboration across actors. ⁵⁹ |

Table 1.1 Cont.

| <i>Term</i> | <i>Description and key authors</i> |
|--|--|
| Responsible research and innovation (RRI) | An approach that aims to anticipate and assess potential implications and societal expectations with regard to research and innovation. The concept was popularized in the early 2010s through the EU's framework programs, which sought to hold research to high ethical standards and ensure that policymakers took responsibility for avoiding harmful effects of innovation, including by engaging the communities affected by innovation. ⁶⁰ |
| Rural innovation | Innovations serving farmers and people in rural areas. This form of innovation has both its demand and supply situated in its rural context. ⁶¹ The idea of "household innovation" is also included here. |
| Social innovation | Innovation activities that are "motivated by the goal of meeting a social need and that are predominantly developed and diffused through organizations whose primary purposes are social." ⁶² We mention "civic innovation" as a related term focused specifically in the context of the civil or public realm. ⁶³ |
| Systems innovation | Can be considered twofold in responding or realizing an opportunity connected to a complex problem "First when society faces a systemic challenge which requires a systemic response. Second, when society has a systemic opportunity to create a new kind of system." ⁶⁴ Here we also include human-centered design (HCD) ⁶⁵ and "design for the pluriverse" as related concepts, and potential components of some systems innovations. ⁶⁶ |

similar tack by stressing that "innovations *from* grassroots are distinct from innovations *for* grassroots," in terms of their frugality, inclusivity, and sustainability.¹⁹ Typically, grassroots innovations arise from a lack of resources and they generally address needs at the bottom of the pyramid (BoP) where formal structures or interventions are insufficient. These types of innovations are considered inclusive in that they inherently involve solutions from those who experience the challenges. They can draw on local materials or second-hand parts, and this can (but does not necessarily) offer an environmentally sustainable nature.²⁰

The myriad promises of innovation have led to the development of multiple approaches that consider the social purpose of innovation, the distribution of its benefits, and the relationships of those involved. We see three motivations underlying inclusive innovation, as illustrated in Table 1.2.

The issues of direction, distribution and participation are interconnected. Some of the language used in Table 1.1 aligns with one of these core rationales, while others sit at the intersections. AT, for instance, involve both distributive

Table 1.2 Three unjust equilibria motivating inclusive innovation

| | <i>1. Participative</i> | <i>2. Distributive</i> | <i>3. Directive</i> |
|---------------------------|---|---|--|
| Unjust equilibrium | Insufficient participation in, or benefit from, the production of innovation. | Innovation can cause – and accentuate – inequality. | Innovation, without purposeful redirection, often aims at financial – not necessarily environmental or societal – gains. |
| Related concepts | Frugal and grassroots innovation. | Distribution-sensitive innovation and RRI. | AI, green, grassroots, mission-oriented, systems, and social innovation. |

and directive, as they advocate for innovation that is drawing on local labor and limiting environmental degradation.²¹

A brief history of inclusive innovation in Southeast Asia

Early inclusive innovation studies and initiatives in Southeast Asia emphasized the socio-economic dimension, especially in targeting BoP consumers.²² From 2008, inclusive innovation efforts in Southeast Asia tended to center on engaging poor and rural communities. The focus on the BoP was evident in major initiatives in the region, such as the 2010 Krabi Initiative on Science, Technology and Innovation for a Competitive, Sustainable, and Inclusive ASEAN.²³ The initiative articulated a policy framework for collaboration across ASEAN and the EU that aimed to balance considerations of economic competitiveness and human development. It strived to promote innovation that included wider segments of society (i.e., youth and the BoP) as producers. Promoting inclusivity in business was articulated as a broader aim in the 2017 ASEAN Inclusive Business (IB) Framework. The ASEAN initiative applied a G20 definition of inclusive businesses as referring to businesses that

provide goods, services, and livelihoods on a commercially viable basis, either at scale or scalable, to people at the Base of the economic Pyramid (BoP),²⁴ making them part of the value chain of companies' core business as suppliers, distributors, retailers or customers.²⁵

Over time, the concept has been taken further, more purposefully involving people and places that are otherwise marginalized from innovation processes, and focused not just on the BoP. The emphasis, increasingly, evolved toward issues of geographic inclusion, encouraging innovation in rural areas. Recent initiatives, such as the Philippines' Inclusive Innovation Industrial Strategy and the Regional Inclusive Innovation Centers, strive for collaborative,

systems-based approaches organized around bringing together a variety of individuals and organizations, such as academia, grassroots innovators, large firms, local government, small and medium-sized enterprise (SMEs), and social enterprises.²⁶

Globally, the use of the phrase inclusive innovation has increased over time. Google Search Term Analytics for “inclusive innovation” from 2007 to 2020 show growth, at the world level, through 2019, and then a moderate drop in 2020. Google Search Term Analytics for each of the 11 Southeast Asian countries, though, only produced results in two countries: Malaysia and the Philippines. In Figure 1.1, we can see the significant uptake in the Philippines since 2016, and more sporadic usage of the term in Malaysia, with a spike in 2012 but then no activity until 2017 and 2018.

In large part, governments and international organizations – particularly the United Nations (UN) and World Bank – have been responsible for convening this increased interest in, and use of, inclusive innovation in select Southeast Asian countries. Governments have taken up efforts to advance

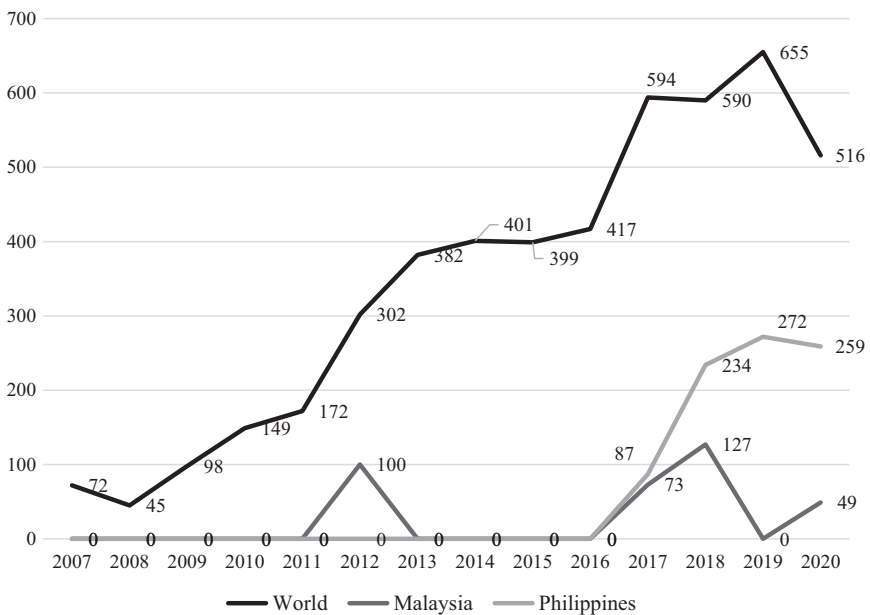


Figure 1.1 Google search term analytics for “inclusive innovation,” 2007–2020

Source: Data was gathered separately for “World” and then each Southeast Asian country individually: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste, and Vietnam. Only Malaysia and the Philippines are included in the figure because they are the only two countries that produced any results. This is, of course, not a definitive account of the use of the term (because of language issues, Google usage differences across countries, etc.), but one indicator of its prevalence and relative increase over time.

inclusive innovation through a variety of policy initiatives. As an example of an implemented policy in Southeast Asia, the Philippine Inclusive Innovation Industrial Strategy (i3S), which was first introduced in 2017 and helps explain the rise in Google results for the Philippines, encourages innovation that takes a wider view of who is conceived of as an innovator.²⁷ The Philippines' initiative, as well as others underway across the region, aims to bring together the whole ecosystem, so that grassroots innovators, MSMEs, universities, public research entities, and large firms collaborate to advance innovative solutions to societal challenges. The introduction of the language of inclusive innovation was specifically introduced in Malaysia through the High Impact Project 6 – Inclusive Innovation (HIP6) program, which was part of the country's SME Masterplan 2012–2020. Though Vietnam did not feature in the Google results, a similar introduction occurred there, as the World Bank launched the Vietnam Inclusive Innovation Project (VIIP) in 2013.

Since their onset, inclusive innovation policies have included initiatives that focus on the provision of different types of capital. Programs, such as the VIIP, act by directing financial capital, such as research and development (R&D) spending or startup loans, toward underrepresented groups, in an effort to increase their participation in innovation. Another brand of initiatives allocate resources toward human capital, in the form of skills training – for example, coding boot camps, or targeted provision of science, technology, engineering, and mathematics (STEM) education for women, ethnic minorities, and socioeconomically disadvantaged population groups.²⁸ Such provision is based on the presumption that a lack of specialized skills and experience is excluding a demographic group from work in innovative sectors; targeted computer and STEM training programs are provided to help fill the skills gap that is undermining demand from these potential applicants. As a means of boosting human capital in the form of on-the-job experience, quotas have also been set for participation, such as minimum numbers for female representation on boards or in government.

Inclusion of whom? Agency, contingencies, and problem-ownership

In our study of inclusive innovation, we begin with the “who.” The “who” refers to one's feeling of belonging and openness to their involvement.²⁹ With this in mind, and with consideration of the social dynamics at play when we consider “participation,” we acknowledge that equal starting points do not exist for individuals. Identities are fluid and intersectional, and this has an impact on how in-groups and out-groups may be conceived of in an innovation initiative. We define intersectionality here as the way “social identities such as race, class, gender, ability, geography, and age interact to form unique meanings and complex experiences within and between groups in society.”³⁰ In conceiving of the “who”, the view of in-groups and out-groups determines the bounds of “inclusion” and “exclusion.” This carries with it often unseen

power dynamics, which have implications on the extent to which innovation can be participatory. Thus, inclusion can be a politically loaded, nonneutral term that carries notions of power and also social equity, equality of opportunity, and democratic participation.³¹

This leads us to ask: who has agency to drive and be included in change? Whose rules of the game are to be followed, and whose interests are to be prioritized? We are particularly interested in exploring innovation that enhances livelihoods and well-being, which frequently is correlated with the ability to generate income and drive environmental regeneration. Drawing upon a development lens, Amartya Sen explains that contingencies – meaning personal circumstances such as where one is born, the extent to which they have access to resources, etc. – affect the opportunities available to them. Sen asserts, “what we can or cannot do, can or cannot achieve, does not depend just on our incomes but also on the variety of physical and social characteristics that affect our lives and make us what we are.”³² Acknowledging these distinctions helps us consider inclusive innovation in terms of the individuals, organizations, and systems involved, seeking to go beyond the “innovator as hero” narrative and also the presumption that those at the center of the social system are necessary to driving inclusion.

The hero narrative – in which a lone entrepreneur creates and implements an innovation – does not work well in the inclusive innovation domain. As Michel Foucault asserts:

Power is everywhere: not because it embraces everything, but because it comes from everywhere. Power is not an institution, nor a structure, nor a possession. It is the name we give to a complex strategic situation in a particular society.³³

With this in mind we explore the role of intangibles, such as relationships and their inherent power dynamics, in the context of their potential to accelerate or hinder inclusive innovation approaches. We examine means of self-empowerment, not on reliance on some central power.

Agency in inclusive innovation, then, has to do with who are the problem-owners. In inclusive innovation, problem-solvers *are often* the problem-owners. Munoz and Kimmit explain that social problems are defined and solutions are applied through social innovation that stems from, and responds to, the local context.³⁴ The centrality of problem-ownership and local context acknowledges the contingencies that shape one’s ability to participate. Bottom-up problem-owners, often called grassroots innovators, typically operate below the radar and have driven much of the inclusive innovation in practice.³⁵

The Circular Design Lab – launched in Bangkok in 2019 as a volunteer, citizen-driven open innovation “platform” – is a good example of distributed organization and self-empowerment of problem-owners as problem-solvers. It is not technically registered (the community discussed and voted against

this idea), it doesn't have a director, and it doesn't have sustainable funding sources, yet it has been able to run on the energy that the ecosystem community collaboration generates. Since inception, the community has grown to over 500 members with issues addressed in "pop-up" labs. Using systemic design, action research, future design, and ethnographic tools, the community develops experiments, focused on air pollution, unsustainable fast fashion, and waste management, among other challenges that it identifies. Box 1.1 explains more about the Circular Design Lab and its inclusive approach.

Box 1.1 Circular Design Lab

By Courtney Savie Lawrence, Circular Design Lab

Launched initially as an experiment in Bangkok, Thailand, the "Circular Design Lab" is a volunteer, citizen-driven, bottom-up open innovation "platform" that focuses on tackling local environmental and social challenges leveraging a systems approach. The lab is not technically registered; the community discussed, yet voted against this idea, determining that the flat governance structure is what was part of the magic. In this sense, there is no director or a conventional organizational model. We have been able to harness microgrants for materials and volunteers for execution that have been leveraged for specific workshops, events, and ecosystem gatherings. What has been fascinating is the way the lab has been able to run on the energy that the community collaboration generates.

What brought us all together in the first place? A small group of faculty from a local university wanted to investigate the core drivers of entrenched climate and social justice issues in our own backyard of Bangkok. We were curious if others would also agree that it is our collective civic role to tackle the "badly managed commons" challenges. Our hypothesis was anchored in this question: could we curate a community of practice around tackling wicked problems from a systems perspective? Of course, we also wondered if the issues would prove too large a scale. Or would we feel too small and removed from really being able to affect change.

The Circular Design Lab now holds over 500 members, and since inception much of our work has focused on prototyping and delivering informed responses (we shy away from the language around "solution" too much) to challenges including waste management, plastics, and air pollution, as well as food and fashion supply chains – these themes are nominated and selected by the community. By working with an ecosystem approach, we often hold gatherings to connect the social capital

dots. This looks like panel discussions, systemic design workshops, pop-up zero-waste happy hours and design studios. Going back to our first “lab case” where we focused on the Waste Management System in Bangkok, we had three teams collaborate to develop prototypes based on workshop-surfaced leverage points which ended up informing the ways the teams developed their experiments. One focused on mindsets, another on single-use plastic, and the third, on food waste and recycling systems. After the first lab we had significant momentum and interest so we continued! We were able to cover the cost of space and food for the workshops in the first lab thanks to a seed grant from the Royal Society of the Arts, yet for the second, we had pro-bono local support to continue – so we did – and we included lab topics as well. In the “2.0,” which we held three months after the first round, we added air pollution and unsustainable fashion supply chains. The following year, in 2020, we had support from The Incubation Network to work on ocean plastic challenges as well as food systems, all in accord with our community members interests and notably issues that are problematic for Thailand too.

So how deep does the work go? Do the workshops lead to anything significant in terms of substance or the problem at hand? One example would be the “#Right2CleanAir Road Show”- which emerged from the 2.0 lab series. By partnering with the Thailand Clean Air Network, who attended the lab workshop sessions, we worked on raising awareness for political action through a series of virtual sessions and papers, including the “Clean Air Blue Paper”- an evidence-based case for policy change-which was a gap identified by the community. Throughout the roadshow, which included ten online and offline sessions with simultaneous translation in English and Thai, topics including the economic cost of air pollution, its impact on various facets of life, as well as an inquiry into the gaps between current and proposed solutions. Among the outcomes of the project, certain solutions were proposed, such as creative responses (arts, community and education), responses to the gaps in the system, and democratizing the access to air quality. The overall goal was to use this campaign to drive people to act – and the mechanism to engage with was signing the citizen driven policy mechanism to table the first Clean Air Act to Parliament. Interestingly, in Thailand’s legal code, with over 10,000 citizen signatures such legislation proposals can be reviewed and potentially adopted by the government. At the time of writing there are nearly 25,000 and counting.

For readers curious about process, although we are always evolving the approach (and arguably, COVID-19 required that rethink), at a high level, we facilitate a systemic design approach to surface points that tackle such complex issues. It begins by having groups work together

to gather information regarding the specific problem and its context. We call this co-initializing as it enables individuals to learn from diverse perspectives and discover the challenges and opportunities that can be observed in this field, often through action research and ethnography. Then, co-sensing takes place, where groups assess the data and investigate the driving forces behind these complex issues and start identifying the core drivers and potential leverage points to intervene. We hold space to ‘make sense’ of the collected data and re-imagine what might be possible instead, framing problem statements in the meantime. Third, co-creation. This is the stage where the groups foster, test, and refine the ideas they developed in the two previous stages. They produce prototypes to test locally. Fourth, the co-evolution stage takes place. Stories are shared, including the experiences of each group member where reflection on how they experienced the process and what they learned is critical. The circle is often expanded organically as new connections are made, and previous ones are deepened.

As the Circular Design Lab case shows, systems-based inclusive innovation initiatives require decisions about how to structure the organization, and these decisions affect the nature of hierarchy and inclusion. In addition to questions about how to structure, power dynamics potentially resurface when the problem-owners are not engaged. The innovation space is full of co-creation and co-consensus processes, yet there is a danger to these methods if the actors engage only with understandings and contexts that fit with their own intention.³⁶ In an effort to avoid this pitfall, the Circular Design Lab participants explain that “the goal is to build relevant testing grounds that usher in opportunity spaces, or eventual interventions to shock the system to shift in a new direction.” One of their prototypes has led to the co-championing of the country’s first citizen-driven Clean Air Act – a bottom-up policy process that leads to legislation being tabled at the Thai Parliament. Examples such as the Circular Design Lab respond to the question of who owns “problems” in an inclusive way.

People and planet: ecological integration

Power dynamics and who should, or who can, own the problem is more complex given the centrality of environmental concerns at the core of our understanding of inclusive innovation. In the so-called current “Decade of Action,” the race to accelerate solutions toward the UN Sustainable Development Goals (SDGs) by 2030, there is little questioning the importance of innovation for climate and the environment. Human activity is linked to driving the world’s sixth mass extinction with overpopulation, consumption of resources, and doubling of emissions threatening all corners of the

globe.³⁷ Take, for example, the Philippines, which is vulnerable to the impact of climate change owing to its proximity to the Pacific Ocean's typhoon belt and environmental degradation.³⁸ This manifests as exposure to flooding or droughts, public health risks, threats to biodiversity and food security, loss of livelihoods and human life, among others.

For now, though, there is still focus on people first and the environment second. One of the core challenges, we contend, is to focus on regenerative development, sustainability, and the environment as central to inclusive innovation. This requires a shift away from one where science traditionally siloes human and ecological issues as independent issues³⁹ and returns toward one that sees the environment and society as interdependent, as indigenous and traditional ecological knowledge have done for hundreds of years.⁴⁰ In practice, there are already nature-based innovative solutions evolving, which Cohen-Shacham and co-authors define as actions that are “simultaneously providing human well-being and biodiversity benefits.”⁴¹

The reframe of inclusive innovation – toward people and planet, rather than only social concerns – is challenging given the multiple tragedies-of-the-commons dilemmas.⁴² Tragedy-of-the-commons refers to the tendency for a limited (public) resource, such as the oceans or air, being depleted, as no one person feels responsible for maintaining it or limiting their use. The challenge is that many believe that if others reduce their pollution, or their consumption, the crisis could be averted. As Kate Raworth argues in her book *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*, the answer involves shifting our thinking so that we stay within the planetary boundaries, or “doughnut,” which she conceives of as a social boundary in relation to ecological capacity.⁴³ The doughnut is based on principles of circular design and use, reducing consumption, and becoming more regenerative in order to operate within the boundary.

An example of green innovation that has societal implications is the Liter of Light initiative, which began in the Philippines. The Liter of Light began in places such as remote islands, where electricity grids do not fully reach all communities and houses, and in those on the grid, where brownouts occur frequently. The insecure access to electricity left residents without light and, as such, they either need to be outdoors, in the heat and sun, or inside, in the dark. At the same time, the creators of Liter of Light noticed that there was significant waste caused by single-use plastics, particularly bottles. Plastic bottles, in some places, were littering towns and waterways. These two disparate problems – insufficient access to energy and environmental degradation due to plastic waste – are the issues that Liter of Light solves.

The Liter of Light innovation solves the problems by taking every day plastic bottles and cleaning them, and filling them with water and chlorine. The bottles are then inserted into a circular hole on the roof of a home. When the sun shines, the mild chemical reaction in the bottle creates usable light on the inside of the building. This means that electricity cables, or generators, are not needed and plastic waste is reduced and infused with

new purpose. More than that, a new brand of “green jobs” has been created around the installation of the liters. So, the Liter of Light innovation offers an inexpensive, and low-tech, solution to the problems of insufficient indoor light and plastic waste.

Liter of Light is similar to other initiatives in its twin aims, as a growing number of inclusive innovations provide better conditions for both people and the planet. Take, for example, Gaz Lite, a liquefied petroleum gas canister developed by Filipino firm PR Gaz to solve the problem of indoor air pollution from the use of solid fuels such as wood and charcoal. Benefits are multifaceted: the canisters offer better health, shorter cooking times, lower household expenses, and micro-entrepreneurship opportunities (PR Gaz has set up over 800 community stores as canister retailers).

Another example of waste reduction, environmental regeneration, and livelihood gains is Pasar Sejahtera, based in Indonesia. Pasar Sejahtera (translation means “prosperous market”) aims to improve pasar (markets) as physical spaces, in order to encourage more local people to shop there rather than in modern supermarkets (which are less tied into the local economy and community). This is achieved by innovating waste management processes, in the form of inorganic “waste banks” and composting facilities, which help markets meet hygiene standards and provide financial opportunities for traders. Locals receive cash in return for waste they deliver to the banks, which they can then use to build their business. Other measures include the formation of trader and laborer cooperatives, and education on financial literacy, health, and sustainability.⁴⁴

The potential scale of engagement with Pasar Sejahtera is sizable: 12 million people in Indonesia rely directly on traditional markets for their income, with 50 million (almost a fifth of the population) relying on them indirectly. This makes the sector the second biggest in terms of employment after agriculture. Efforts to improve livelihoods here thus have the potential to bring great benefit to a significant number of households. Reflecting the importance of the initiative, President Joko Widodo identified traditional markets as a part of his Nawacita (“nine-point”) development program for Indonesia in 2014. This election pledge has been developed into a national market revitalization program (Revitalisasi Pasar Rakyat), launched by the Ministry of Trade in 2015 with the aim of developing 5,000 such markets across Indonesia.

Our inclusive innovation framework

Our inclusive innovation framework centers around the understanding that (1) inclusion is necessarily about people *and* the planet, and so ecological concerns need to be at the center, (2) innovation should be understood more broadly than information technology, so that low-tech and social organization innovations are equally counted, and (3) innovation is a collaborative process in which problem-owners are crucial problem-solvers.

We study inclusive innovation by focusing on the questions underpinning the source and the means of innovation, in terms of their *how*, *what*, and *where*. For us, as discussed in the previous section, the “who” is understood as the problem-owner and is at the center of any initiative. The “why” of inclusive innovation, as with the related terms we canvassed, has to do with the observation of an unjust equilibrium; the desire to address a locally-experienced environmental and social challenge. Knowing the “who” and “why”, our framework turns to examining inclusive innovation according to its how, what, and where.

1. **How: innovation by and for problem-owners** aims to enhance the quality of life and work in local communities, regions and sectors experiencing challenges. Initiatives might seek to improve institutions, processes and workplace technologies toward greater productivity and higher incomes, or upgrade the infrastructure of people’s daily lives in order to enable an improved experience (be that via access to employment, or through better health). These innovations are characterized by their enabling effect, in that they provide better conditions by and for marginalized or resource-scarce groups. It also constitutes social innovations – or creative, collaborative and process-based solutions – to societal challenges.
2. **What: innovation for environmental and social good** involves the development of technology-based solutions to address social or environmental challenges such as waste collection, education provision, low incomes in the agricultural sector, or infrastructure issues facing excluded groups. In line with the antecedents to inclusive innovation – particularly AT – we focus on technology as broader than information and communications technology and a key medium for helping to ameliorate complex challenges. Consumers of these types of innovations receive products and services that are affordable and tailored to their needs and circumstances, improved market access, and enhanced opportunities to use innovative approaches and tools that can boost their incomes.
3. **Where: innovation everywhere** refers to interventions where innovative activities are intended to be further geographically distributed, both in their development and in their application. This approach sees innovation as an economic and social process, designed to broaden access in spatial terms. It offers, in principle, a systematic means of creating regionally spread development and greater shared prosperity, typically to rural, mountainous, or socioeconomically disadvantaged areas (including in urban settings).

This delineation of dimensions according to how, what, and where is akin to Schillo and Robinson’s mapping of inclusive innovation in developed country contexts in terms of the “big five” questions.⁴⁵ Figure 1.2 offers a visual summary of the three domains of our framework.



Figure 1.2 Our inclusive innovation framework
Source: Visualized by Pushpin Visual Solutions.

To help operationalize these approaches, Table 1.3 distills each into their rationale, target issue, or group, and links them to the related concepts.

The rationale for acting and determining whether efforts are focusing on the how, what, or where are central to our framework. Stemming from this, we detail the target issues or groups for the efforts. In this way, the “rationale” is akin to frameworks that emphasize direction, participation, and governance.⁴⁶ The “related concepts” column helps us to connect the activities with other concepts discussed.

As the table shows, there is overlap across target issues and groups as well as the related terms. This overlap represents the intersectional nature of the issues addressed, similar to the way that Planes-Satorra and Paunov conceive of industrial, social, and territorial types as interrelated forms of inclusive innovation.⁴⁷ For example, grassroots innovation can manifest in each of the types, depending on whether the emphasis is on the technological medium, on solving environmental challenges encountered by rural, or disconnected populations (such as the remote islands in the Philippines which we illustrate in Chapter 4), or solutions developed by low-income communities as a means of reducing waste.

Table 1.3 Our inclusive innovation framework: how, what, where

| | <i>Rationale</i> | <i>Target issues or groups</i> | <i>Related concepts</i> |
|--|---|--|---|
| 1. How: innovation by and for problem-owners | The process of innovation should be inclusive, by problem-owners, often in collaboration with multiple stakeholders, rather than heropreneurs acting alone to address others' challenges. | <ul style="list-style-type: none"> ● Climate change and related vulnerabilities. ● Disadvantaged socioeconomic areas and groups. ● Environmental degradation. ● Low-income individuals. ● People with disabilities. | <ul style="list-style-type: none"> ● Assistive technologies. ● Barefoot entrepreneur. ● BoP. ● Frugal innovation. ● Grassroots innovation. ● Green innovation. ● Mission-oriented innovation. ● Open innovation. ● RRI. ● Social innovation. ● Systems innovation. |
| 2. What: innovation for environmental and social good | Technology-based solutions can exacerbate inequality and exclusion, but also ameliorate inequality and drive environmental benefits. | <ul style="list-style-type: none"> ● Increase participation of underrepresented demographic groups. ● Advance the productivity of low-tech sectors. ● Rural and disconnected areas. | <ul style="list-style-type: none"> ● Assistive technologies. ● Appropriate technologies. ● Green innovation. ● Mission-oriented innovation. ● RRI. |
| 3. Where: innovation everywhere | Innovation needs greater spatial reach, in terms of where it occurs, in order to address challenges in rural and urban arenas. | <ul style="list-style-type: none"> ● Climate change and related vulnerabilities. ● Low-income or low-productivity areas. ● Rural and mountainous regions. | <ul style="list-style-type: none"> ● Distribution-sensitive innovation. ● Grassroots innovation. ● Green innovation. ● Place-based innovation. ● Rural innovation. ● Social innovation. |

Data and methods

The book's analysis draws on three sets of inputs. First, interviews with more than 50 practitioners and policymakers were conducted across the region, which included (pre-COVID-19) interviews across Southeast Asia in August and September 2019. These interviews provided us with rich insights that we hand-coded in order to identify emerging themes and patterns. The coding of interview data helped us to develop our initial understanding of various approaches to inclusive innovation in emerging market contexts, especially in Southeast Asia.

Second, in order to develop a comprehensive understanding of contemporary practice, we compiled a novel dataset of inclusive innovators operating across all 11 countries in Southeast Asia: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste, and Vietnam. To identify the inclusive innovators, we developed a set of inclusive innovation keywords (our "dictionary"), as identified in our literature review and through our interview data. We combined different terms from the dictionary – along with country names – to create the following search strings:

- Innovation / entrepreneur / technology.
- Inclusion / inclusive / inclusivity / participation / underrepresented / participate / employment / job / work / consumer / producer / underserved / livelihood.
- Grassroots / social enterprise / civil society / community / startup / policy / initiative / government.
- Poverty / poor / disadvantaged / marginalized / low-income / unbanked.
- Gender / women / girls / race / ethnicity / ethnic minority / indigenous / age / youth / elderly / limited mobility / disabled people / amputee / sex worker.
- Traditional / handicraft / artisan / fisher / farmer / grower / rural / remote.
- Sustainable / sustainability / environment / green technology / climate change / SDG / waste / upcycling / recycling / circular / pollution.
- Social challenge / societal challenge / SDG / mission / purpose.

Searches combining these keywords into strings were conducted on Google in both English and in local languages in each country. Finally, these searches led us to identify specific organizations, and also led us to accelerators and incubators focused on inclusive innovation. When our search strings helped us find one of these types of initiatives, or entrepreneurship support organizations, we scanned it with a view to then include its participants in our list. We included a number of such inclusive innovation support organizations, including the Social Venture Lab at the National University of Singapore and the Youth Co-Labs run by UNDP across the region.

Results were then hand-coded for their organization type: (1) grassroots innovator, (2) MSME / SME, (3) startup, (4) funder / investor, (5) large firm,

(6) civil society or community organization, and (7) government / international organization.⁴⁸ Each qualifying organization – across these seven types – was added to our dataset, and further details coded. We gathered the name(s) of the founders or executives, their gender, title, professional biography, country, social media details (Twitter, Facebook, LinkedIn), and organization websites. Gathering these details ensured that we had a variety of voices according to the country, organization type, etc. Once the database was complete, we then shared it with ecosystem support organizations and champions (nodes and networks themselves) across Southeast Asia, to ask for their additional recommendations and critique. This led to the identification of more contacts working across countries in the region, as well as interesting conversations about how to qualify, or in some cases disqualify, an entry.

In total, the dataset was finalized with a total of 199 Southeast Asian inclusive innovation ecosystem entries. We coded each individual (those who champion and/or implement inclusive innovation whom we refer to going forward as an “innovator”) for the type of inclusive innovation to which their efforts were most closely aligned: “how,” “what,” or “where.” In addition, each coder provided a rationale as to why this coding decision was made. Some organizations had multiple types coded, reflecting the intersectional nature of its aims and activities. This helped in three ways. First, it produced a more systematic sense of the orientation of a variety of inclusive innovation efforts. This helped us to understand if there were inclusive innovators primarily focused on one type more than the others. Second, it gave us another chance to test our typology, to see how it could be applied to nearly 200 inclusive innovators. Third, and more tactically, it helped to inform the way we organized the distribution of case studies and stories throughout the book.

Our third data source stems from a series of (Zoom-based) Inclusive Innovation Stories and Learning Labs that we led between April and June 2021 to gather insights into the practice of inclusive innovation from across South and Southeast Asia. In addition to sharing their stories directly, the labs also helped us to test and validate the themes that emerged through the two other stages. The Labs had a total of 35 participants that resulted in 7 stories and 20 case studies. In addition, we collaborated with a Philippines-based visual note-taking firm (Pushpin Visual Solutions), who helped us distil key insights from each story and from the lab plenary discussions. With these stories, included as “call-out boxes” in the authors’ own voices, we create space to hear directly from a variety of people who are advancing inclusive innovation. And, through their stories, we aim to bring the subject together – and to life – for the reader.

It is important to us to ensure that our findings resonate with those *doing* inclusive innovation. So, over the course of the project we presented our findings, and had ongoing conversations, with our burgeoning inclusive innovation community. This includes the participants in our stories labs, and our interviewees, and also our wider Inclusive Innovation Community of

dynamics and the need to accompany rhetoric with action, so that inclusive innovation is not simply a buzzword.

In addition, there was consensus that the role of actors involved in inclusive innovation is critical. It was essential, according to the participants, to engage “as many stakeholders as possible from all sectors of society” in order to “identify a set of well-researched user needs.” Governance and policy were also named as effective methods for launching inclusive innovation, but the most difficult to practice; “democratizing access” to inclusive innovation was another concern raised. Avoiding an “inclusive gap” and having “innovation as a mindset” were several pieces of guidance given to quell concerns. Overall, an overlapping theme that emerged was ensuring that it wasn’t just innovation taking place, but that it was inclusive, participatory, and had a visible impact.

The third question in the poll was, “What is the best example of Inclusive Innovation you can think of in your context?” The wide range of answers given could be organized into two categories: (1) providing marginalized groups with skills/training, or (2) innovative technology. In terms of marginalized groups, there were mentions of participatory design labs, training, and skills workshops specifically for women. The second category, technology-based inclusive innovation, included solutions such as mobile banking, financial inclusion programs, and mobile markets for ethnic minority groups. There was also the theme of changing entire systems, including social security, so that it would be inclusive of those in rural areas and provide equal protection regardless of geographic location.

We then received feedback on the initial typology through the UNDP-Nesta (online) report launch event in March 2020, and the ensuing one-to-one discussions with various stakeholders afterwards. Finally, we began each of the Learning and Stories Labs (between April and June 2021) by outlining our inclusive innovation framework, and asking participants to reflect on if, and how, their own experiences align with the typologies.

As we worked with our storytellers, our understanding of the three types – and how they have been evolving in light of the COVID-19 pandemic – necessarily evolved and deepened. The time period for data collection and story development was longer, and more digital, than we had originally anticipated. In the end, we are grateful for this additional time as it has given us an opportunity to glean the perspective of more storytellers and stakeholders in higher fidelity and enriched our understanding of the rationale and operations of inclusive innovators across the region. In particular, the book now reflects the inspiring ways in which inclusive innovation is bolstering the response to the COVID-19 pandemic and the centrality of empowering problem-owners as problem-solvers.

How the book is organized

There are five chapters and we have written the book so that you can read them in any order, focusing on stories and themes that you are interested in. Chapters 2 through 4 are thematically-organized, offering stories and

concepts-in-practice from across the region, according to the following three approaches to inclusive innovation:

- How: innovation by and for problem-owners.
- What: innovation for environmental and social good.
- Where: innovation everywhere.

Each chapter includes stories to bring inclusive innovation to life and to distil the ways in which inclusive innovation has evolved. The chapters are organized in sections that answer key questions in terms of how, what, and where; we then close each chapter with a section which breaks down (a) who is involved, and how, as well as (b) strengths and shortcomings. In each chapter, the “who is involved” is covered in order of Academia, Civil society, Funders and investors, Government and international organizations, Grassroots innovators, Large firms, Startups and SMEs. The stories show how inclusive innovation is not a linear journey; as they illustrate, there are wins, personal challenges, and many points for pivots and learning. We hope that these stories help to show you the reality of inclusive innovation in a way that is honest and inspiring.

In Chapter 5 we draw together the theory, policy, and practice of the future of inclusive innovation. It has been our experience throughout fieldwork, labs, and presentations that the lack of a shared language is an issue that has undermined the ability for those doing inclusive innovation, and those writing about it, and designing policy to enable it, to come together. To help foster a common understanding, the final chapter distils key debates and conceptual understandings in the language of inclusive innovation. We explore the future of inclusive innovation, especially in the post COVID-19 pandemic context, and also offer a horizon scan of what is to come in the future of inclusive innovation. This means reimagining how the notion of inclusive innovation can be further fit for future purpose.

Throughout the book, our key themes will appear. First, that inclusive innovation needs to consider people *and* the planet. The emphasis of inclusive innovation in recent years has been focused more on people, initially in terms of the BoP, and then other demographic traits. Our contention is that inclusion is fundamentally an intersectional notion; we cannot fully address societal challenges – especially in a distributive sense – if we are not integrating ecological considerations. Second, we advocate for an understanding of inclusive innovation that sees technology as an enabler for delivery of environmentally and socially good outcomes, rather than an end in itself. We see inclusive innovation as going “beyond Silicon Valley”⁴⁹ in placing people and the planet first, and drawing on a wide range of technologies, rather than information and communications technology, as the AT movement did. Third, drawing on a Foucauldian understanding of power relations, we assert the need for inclusive innovation to emphasize problem-owners as crucial problem-solvers.

Inclusion is not to be done by someone else, but rather, inclusive innovation is by, and for, oneself.

Notes

- 1 Elena Martellozzo, “Life is digital by default – so what’s the impact on young people’s mental health?” LSE Blog, December 21, 2020. <https://blogs.lse.ac.uk/medialse/2020/12/21/life-is-digital-by-default-so-whats-the-impact-on-young-peoples-mental-health/>; Rainer Kattel and Mariana Mazzucato, “Mission-oriented innovation policy and dynamic capabilities in the public sector.” *Industrial and Corporate Change* 27, no. 5 (2018): 787–801; Susan Cozzens and Dhanaraj Thakur, *Innovation and Inequality Emerging Technologies in an Unequal World* (London: Edward Elgar, 2014); William Lazonick and Mariana Mazzucato, “The risk-reward nexus in the innovation-inequality relationship: who takes the risks? Who gets the rewards?” *Industrial and Corporate Change* 22, no. 4 (2013): 1093–1128.
- 2 Mark A. Dutz, *Unleashing India’s Innovation: Toward Sustainable and Inclusive Growth* (Washington, DC: World Bank, 2007), xv.
- 3 Carroll Pursell, “The rise and fall of the appropriate technology movement in the United States, 1965–1985.” *Technology and Culture*, 34, no. 3 (1993): 629–637; Nicolas Jequier, *Appropriate Technology: Problems and Promises* (Paris: OECD Development Center, 1976); David Dickson, *Alternative Technology and the Politics of Technical Change* (London: Fontana/Collins, 1974).
- 4 E.F. Schumacher, *Small Is Beautiful: A Study of Economics As If People Mattered* (London: Vintage (1973) [1993]).
- 5 Raphael Kaplinsky, “Schumacher meets Schumpeter: appropriate technology below the radar.” *Research Policy* 40, no. 2 (2011): 193–203.
- 6 Joanna Chataway, Rebecca Hanlin, and Raphael Kaplinsky, “Inclusive innovation: an architecture for policy development.” *Innovation and Development* 4, no. 1 (2014): 33–54; Cozzens and Thakur, *Innovation and Inequality Emerging Technologies in an Unequal World*.
- 7 We strive to show that ICT is just one means of innovation; technological innovation should, we contend, be considered in terms of its broader meaning of the term as a craft or skill, rather than only constituting high-tech or computer-related forms.
- 8 As researchers currently based in Europe, our ability to conduct this research has benefited from our partnerships and openness to those active in, and studying, inclusive innovation in Southeast Asia. Without their support, we would not have access to what is happening on the ground. Our sincere thanks – once again – to all those who took the time to speak to us and share their experiences and perspectives.
- 9 See Amartya Sen, “From income inequality to economic inequality.” *Southern Economic Journal* 64, no. 2, (1997): 384–401.
- 10 Verna Myers, “Diversity doesn’t stick without inclusion.” February 4, 2017. www.vernamyers.com. May 17, 2021. www.vernamyers.com/2017/02/04/diversity-doesnt-stick-without-inclusion/.
- 11 Jack Springman, “Drop innovation from your vocabulary.” *Harvard Business Review*. September 15, 2011. <https://hbr.org/2011/09/drop-innovation-from-your-voca>.

- 12 Peter Drucker, *Innovation and Entrepreneurship* (New York: Harper & Row, 1985); Joseph A. Schumpeter, *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle* (New York: Oxford University Press, 1934); Joseph A. Schumpeter, *Capitalism, Socialism and Democracy* (New York: Harper Press, 1942).
- 13 Philippe Aghion, Celine Antonin, and Simon Bunel, *The Power of Creative Destruction: Economic Upheaval and the Wealth of Nations* (Cambridge, MA: Belknap Press of Harvard University Press, 2021).
- 14 Nitin Nohria and Hemant Taneja, “Managing the unintended consequences of your innovations.” *Harvard Business Review*. January 19, 2021; J.J. Voeten and W.A. Naudé, “Regulating the negative externalities of enterprise cluster innovations: lessons from Vietnam.” *Innovation and Development* 4, no. 2 (2014): 203–219.
- 15 Robyn Klingler-Vidra and Ye Liu, “Inclusive innovation policy as social capital accumulation strategy.” *International Affairs*, 96, no. 4, (2020): 1033–1050.
- 16 Other works on inclusive innovation have also engaged with related terms. For instance, in the following works, the authors speak of grassroots innovation, frugal innovation, and inclusive user-producer interactions: Richard Heeks, Christopher Foster, and Yanuar Nugroho, “New models of inclusive innovation for development.” *Innovation and Development* 4, no. 2 (2014): 175–185; Richard Heeks, Christopher Foster, and Yanuar Nugroho, *New Models of Inclusive Innovation for Development* (London: Routledge, 2015).
- 17 Roger L. Martin and Sally Osberg, “Social entrepreneurship: the case for definition.” *Stanford Social Innovation Review*. Spring (2007): 29–39.
- 18 Elizabeth Hoffecker, “Understanding inclusive innovation processes in agricultural systems: a middle-range conceptual model.” *World Development* 140 (2021): 105382.
- 19 Anamika Dey and Anil Gupta, “Policies and strategies to promote grassroots innovation workbook.” *UNESCAP* August (2020): 5.
- 20 For more on the relationship between frugal innovation, AT, and sustainability, see Martin Albert, “Sustainable frugal innovation: the connection between frugal innovation and sustainability.” *Journal of Cleaner Production*, 237, no. 2 (2019): 117747; Eugenia Rosca, Jack Reedy, and Julia C. Bendul, “Does frugal innovation enable sustainable development? A systematic literature review.” *The European Journal of Development Research* 30 (2018): 136–157; Catherine P. Bishop, “Sustainability lessons from appropriate technology.” *Current Opinion in Environmental Sustainability* 49 (2021) 50–56. Across this and related scholarship, there is a debate about the positive implications of AT for both the environment and society, with scholars finding that there are unintended negative consequences.
- 21 Pursell, “The rise and fall of the appropriate technology movement”; Kaplinsky, “Schumacher meets Schumpeter.”
- 22 Christopher Foster and Richard Heeks, “Conceptualizing inclusive innovation: modifying systems of innovation frameworks to understand diffusion of new technology to low-income consumers.” *European Journal of Development Research* 25 no. 3 (2013): 333–355.
- 23 ASEAN refers to the Association of Southeast Asian Nations.
- 24 For a review of the literature on the BoP, see Krzysztof Dembek, Nagaraj Sivasubramaniam, and Danielle A. Chmielewski, “A systematic review of the

- bottom/base of the pyramid literature: cumulative evidence and future directions.” *Journal of Business Ethics* 165 no. 3 (2020): 365–382.
- 25 ASEAN, *ASEAN Inclusive Business Framework*. August 14, 2017. <https://asean.org/wp-content/uploads/2012/05/ASEAN-Inclusive-Business-Framework.pdf>. 2.
- 26 “Inclusive innovation industrial strategy.” Department of Trade and Industry, Government of Philippines. October 4, 2021. <http://innovate.dti.gov.ph/resources/i3s-strategy/inclusive-innovation-industrial-strategy/>.
- 27 “Inclusive innovation industrial strategy.” Department of Trade and Industry, Government of Philippines. October 4, 2021. <http://innovate.dti.gov.ph/resources/i3s-strategy/inclusive-innovation-industrial-strategy/>.
- 28 Robyn Klingler-Vidra, *Global Review of Diversity and Inclusion in Business Innovation* (London: LSE Consulting and Innovate UK, 2019).
- 29 Myers, “Diversity doesn’t stick without inclusion.”
- 30 Olena Hankivsky and Renee Cormier, “Intersectionality and public policy: some lessons from existing models.” *Political Research Quarterly* 64, no. 1 (2010): 217.
- 31 Theo Papaioannou, “How inclusive can innovation and development be in the twenty-first century?” *Innovation and Development* 4, no. 2 (2014): 187–202.
- 32 Amartya Sen, *Inequality Reexamined* (Oxford: Clarendon Press, 1992).
- 33 Michael Foucault, *Histoire de la sexualité* (Paris: Gallimard, 1976), 93.
- 34 Jonathan Kimmitt and Pablo Munoz, “Re-thinking the ethics of inclusive innovation.” *International Social Innovation Research Conference*, September 2015.
- 35 Chataway, Hanlin, and Kaplinsky, “Inclusive innovation.”
- 36 Soren Vestor Haldrup, “We are experimenting with different approaches to systems transformation – here are five insights.” *UNDP Innovation*. May 14, 2021. <https://medium.com/@undp.innovation/we-have-experimented-with-different-approaches-to-systems-transformation-here-are-five-insights-ae545a2339b1>.
- 37 IPBES, *Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*, E.S. Brondizio, J. Settele, S. Díaz, and H.T. Ngo (ed), IPBES secretariat, Bonn, Germany, 2019; Gerardo Ceballos, Paul H. Ehrlich, and Rodolfo Dirzo, “Biological annihilation via the ongoing sixth mass extinction signaled by vertebrate population losses and declines.” *Proceedings of the National Academy of Sciences* 114, no. 30 (2017): E6089–E6096.
- 38 Max Fisher, “This map shows why the Philippines is so vulnerable to climate change.” *Washington Post*. November 12, 2013.
- 39 Symma Finn, Mose Herne, and Dorothy Castille, “The value of traditional ecological knowledge for the environmental health sciences and biomedical research.” *Environmental Health Perspectives* 125, no. 8 (2017): 085006.
- 40 Shanley Knox and Felicity Tan, “For regenerative impact, social entrepreneurs must first become system entrepreneurs.” *Journal of Regenerative Theory and Practice* (2021): 1–7.
- 41 Emmanuelle Cohen-Shacham, Gretchen Walters, C. Janzen, and Stewart Maginnis (eds) *Nature-Based Solutions to Address Global Societal Challenges* (Gland, Switzerland: IUCN, 2016), xii.
- 42 Mark Van Vugt, “Averting the tragedy of the commons: using social psychological science to protect the environment. Current directions in psychological science.” *Current Directions in Psychological Science* 18, no. 3 (2009): 169–173.
- 43 Kate Raworth, *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist* (New York: Random House, 2017).

- 44 The Pasar Sejahtera program is funded and delivered by independent foundation Yayasan Danamon Peduli (YDP) in partnership with the Ministry of Health and the Ministry of Trade, and has been running since 2010 in 13 sites across Indonesia. Both ministries had previously been involved with pasar in limited capacities, but local government funding for development was very low. YDP provides initial funding and advice on financial infrastructure elements such as waste banks and cooperatives, while Ministries provide training in their areas of expertise. Ministry of Health involvement also includes a mandatory clinic within the market space, and a radio station informing market users on health matters.
- 45 R. Sandra Schillo and Ryan M. Robinson, “Inclusive innovation in developed countries: the who, what, why, and how.” *Technology Innovation Management Review* 7, no. 7 (2017): 34–46.
- 46 The “direction, participation and governance” rubrics are central to Nesta’s work on inclusive innovation. See Isaac Stanley, Alex Glennie, and Madeleine Gabriel, “How inclusive is innovation policy? Insights from an international comparison” (London: Nesta, 2018). Also, Alex Glennie, Isaac Stanley, Juliet Ollard, and Robyn Klingler-Vidra, “Strategies for supporting inclusive innovation” (London: Nesta and UNDP, 2020). Schillo and Robinson, “Inclusive innovation in developed countries” uses similar language, specifically participation, processes, outcomes, and governance.
- 47 Sandra Planes-Satorra and Caroline Paunov, “Inclusive innovation policies: lessons from international case studies.” OECD Science, Technology and Industry Working Papers, 2017/02 (Paris: OECD, 2017).
- 48 The distinction between large firm and SMEs was made on the basis that enterprises can be classified into different categories according to their size; for this purpose, different criteria may be used, but the most common is the number of people employed. SMEs employ fewer than 250 people. SMEs are further subdivided into micro enterprises (fewer than 10 employees), small enterprises (10–49 employees), and medium-sized enterprises (50–249 employees). Large enterprises employ 250 or more people.
- 49 Robyn Klingler-Vidra, *Beyond Silicon Valley: An Inclusive Innovation Model for Southeast Asia* (Bangkok: Regional Innovation Centre UNDP Asia Pacific, 2019).
- 50 Schumacher, *Small Is Beautiful*; Dickson, *Alternative Technology*; Jequier, *Appropriate Technology*; Kaplinsky, “Schumacher meets Schumpeter.”
- 51 Michael Dominguez, “Decolonial innovation in teacher development: praxis beyond the colonial zero-point.” *Journal of Education for Teaching* 45, no. 1 (2019): 47–62.
- 52 Philip McCann and Luc Soete, *Place-Based Innovation for Sustainability* (Publications Office of the European Union, Luxembourg, 2020). DOI: 10.2760/250023.
- 53 UK MHRA (Medicines & Healthcare Products Regulatory Agency), “Guidance: assistive technology: definition and safe use.” February 12, 2021. www.gov.uk/government/publications/assistive-technology-definition-and-safe-use/assistive-technology-definition-and-safe-use.
- 54 Amos Zehavi and Dan Breznitz, “Distribution sensitive innovation policies: conceptualization and empirical examples.” *Research Policy* 46, no. 1 (2017): 327–336.
- 55 Jaideep Prabhu, “Frugal innovation: doing more with less for more.” *Philosophical Transactions A* 375 (2017): 20160372, p. 1. <http://dx.doi.org/10.1098/rsta.2016.0372>

- 56 Gill Seyfang and Adrian Smith, “Grassroots innovations for sustainable development: towards a new research and policy agenda.” *Environmental Politics* 16, no. 4 (2007): 584–603.
- 57 Aghion, Antonin, and Bunel, *The Power of Creative Destruction*, 176.
- 58 Jakob Edler and Jan Fagerberg, “Innovation policy: what, why and how.” *Oxford Review of Economic Policy* 13, no. 1 (2017): 2–23; Johan Schot and W. Edward Steinmueller, “Three frames for innovation policy: R&D, systems of innovation and transformative change.” *Research Policy* 47, no. 9 (2018): 1554–1567; Mariana Mazzucato, *Mission Economy: A Moonshot Guide to Changing Capitalism* (London: Penguin / Allen Lane, 2021).
- 59 Chesbrough coined the term “open innovation” in a 2003 *Harvard Business Review* piece. Henry W. Chesbrough, *Open Innovation: The New Imperative for Creating and Profiting from Technology* (Cambridge, MA: Harvard Business Review, 2003). See also Anne-Laure Mention and Marko Torkkeli, *Open Innovation: A Multifaceted Perspective* (Singapore: World Scientific, 2016).
- 60 Mirjam Burget, Emanuele Bardone, and Margus Pedaste, “Definitions and conceptual dimensions of responsible research and innovation: a literature review.” *Science and Engineering Ethics* 23 (2017): 1–19.
- 61 For more on rural innovation, see Mahroum, Sami, Jane Atterton, Neil Ward, Allan M. Williams, Richard Naylor, Rob Hindle, and Frances Rowe, *Rural Innovation* (London: Nesta, December 1, 2007), 7.
- 62 Geoff Mulgan, Simon Tucker, Rushanara Ali, and Ben Sanders, “Social innovation: what it is, why it matters and how it can be accelerated.” *Skoll Center for Entrepreneurship* (Oxford: University of Oxford, 2007), 8.
- 63 Jorge Saldivar, Cristhian Parra, Marcelo Alcaraz, Rebeca Arteta, and Luca Cernuzzi. “Civic technology for social innovation.” *Computer Supported Cooperative Work (CSCW)* 28 (2018): 169–207.
- 64 For literature on systems innovation, see Barbara van Mierlo, Arni Janssen, Ferry Leenstra, and Ellen van Weeghel, “Encouraging system learning in two poultry subsectors. Agricultural systems” 115 (2013): 29–40; Barbara van Mierlo, Marlen Arkesteijn, and Cees Leeuwis, “Enhancing the reflexivity of system innovation projects with system analyses.” *American Journal of Evaluation* 31, no.2 (2010): 143–161; Charles Leadbetter and Jennie Winhall, “Building better systems: a green paper on systems innovation.” Copenhagen: Rockwool Foundation, October 2020, p. 8.
- 65 Jamie Munger and Rudi Van Dael, *Putting People at the Heart of Policy Design: Using Human-Centered Design to Serve All* (Manila: Asian Development Bank, November 2020). www.adb.org/sites/default/files/publication/643866/people-policy-design-human-centered-design.pdf.
- 66 Arturo Escobar, *Designs for the Pluriverse* (Durham: Duke University, 2018); Ashish Kothari, Ariel Salleh, Arturo Escobar, Federico Demaria, and Alberto Acosta, *Pluriverse: A Post-Development Dictionary* (New York: Columbia University Press, 2019).