Lakhpati Kisan

Transforming Agriculture-Based Livelihoods for Smallholder Farmers in India

Edited by Anjal Prakash, Ashwini Chhatre, Ganesh Neelam, Sujit G Kumar and Apurva Duddu

Innovations, Practice and the Future of Public Policy in India

LAKHPATI KISAN

Agriculture plays an essential role in the growth of developing economies, as agricultural production is key to food security and is closely intertwined with the livelihoods of many. This book explores the lives of smallholder agricultural farmers in India and the dire challenges that agricultural households face.

Focussing on the Lakhpati Farmers initiative, the book examines interventions made by the programme to economically empower farmers and accelerate income growth in the agriculture sector. The programme, initiated by the Collectives for Integrated Livelihood Initiatives (CInI) in the tribal belts of central Indian states, helped farmers earn over INR 100,000 (or one lakh – hence Lakhpati) per annum. The programme engaged with households in 12 districts across 4 states – Jharkhand, Odisha, Maharashtra, and Gujarat – to bring about change through economic empowerment and improve the quality of life of tribal communities. This book documents these initiatives and strategies to meet the aspirations of small and marginal farmers by understanding the ingredients, processes, and challenges involved. The book analyses the programme, examines case studies, and offers ways forward.

Part of the Innovations, Practice and the Future of Public Policy in India series, this volume will interest students and researchers of agriculture and rural development, business management, governance, public policy, development studies, and sociology.

Anjal Prakash is the Clinical Associate Professor (Research) and Research Director at the Bharti Institute of Public Policy, Indian School of Business (ISB), Hyderabad, India.

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Innovations, Practice and the Future in Public Policy in India

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Apurva Duddu is presently a PhD student in Environmental Studies at the Yale School of Environment, Yale University, USA. In her six years of working at the Bharti Institute, she has been actively engaged with projects related to the governance of natural resources, including the Forest Governance project, Initiative on Forest Economy in Himachal Pradesh, and International Forestry Resources and Institutions (IFRI). She has also been developing modules for capturing data on livelihood interventions in agriculture, livestock, and forests delivered through a network of community-based institutions in 4 states of central India, covering ~80,000 households across 17 districts. She has also been instrumental in designing the system for extracting variables of interest from satellite data products under the India Data Portal project.

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Sujit G Kumar is a postgraduate in Rural Development from Ranchi. Sujit has over 29 years of work experience, particularly in the space of intensive livelihood development programmes for small and marginal farmers. During his professional journey, he has gained hands-on experience in planning, designing, implementing, and managing development projects, both at the grassroots level and senior management level in national and international organisations in a multicultural Indian context. He has also engaged closely with diverse stakeholders, including donors, government, civil society organisations, and communities. Since July 2010, he has been with the Tata Trusts as the Regional Manager for Gujarat and also the state lead of CInI, coordinating multi-thematic programme interventions across the tribal districts of Gujarat. His specific areas of interest are in participatory resource management, which facilitates livelihood promotion and environmentally sustainable development.

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Prasanna Modak has been working with the CInI (an associate organisation of Tata Trusts) since 2012. Prasanna has been part of the team in Jharkhand, under the flagship Lakhpati Kisan programme. As an Area Manager, he

is overseeing two Project Implementation Plans (PIPs) in Dhanbad and Deoghar. This covers a cluster of 11,500 households, combining Tundi and Palojori blocks. In addition, he is leading the livestock theme in Jharkhand (small ruminants). Presently, the livestock theme, which is an integral part of the Lakhpati Kisan programme, is active in seven blocks and six districts of Jharkhand. He is a graduate of Burdwan University of West Bengal, India. He also went through the "Transition Leadership Program" for Area Managers, conducted by IRMA and Tata Trusts.

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Ganesh Neelam is a development professional with a total of 23 years of experience. With a degree in geology, he started his career in the groundwater development and management area, integrating with Livelihoods with BAIF, a well-known NGO in India, and spent four years working with tribal and rural communities. In 2005, he joined the Tata Trusts to anchor the tribal-focused initiative, Central India Initiative, in the central Indian tribal belt. He has been one of the key members promoting Collectives for Integrated Livelihood Initiatives (CInI), an organisation focused on the development of tribal and rural communities in central India. Ganesh presently is the Executive Director of CInI, which has designed and is implementing the audacious Lakhpati Kisan programme. Under his leadership, CInI has also been implementing scaled thematic programmes in education, drinking water, health care, and decentralised renewable energy. Ganesh is interested in technology integration overall to address the pain points of rural and tribal communities.

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Anjal Prakash is the Clinical Associate Professor (Research) and Research Director at the Bharti Institute of Public Policy, Indian School of Business (ISB), Hyderabad, India. He has two and a half decades of experience working on water and climate issues focusing on policy research, advocacy, capacity building, knowledge management, networking, and implementation of large-scale and multi-country climate change and development projects in South Asia. His work focuses on urban resilience, gender, and social inclusion issues covering South Asia. Dr. Prakash was the coordinating lead author for the IPCC Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC). He has also been a lead author in the chapter on cities, settlements, and key infrastructure and a cross-chapter paper on mountains in the Working Group II of the IPCC's 6th Assessment Report. In 2019, he was nominated as a member of the Gender Task Group of the IPCC to develop a framework of goals and actions to improve gender balance and address gender-related issues within the IPCC. He also coordinated the cross-chapter box on Gender in the WG II of AR6. Dr. Prakash has published several books and journal articles on water, the environment, and climate issues.

Aditi B. Prasad is a PhD scholar at the International Institute for Population Sciences (IIPS), Mumbai, India. She is currently working on exploring the unpaid work of young mothers in India. During the CInI-BIPP internship, she got the opportunity to interact with programme beneficiaries from Gujarat and Jharkhand, contributing to her understanding of the impact of the

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PREFACE AND ACKNOWLEDGEMENTS

In the sprawling canvas of India's agricultural tapestry, where every furrow tells a story of hope and toil, lies the beating heart of the nation's prosperity. Behind the tranquil façade of rural life, beneath the vast skies and fertile earth, is a narrative of resilience, struggle, and an unwavering quest for a brighter tomorrow. Within this vibrant context, the journey of the book – *Lakhpati Kisan: Transforming Agriculture-Based Livelihoods for Smallholder Farmers in India* – unfolds, a beacon of hope amid the challenges confronting rural livelihoods.

As stewards of this transformative journey, we stand humbled to present a compendium that plunges into the essence of smallholder agriculture in India, offering insights and pathways to a more abundant future. The editors, along with a cadre of esteemed contributors, have meticulously woven a narrative that not only chronicles the saga of the Lakhpati Kisan Initiative but also serves as a guiding star for policymakers, practitioners, and stakeholders invested in the welfare of smallholder farmers.

At its core, the book represents a bold stride towards uplifting households out of the quagmire of poverty – a mission championed by the Collectives for Integrated Livelihood Initiatives (CInI), a flagship endeavour of Tata Trusts. With a vision to usher in an era of prosperity, CInI's "Mission 2020 – Lakhpati Kisan: Smart Villages" programme stands tall as a testament to the transformative potency of collective action and innovative agricultural interventions.

Within the pages of this tome, each chapter unfurls a facet of the Lakhpati Kisan journey, painting a vivid tableau of experiences, obstacles, and victories. From the meticulous blueprint of the programme to its tangible impact

on the ground, readers will traverse case studies that illuminate the path towards augmenting smallholder farmer incomes. The chapters provide the groundwork, offering a panoramic view of the initiative's objectives and methodologies. Further, they delve into the intricate artistry of programme design, providing invaluable insights into the strategic scaffolding that underpins the Lakhpati Kisan Initiative. The book unveils riveting case studies, each spotlighting a unique dimension of livelihood enhancement, from agriculture and livestock to irrigation and gender parity. Authored by luminaries deeply entrenched in the field, these case studies furnish a granular understanding of the hurdles and opportunities intrinsic to rural development interventions.

Throughout this journey, the leitmotif of empowerment reverberates as the narrative pivots from vulnerability to resilience, from stagnation to growth. At its essence, the book transcends the mere augmentation of incomes; it engenders a sense of agency, dignity, and prosperity among those marginalised by the caprices of agrarian life.

As custodians of this compendium, we extend heartfelt gratitude to the tireless contributors whose endeavours have brought this volume to fruition. We also greatly appreciate the unwavering support and collaboration of the Bharti Institute of Public Policy, the Indian School of Business, and the Collectives for Integrated Livelihood Initiatives supported by Tata Trusts.

This book is a testament to the collective effort, dedication, and unwavering commitment of numerous individuals and organisations whose contributions have breathed life into its pages. We extend our deepest gratitude to the smallholder farmers, whose resilience and determination are the cornerstone of the Lakhpati Kisan Initiative. Your trust, participation, and invaluable insights have enriched this endeavour beyond measure.

We offer our heartfelt thanks to the esteemed contributors whose expertise, passion, and scholarly rigour have infused this compendium with depth and substance. Your tireless efforts in crafting compelling narratives and illuminating case studies have been instrumental in shaping the discourse on rural development and livelihood enhancement.

We profoundly appreciate the support and collaboration of colleagues from the Bharti Institute of Public Policy at the Indian School of Business, and the Collectives for Integrated Livelihood Initiatives. Your partnership has been instrumental in bringing this vision to fruition, underscoring the power of collaboration in driving meaningful change.

Special thanks are extended to the team at Tata Trusts for their unwavering support and visionary leadership, without which the Lakhpati Kisan Initiative would not have been possible.

Finally, we extend our heartfelt gratitude to the readers who embark on this journey of exploration and discovery. May the insights gleaned from

these pages inspire action, foster empathy, and catalyse positive change in the lives of smallholder farmers across India and beyond.

Anjal Prakash, Ashwini Chhatre, Ganesh Neelam,
Sujit G. Kumar, and Apurva Duddu

FOREWORD

As a fervent advocate for sustainable agricultural development and a staunch believer in the transformative power of innovative policies, it is an honour and a privilege to pen the foreword for this seminal work on the Lakhpati Kisan initiative.

In the vast expanse of India's agricultural landscape, where the livelihoods of millions are intricately intertwined with the rhythms of the land, initiatives like Lakhpati Kisan stand as beacons of hope, illuminating the path towards a more prosperous and equitable future.

At the heart of the book lies a profound commitment to uplifting smallholder farmers, empowering them with the tools, knowledge, and resources needed to break free from the shackles of poverty and realise their full potential. Through innovative interventions, community engagement, and strategic partnerships, the initiative has catalysed a wave of positive change, transforming the lives of countless farming households across India.

This compendium is a testament to the remarkable journey of the Lakhpati Kisan initiative, offering a comprehensive exploration of its objectives, methodologies, and impact. From insightful case studies to thought-provoking analyses, the pages of this book are replete with invaluable lessons and insights that resonate far beyond the realm of agriculture.

As we stand at a pivotal juncture in history, grappling with pressing challenges such as food insecurity, climate change, and rural poverty, the lessons gleaned from initiatives like Lakhpati Kisan are more pertinent than ever. By embracing innovation, collaboration, and a steadfast commitment to the well-being of smallholder farmers, we can forge a path towards a more sustainable, inclusive, and resilient agricultural future.

I commend the editors, contributors, and all those involved in bringing this compendium to fruition. I urge policymakers, practitioners, and stakeholders alike to heed the lessons contained within its pages. Together, let us harness the power of agriculture as a catalyst for social and economic transformation, ensuring a brighter and more prosperous future for generations to come.

Tushaar Shah,
Emeritus Professor,
Institute of Rural Management Anand (IRMA), Gujarat, India

1

MAKING A SUSTAINABLE DIFFERENCE

The Lakhpati Kisan Initiative

Anjal Prakash, Ashwini Chhatre, Ganesh Neelam, Sujit G Kumar and Apurva Duddu

Introduction

Vintaben Naranbhai Bumbadiya is a marginal farmer from Chota Bamdodara village of Danta block in Banaskantha District of Gujarat. She lives with her husband, mother-in-law, and seven children and holds 0.15 hectares of land. Agriculture is the only source of livelihood for her and her family. Before joining the Lakhpati Kisan Programme (LKP), Vintaben practised traditional farming in the Kharif season, mainly sowing maize with a mix of black gram, pigeon pea, and cotton and, if rainfall was good, wheat in the Rabi season. She earned Rs. 30,000 per year from agriculture.

She joined the Dhannirankar Self-Help Group (SHG), formed under LKP. Vintaben has regularly attended meetings and training on agriculture and women's leadership. After being trained, she cultivated turmeric (one guntha [98.8 guntha is equal to 1 hectare]), onions (two guntha), chilli, brinjal, and tomato (two guntha) on 0.05 hectares. She received seeds, wire, and saplings of vegetables from the programme. Her land yielded 520 kg of turmeric, 700 kg of onions, and 300 kg of chillies, tomatoes, and brinjal. She sold the turmeric to the SAFE producer company at a rate of Rs. 25 per kg for Rs. 12,900, onions in the village and nearby market at a rate of Rs. 25 per kg for Rs. 17,500, and chilli, brinjal, and tomato at Rs. 20 kg for Rs. 6,000. She earned Rs. 36,400 from vegetables on a small parcel of land.

In a developing economy like India, agriculture is taking a backseat with falling yearly growth rates. Pre-COVID-19, agriculture contributed around 5% of India's gross domestic product (GDP) in 2019. While the other sectors fell during COVID-19, the agriculture sector grew 3.4%. It

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employed about 40% of India's workforce as of 2020 and provided essential food security and livelihoods for millions in rural hinterlands (PIB-GOV, 2022).

In 2016, the Indian government shared the vision of doubling farmers' income. A six-year time frame – from 2016–2017 to 2022–2023 – was the timeline for implementing reform measures. The policy defined the roadmap for doubling farmers' income via increased crop productivity, linkage with livestock, increase in production, efficiency of input use in agriculture, crop and farm diversification, and market linkages. The Agriculture Export Policy 2018 was implemented to support the vision of doubling farmers' income by 2022 via exports of agricultural products. The shift in policy was from traditional agriculture to food processing and agriculture exports and creating employment opportunities for a growing young, unskilled or semi-skilled workforce.

The Central India Initiative, one of the flagship initiatives of Tata Trusts, 2001, focuses on the tribal belt in the central Indian states. It strives to bring households out of poverty with increased life choices. To take forward this mission, Collectives for Integrated Livelihood Initiatives (CInI), an organisation promoted by experts and Tata Trusts in 2007, is enabling various livelihood prototypes in agriculture, livestock, non-timber forest produce, and water resource development. Besides livelihoods, CInI has also been working in education, drinking water, and sanitation to support life choices at the household level. The Lakpati Kisan Programme pioneers diverse livelihood models encompassing agriculture, livestock, non-timber forest produce, and water resource development. In 2015, the Trusts introduced "Mission 2020 – Lakhpati Kisan: Smart Villages" through CInI, aiming to transform the tribal landscape by economically empowering 100,000 households across Jharkhand, Odisha, Maharashtra, and Gujarat.

Remarkably, the initiative successfully touched nearly 96,000 tribal households within three years. Over 20,000 tribal families became Lakhpati Kisans through accelerated income growth. The programme fortified community-based institutions, integrating technology-driven solutions like solar pumps, GIS mapping, and education-focused apps. It embraced a holistic approach, intertwining education, water, sanitation, and nutrition interventions with ongoing livelihood activities. Moreover, it established 60 market-linked production clusters, training over 250 tribal entrepreneurs in various fields while creating 2,540 irrigation structures, providing year-round agricultural water for 30,000 households across 12,000 acres (see Chapter 2 for more information).

The programme contributes to the Indian government's vision of doubling farmers' income and works towards this through grounded interventions. This book documents the efforts by CInI to improve farmers' income in four central Indian states.

1.1 The Process of Documentation and the Methodology

Documenting the outcomes of the Lakhpati Kisan Initiative started in 2020. CInI and the Indian School of Business partnered to document the outcomes and learnings. Documenting the experiences included gathering CInI's project implementation team and ISB's public policy think tank, Bharti Institute, which brought on interns to document the cases. The team was assembled to investigate the key questions to evaluate the programme outcomes. The focus was on sectoral outcomes to understand the linkages and challenges, if any, that could be addressed in the subsequent phases of the programme.

The programme's management information system (MIS) was used to gather information and analyse the key shifts in income as documented by the CInI team. It was a mammoth exercise with numerous data points. Apart from this, several people associated with the programme from the community, local leaders, and project personnel were interviewed to cross-verify findings. The numerous internal reports of CInI were a source of data that helped create a storyline around the outcomes.

This chapter provides an overview of the status of agriculture in India and places smallholder agriculture at the centre of the debate. It also shares the positive outcomes through cases from four semi-arid states in India where some of the poorest people live and are engaged in agriculture. The organisation of this book is presented at the end along with an overview of the book and its significant outcomes.

1.2 The Challenges for Agriculture in India

Indian agriculture had a well-connected trade network even before the colonial period. Its past accomplishments were partly influenced by colonialism and slavery during British rule, primarily emphasising cash crops over food grains (Washbrook, 1994). The post-independence period saw severe droughts in 1965 and 1966, when reforms in the agriculture sector took a turn (Tripathy & Prasad, 2010; Evenson et al., 1998). The Green Revolution increased food productivity; however, the benefits were restricted to certain areas with irrigation facilities, whereas most of India is rainfed (John & Babu, 2021; Kasliwal, 2021).

Agriculture plays a central role in the growth of developing economies as it triggers economic growth in food security and comparative advantage in export-led growth in the early stages of development (Byerlee et al., 2009). It accelerates growth in industry. The non-agricultural sectors have a strong growth linkage and multiplier effect on agricultural growth (Mellor, 1998). However, agriculture was never a part of comprehensive agendas for reforms in India. The 1991 policy reform that corrected the exchange rate, reduced industrial tariffs, and introduced delicensing remained restrictive and anti-farmer (Gulati & Saini, 2017). The NSSO's latest annual Periodic

Labour Force Survey (PLFS) report for 2021–2022 (July–June) shows the farm sector's share in the country's employed labour force at 45.5%. That is down from 46.5% in 2020–2021 but still higher than the 2018–2019 low of 42.5% (GoI, 2019). From 1961–1962 to 2019–2020, the contribution of agriculture to GDP has seen a downward trend with a decline of around 50% (Gulati & Juneja, 2022).

Indian agriculture is highly vulnerable to the impacts of climate change, which poses significant challenges to the country's food security and rural livelihoods. Even though agriculture is a significant source of income for almost half the labour force in India, most rural areas have a large number of poor households dependent on rainfall and changing climatic conditions that aggravate the risks of farming (Roy, 2022; Sinha et al., 2022; Bera et al., 2022; Chattopadhyay, 2023).

One of the critical impacts of climate change on Indian agriculture is the changing monsoon patterns. Erratic rainfall, increased frequency of droughts, and uneven distribution of precipitation have become everyday occurrences (Kundu & Mondal, 2022). These changes disrupt the sowing and harvesting schedules, affecting crop yields and quality. Farmers often need help determining the appropriate time for planting, as delayed or early monsoons can result in crop failure. Rising temperatures also have a detrimental effect on Indian agriculture (Saha et al., 2022). Heat stress during critical stages of crop growth can reduce productivity and increase the incidence of pests and diseases (Singh et al., 2022). Extreme heatwaves damage crops, impact livestock health, and exacerbate water scarcity (Balasubramanian, 2023). Climate change significantly affects Indian agriculture through altered monsoon patterns, rising temperatures, and the increased occurrence of extreme weather events. The vulnerability of farmers and the food security of the nation are at stake.

Rainfed agriculture accounts for 55% of the net sown area (139.42 Mha), and 61% of India's farmer population practices this method. It is crucial to the country's economy and food security as it accounts for around 40% of the total foodgrain production (85%, 83%, 70%, and 65% of nutri-cereals, pulses, oilseeds, and cotton, respectively). It supports two-thirds of livestock and 40% of the population. Further, the livelihoods of 80% of small and marginal farmers are impacted. Crop diversity in rainfed regions is striking, with almost 34 major crops grown annually compared to 4 to 5 major ones in irrigated areas. Rainfed farmers follow diverse economic activities, including horticulture, agroforestry, seed spices, medicinal and aromatic plants, fishery, livestock, beekeeping, etc. This diversity imparts greater resilience to rainfed agriculture and diversifies the consumption necessary to address malnutrition concerns.

Rainfed agriculture is practised in various soil types, agro-climates, topography, and rainfall conditions ranging from 400 mm to 1,600 mm per

annum. Complex climatic challenges characterise India's rainfed regions, manifesting as water scarcity for crop production. Rainfall is highly unreliable, both in time and space, with strong risks of dry spells at critical growth stages, even during good rainfall years. Rainfed crops are prone to breaks in the monsoon during crop growth due to water stress (Ministry of Agriculture and Farmers Welfare, 2022).

1.3 How Is This Book Organised?

This book is divided into six chapters following the editorial chapter. It provides a broad overview of the initiative and a case study of the programme's impact in different thematic sectors.

Chapter 2 focuses on the programme design of the Lakhpati Kisan Initiative. The context of the initiative is that agriculture is India's largest workforce employer, and its contribution to the GDP is one of the lowest. According to the Tenth Agricultural Census of India (2015–2016), small and marginal holdings of less than 2 hectares have increased manifold since 2010 and constitute most landholding types in India. India's agriculture is primarily considered subsistence with low productivity. In sum, it does not support the growing population and their aspirations. This is one of the many reasons for rural-urban migration. The changing climatic conditions also bring more stress to an already stressed system. This is more pronounced in semi-arid and tribal regions, which have been excluded from the benefits of enhancements in agriculture, which can be seen in some pockets. Last-mile delivery, poor extension services, and lack of market integration have been the most often quoted reasons for this failure. In 2015, CInI launched the "Mission 2020 – Lakhpati Kisan: Smart Villages" programme in partnership with Tata Trusts. A Lakhpati Kisan earns over Rs. 100,000 per annum, with a three- to four-fold increase in income compared to baseline income from agriculture and allied livelihoods. The programme engages over 100,000 households in 12 districts across 4 states – Jharkhand, Odisha, Maharashtra, and Gujarat. The objective is to bring about irreversible change in the central Indian tribal belt through economic empowerment and to improve the quality of life of tribal communities by introducing prototype layering, water conservation, and irrigation systems through community institutions. The development, strengthening, and handholding of farmer-producer organisations, federations, and other such institutions are significant parts of this programme.

Chapter 3 brings together the enhancement of agriculture-based livelihoods through a production hub approach undertaken by the initiative. It shares the experiences and outcomes of improved agricultural practices integrated with technological innovations and better practices, which have played a critical role in enabling the aspirations of the rural and tribal

communities along with the goals of the Lakhpati Kisan Programme. The focus is on agriculture-based livelihood promotion; the main approach has been to identify the gaps in value chains, mainly in high-value agriculture, and address them through improved practices, quality services, technology integration, and market linkages. The programme runs across 17 tribal blocks/clusters in the 4 states. These tribal-focused areas are poor performers within the states in terms of agricultural yield due to gaps in the agriculture and allied livestock value chain system, lack of linkage to market knowledge, poor quality inputs, poor irrigation facilities, lack of suitable transport and road connectivity, poor financial linkages, poor grid connectivity, etc. Identifying context-specific winner crops has been the first step, based on climatic and soil suitability and market preference. The linkages to better seedling, quality inputs, crop management, etc., are being targeted through a service delivery mechanism by micro-entrepreneurs and women-led enterprises. The federations and FPCs ensure quality services to members, along with crop management and market connections. They are central to building agriculture as a strong business enterprise for smallholders.

Chapter 4 documents the unlocking of irrigation potential in LKP to enable farmers' aspirations. It showcases how CInI has used irrigation as an enabler to improve the agricultural performance of rural areas across different clusters in the four states. It records CInI's efforts towards providing irrigation facilities to a maximum number of households within the selected states through various approaches, interventions, and water management practices. The erratic rains and dry spells, undulating topography of the programme area, excessive runoff and soil erosion, and untreated and poorly managed uplands have left these areas poor in agricultural productivity with high yield gaps. To fulfil the goal of LKP, irrigation played an essential role as agriculture production in rainfed areas depends on the short window of rainfall during the monsoon. Critical irrigation has helped reduce the uncertainty in agriculture. Irrigation has been the underlying cause of the expansion of multiple aspects of agriculture, such as farm produce, livestock, etc. Post-intervention, productivity has increased significantly from 20% to more than double in some instances, though supported by other factors such as improved crop varieties/saplings, better management practices, and enhanced inputs. The cropping intensity and per-household production have also increased. Seventy to eighty percent of the area has been brought under irrigation, whereas earlier, only a single Kharif crop was possible. With the help of "water control", farmers' irrigated land has been converted into cash/high-value crops, and it is seen that an income of Rs. 40,000–50,000 (USD 540–675) is obtained easily from a quarter of an acre under high-value crops. Irrigation interventions are designed to suit local conditions and maximally harness the potential natural water resources existing in tribal areas. Most of the interventions are planned as community assets

that work in an integrated manner at the household level to increase irrigation access and cater to aspirations. Water User Groups (WUGs) manage irrigation assets and water distribution. The introduction of solar pumps as an energy solution and the adoption of micro-irrigation and mulching for efficient water use have been promoted under the programme.

Chapter 5 investigates the practices of livestock rearing in the Lakhpati Kisan Initiative. Livestock-related activities contribute to food requirements and draught animal power and maintain ecological balance. This sector contributes 4.11% of the total GDP. Considering the contribution of the livestock sector at the national and household levels, it needs to focus more on improving basic facilities to increase productivity. When we are talking about the livestock scenario in the central Indian belt, this becomes more critical because agriculture is rainfed, and livestock is an essential income source during difficult times. Seeing the opportunity, CInI has been working on the livestock prototype, and the number of households covered is the second largest after agriculture. Under LKP, animal husbandry significantly increased the additional income of marginal farmers in the four states. This chapter discusses the major strategies focusing on livestock taken in the programme. In the initial stages, the major struggle was to reduce mortality, as that was the core of increasing the herd size and ensuring additional livestock income. The focus was on improved health management practices to reduce mortality and increase goat/pig/cattle herd size at the household level to ensure additional income for marginal farmers. Continuous awareness generation helped the community adopt new technologies. Promoting livestock entrepreneurs and service persons helped to strengthen the local service delivery mechanism. They provided health care services (preventive and curative), breed improvement, quality feed, etc. Seeing the acceptance at the community level, small credits were planned to maintain the herd size, which was accepted by the community. Besides, under cattle rearing, fodder promotion and biogas slurry provided huge nutrient potentials for the vegetative and reproductive growth of field crops with long-term sustainability.

Chapter 6 focuses on women's empowerment and equity issues that women-led community institutions initiated to build social resilience. Tribal society is more sensitive to gender issues compared with caste societies. The fragile and patriarchal situation within the village ecosystems must be managed with a high level of sensitivity regarding gender equity. With a focus on agriculture and allied livelihoods to make small and marginal families *lakh patis*, the key principle was communication through women-led community institutions. As women play a key role in most livelihood activities at home and always consider the family the first focus, LKP made this the most important principle. With the focus on agriculture-based livelihoods and women playing the most critical role in working on agriculture and allied livelihoods, the focus was on engaging with women to build their

capacities and empower them. This was done considering that all members of the village ecosystem needed to improve their livelihoods. Community leaders tried to take up focused interventions for the families struggling to enhance their livelihoods. Engagement with different stakeholders was managed by the community, primarily women.

The last and concluding chapter, Chapter 7, focuses on institutions and entrepreneurship issues. Through LKP, CInI attempted to address the critical aspects of prosperity with market-driven, demand-led sustainable business pathways, which could be considered an approach in the sector with proper donor investments. On this journey, CInI worked towards establishing a framework to ensure the irreversibility of the impact under the LKP, which is led by community-based institutions and promotes the Micro-Enterprise in Box (MIB). Various levels of community-based institutions, from women-led Self-Help Groups (SHGs) and Producer Organisations (Food Processing Organisations or FPOs) to federations, were promoted to meet the aspirations of the communities and templatise and upscale the interventions. While implementing LKP, focusing on agri and allied livelihoods, various gaps were identified in the existing value chains at the pre-production, production, and post-production stages. These were common across all livelihood themes like agriculture, animal husbandry, and non-timber forest produce. Rural micro-entrepreneurship was promoted to plug these identified gap areas and further enable service delivery at the doorstep to enable households to increase their incomes. The entrepreneurs from the villages, identified through a robust process by the women leaders, were empowered to demystify and customise the available technologies per the local demand for the success of their businesses. These entrepreneurs were incubated through community-based institutions, utilising the concept of MIB. CInI developed templates for the MIBs based on the existing entrepreneurs' and domain experts' experiences and real-time feedback. Each MIB template comprised a set of basic guidelines for entrepreneur selection, prototype description, SoPs, and financial guidelines. These were CInI tools for developing and replicating entrepreneurs in each theme across various production clusters to scale the programme.

1.4 Areas of Future Research and Policy Actions

As part of LKP, the learning continued regarding the families adopting the approach of integrating with technologies, market linkages, etc. The programme built a regular learning environment with key research questions as part of the expansion. With the expansion, the emphasis deepened on existing actions and broadened in new areas with the core principles. The broad areas of research were the empowerment behaviour of women at the family and community levels, the adoption of technologies from smallholders'

perspectives, market dynamics, and behaviour at the FPOs. Additional areas were the equity of outcomes at the community level, nutritional linkages with crop and allied livelihood diversification, expenses at the household level with the increase in annual income, climate resilience adoption at the community level, etc. The following issues could be considered for further research.

1.4.1 Technological Advancement in Agriculture

In recent years, India has seen significant advancements in technology used in agriculture aimed at increasing productivity and efficiency. Some of the significant technology trends include the following, on which future research could be based:

- Precision agriculture: using data and technology to optimise crop management practices, including soil analysis, weather monitoring, and remote sensing.
- Digitalisation: adopting digital tools such as mobile apps, cloud computing, and artificial intelligence to streamline agricultural operations and make better-informed decisions.
- Drones: unmanned aerial vehicles (UAVs) used for crop mapping, disease and pest detection, and irrigation management.
- IoT-enabled farming: the use of Internet of Things (IoT) devices in agriculture to monitor soil moisture, temperature, and other environmental factors in real-time.
- Genetic engineering: the use of genetic engineering to develop crops with improved traits, such as drought resistance and higher yields.

Overall, these advancements aim to make agriculture more sustainable and profitable while improving food security and reducing the negative impact on the environment.

1.4.2 Market Linkages, Digitisation, and Use of Remote Sensing Data in Agriculture

In recent years, India has seen increased market linkages, digitisation, and remote sensing data in agriculture to improve efficiency and profitability. Using digital platforms to connect farmers with buyers reduces the role of intermediaries and improves farmers' profitability. Digital tools such as mobile apps and cloud computing are used to improve supply chain management, financial management, and farm planning. Satellite and aerial imagery gather data on crop growth, soil moisture, and other environmental factors for crop management and irrigation decisions. These advances have

helped to improve the transparency and efficiency of the agricultural sector in India, allowing farmers to access new markets and receive better prices for their crops. Additionally, remote sensing data may improve crop assessment accuracy and speed, reducing crop failure risk and increasing farming operations' profitability.

1.4.3 Women's Empowerment and Leadership Development in Agriculture

Women's empowerment and leadership development have become increasingly crucial in Indian agriculture in recent years. Some of the key initiatives aimed at promoting women's empowerment and leadership in the sector include:

- **Women-led Farmer Producer Organisations (FPOs)**: the creation of FPOs led by women farmers provides women with a platform to share knowledge, pool resources, and access markets.
- **Training and capacity building**: providing training and capacity-building programmes to improve women farmers' technical and managerial skills, enabling them to take on leadership roles and make better-informed decisions about their operations.
- **Financial inclusion**: the creation of financial services and products tailored specifically to women farmers, including microfinance and insurance, aimed at increasing their access to credit and reducing their vulnerability to financial risk.
- **Property rights**: promoting property rights for women farmers, including recognising women's ownership rights over land and other assets, is essential for their empowerment and economic independence.
- **Gender-sensitive policies**: the development of gender-sensitive policies and programmes addressing the specific needs and challenges women farmers face, such as access to land, water, and inputs.

These initiatives have helped increase women's visibility and participation in agriculture and have allowed them to take on leadership roles and contribute to the sector's growth and development.

1.4.4 Institutional Change in Indian Agriculture

Institutional change has been a critical driver of growth and development in Indian agriculture; cooperatives, farmers' collectives, and easy access to credit have been critical components of this change. The creation of agricultural cooperatives aims at providing farmers access to collective resources and services, including marketing, credit, and technical assistance. These collectives can improve farmers' bargaining power and help increase their

profitability. The creation of financial services and products improves farmers' access to credit, including microfinance and loan products tailored to the agricultural sector's needs. These initiatives have helped to improve the efficiency and competitiveness of Indian agriculture, enabling farmers to access new markets, reduce their costs, and increase their profitability.

1.4.5 Climate Adaptation and Livelihood Diversification for Sustainable Agriculture

Climate adaptation and livelihood diversification have become essential priorities in Indian agriculture in response to climate change and variability impacts. Some of the key initiatives aimed at promoting these goals include:

- **Climate-resilient crops**: promoting climate-resilient crops, including drought-resistant varieties, to reduce the risks of changing weather patterns and improve food security.
- **Water management**: the adoption of improved water management practices, including rainwater harvesting and irrigation systems, aims to increase water efficiency and reduce risks associated with drought.
- **Soil conservation**: promoting soil conservation practices, including agroforestry and terracing, to reduce soil erosion and improve soil health.
- **Livelihood diversification**: the promotion of livelihood diversification, including the development of non-farm income streams, reduces the risks associated with dependence on a single crop or market and improves the resilience of rural communities.
- **Climate-smart agriculture**: the adoption of climate-smart agriculture practices, including integrated crop management and conservation agriculture, reduces greenhouse gas emissions and increases the sustainability of agricultural operations.

These initiatives have helped to improve the resilience of Indian agriculture to the impacts of climate change and variability, enabling farmers to adapt better to changing weather patterns and improve their livelihoods.

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2

THE PROGRAMME DESIGN OF THE LAKHPATI KISAN INITIATIVE

Sujit G Kumar, Anjal Prakash, Arth Mishra and Stuti Srivastava

2.1 Introduction

India is one of the fastest-growing developing economies, with a current GDP of Rs. 234.71 lakh crore (~USD 2.84 trillion) for 2021–2022 (NSO, 2023). However, India's growth story is inconsistent with reality, as indicated by its HDI ranking, which stands at 131 (UNDP, 2020). There is a huge disparity in terms of income distribution across sectors. The agriculture sector, which employs around 40% of the workforce, contributes only 3.4% of GDP growth. And in rural areas, this disparity is more evident, with 64% of the workforce engaged in farming contributing only 31% of the net domestic product.

During the Fourth Five-Year Plan, there was a major focus on making India self-sufficient. The Green Revolution introduced high-yielding seeds that brought about a major transformation in food production. However, the benefits were concentrated in a few states with assured irrigation. Most of the area of India, on the other hand, relies on rainfed farming (68% of the total net sown area) with small and marginal landholdings of less than 2 hectares that have to cope with rising costs of inputs, deteriorating land quality, uncertain rainfall, etc.

Paradoxically, the areas richest in natural resources are the poorest and the most underdeveloped districts. Of the 50 top mineral-producing districts, 34 fall under the 150 most backwards districts. These districts, almost contiguous, form a tribal belt through the central Indian heartland. This central Indian plateau houses 72.25% of India's tribal population (Ministry of Tribal Affairs, 2020). Development in this region is recognised as central to ushering in inclusive growth in the country and calls for focused attention

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from all stakeholders for visible change. Table 2.1 shows the socio-economic status of tribals in central India compared to the rest of India.

As the table shows, central India lags behind on key development parameters compared to the rest of India. The report on causative factors behind the continued backwardness of certain states by the Commission of Centre-State Relations (2010) has been acknowledged in the 12th Five Year Plan, which draws a correlation among tribal communities, rainfed areas, and the incidence of poverty. The need for a paradigm shift from food security to farmers' income security is thus the basis for change.

With this vision, the Government of India has proposed doubling farmers' income by 2022 from agriculture and allied activities. Furthermore, 117 aspirational districts have been identified under the initiative based on poor socio-economic indicators and aim at health and nutrition, education, agriculture and water resources, financial inclusion and skill development, and basic infrastructure as core areas of the programme.

Against this backdrop, TATA trusts and its associate organisation, Collectives for Integrated Livelihood Initiatives (CInI), started conceptualising a programme – "Lakhpati Kisan" – to cover 16% of aspirational districts in the central tribal belt. In 2015, CInI launched the "Mission 2020 – Lakhpati Kisan: Smart Villages" programme to make 101,000 rural households (mostly among tribal communities) "Lakhpatis" irreversibly and sustainably through a high-impact programme to trigger large-scale development and a positive transformation of the region.

TABLE 2.1 Socio-Economic Status in Central India in Comparison to the Rest of India

State	*Percentage of Population below Poverty Line (2011–2012)**	*Literacy Rate (2011–2012)#*	*Infant Mortality Rate (Per Thousand) (2018)**	*Life Expectancy at Birth (2013–2017)*
Rajasthan	14.71	66.11	37	68.5
Gujarat	16.63	78.03	28	69.7
Madhya Pradesh	31.65	69.32	48	66
Chhattisgarh	39.93	70.28	41	65.2
Maharashtra	17.35	82.34	19	72.5
Odisha	32.59	72.87	40	68.4
Jharkhand	36.96	66.41	30	68.6
West Bengal	19.98	76.26	22	71.2
India	21.92	74.04	32	69

Source: Updated from Ballabh and Batra (2015).

Notes: *RBI 'Handbook of Statistics on Indian Economy'

#Census India (2011–2012)

In this chapter, the authors have tried to capture the various aspects of the initiative, from its birth to its meticulous design and major outcomes over the years. The chapter also discusses various characteristic features of Lakhpati Kisan, which has provided a unique value proposition. Furthermore, the chapter briefly highlights the associated concerns of the environment and concludes by suggesting a possible way forward.

2.2 Genesis and Overview of Lakhpati Kisan

Since the early 2000s, Tata Trusts has been focusing on the central Indian tribal belt through focused grants to organisations and research programmes building on the triggers for tribal livelihood enhancement. It has been involved in the central Indian tribal belt region through two programmes. Firstly, as a follow-through of a research study with the Indian Water Management Institute (IWMI), the Sir Ratan Tata Trust initiated the Central India Initiative with a budget of Rs. 72 crores through 27 partners who ran 43 projects. The Central Indian Initiative is led by CInI, which was established in May 2007 as an associate organisation of Tata Trusts. Through various field partners, it has reached around 200,000 households with interventions on the core thematic areas of natural resource management, including agriculture, food security, land and water resource development, strengthening forest-based livelihoods, organising communities, and enabling micro-level finance. Secondly, the Sir Dorabji Tata Trust took a thematic approach and financial interventions in systems of rice intensification and diversion-based irrigation, with about 60 partners, investing Rs. 137.7 crores over the same period.

From 2009 to 2014, these two programmes had significant outcomes and impacts on the lives and livelihoods of the project households. Some of these were:

- A 200% to 400% increase in food crop productivity, bringing the productivity of tribal areas to national standards.
- Investment in education by households tripled.
- 1 in 5 households (43,000) earned more than Rs 80,000 annually (from the average baseline income of Rs. 19,000 per annum in 2007–2008).

These figures indicated a better-than-expected improvement in the performance and impact indicators against what was planned in the impact monitoring framework developed by the Trusts in 2010. For example, while analysing various baseline and impact studies, households' income in 2012–2013 was Rs. 53,000. This was higher than the planned target, which aimed to bring households to an income level of Rs. 27,000 annually in 2012–2013.

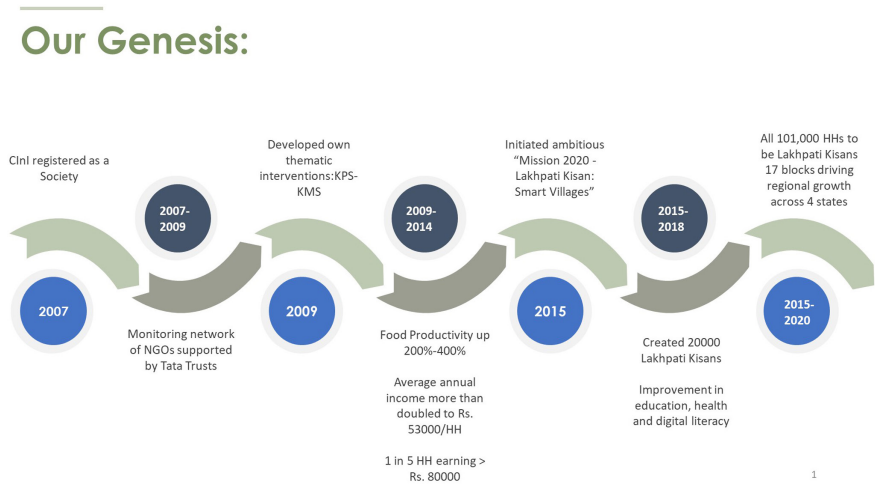

FIGURE 2.1 Roadmap to Lakhpati Kisan Initiative.

Source: Collectives for Integrated Initiatives, 2015.

This hands-on experience enhanced the perspective of Tata Trusts and its partner organisations. It provided a fertile ground to utilise the learnings of these programmes in a more focused manner. This gave birth to the ideation and launch of the Lakhpati Kisan Initiative for 2015–2020. Figure 2.1 depicts the chronology involved in seeding the Lakhpati Kisan Programme.

2.2.1 Overview of the Lakhpati Kisan Programme

Mission 2020: Lakhpati Kisan Programme (LKP) engages rural (majorly tribal) households in Gujarat, Maharashtra, Odisha, and Jharkhand as its focus groups. The goal of Mission 2020 was to improve the quality of life of rural and tribal households (and communities) in the 17 identified production clusters (blocks) across these 4 states (Figure 2.2), for which the programme has set quantifiable targets to achieve by 2020–2021. Firstly, it strived to bring at least 101,000 households irreversibly out of poverty, and secondly, it targeted an increase in their income to Rs. 120,000 and more per annum within five years.

LKP is a community-driven development initiative that tries to incorporate the community's specific needs based on geographic location, economic environment, social norms, and preferences. It is supported by the Tata Trusts, which developed the idea and provided financial support and technical guidance, and CInI, which is responsible for devising and coordinating its implementation. In a few of the clusters, CInI directly implemented the programme interventions, while in other clusters, existing partnerships with

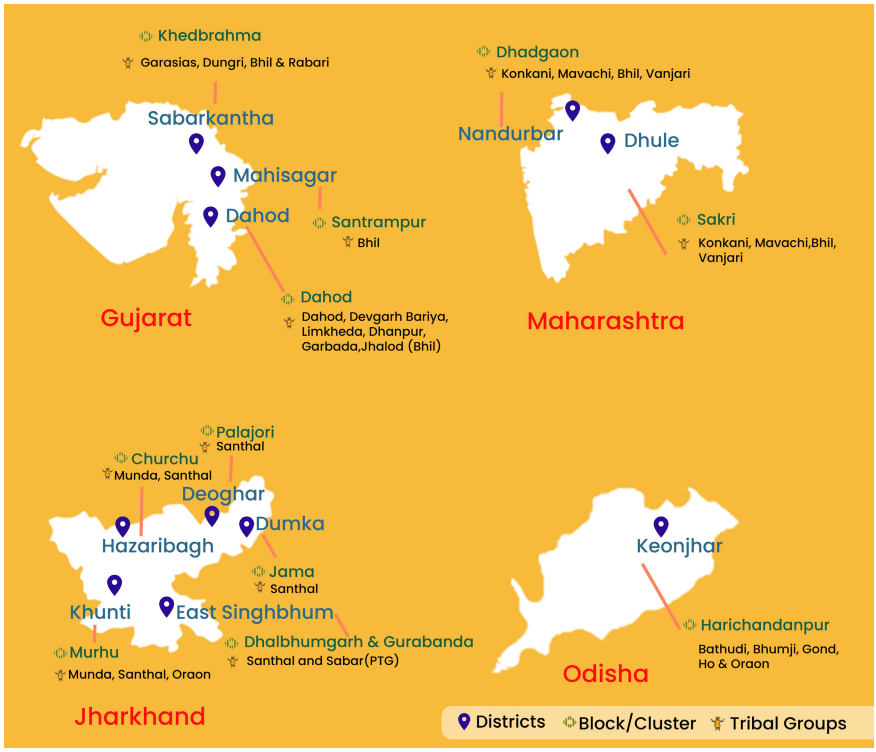

FIGURE 2.2 Map of CInI's Identified Clusters.

Source: CInI MIS Database.

different CSOs were leveraged and onboarded as Implementing Support Agencies (ISA). The key stakeholders engaged were the community-based groups, which included women-led SHGs, village organisations, farmer-producer organisations, and their federations. They led the work by helping design interventions, supporting families in executing them, and garnering support from block officers and other government officials. It was envisaged that these community institutions would ultimately carry the work ahead and expand their regional outreach.

- Moreover, by design, the initiative works closely with women-led SHGs, which are the primary institutional interface at the village level. "Lead Didis" (female leaders) who understand Lakhpati Kisan's interventions were trained and motivated to work as influencers, where they helped to mobilise the households and be the catalysts to engage with other women members and help them adopt proven farming strategies and technologies. They take ownership of the programme through mobilisation,

discussions, external facilitation, and knowledge sharing. Successful results also encourage others to join, as developing new habits or taking new actions spreads more quickly when people see a neighbour adopting or sharing a new behaviour.

From its inception in 2015 to 2021, Lakhpati Kisan has reached around 104,545 households across 958 villages and transformed nearly 48,000 into Lakhpati Kisans with an average annual income increase to at least INR 105,000, against a baseline of INR 38,000 in the year 2015 (3rd Party Impact Assessment by Deloitte, 2021). Along the journey, CInI has worked with 7,680 SHGs across 448 village organisations and 25 apex institutions (FPOs/FPCs/federation). As evident, LKP has seen very encouraging results, and the success stories and learnings from the five years testify to the unwavering commitment of every participating stakeholder and the programme's durability.

2.3 Why Was the Initiative Needed?

In the project areas, 51.57% of the tribal population lives below the poverty line compared to 30.2% of the general rural population. Before 2015, around 66% of people lived below the poverty line in 900 tribal blocks with small and fragmented landholdings of less than 2 hectares. A lack of livelihood options, limited facilities, and changing climatic conditions altogether made agriculture a risky venture in the area.

As many as 39% of the households in these clusters grew only a single crop a year, and only 14% of farmers had access to irrigation. The undulating terrain and lack of irrigation facilities made farmers risk-averse, and they preferred to grow the least risky crops like paddy, maize, and pulse. As many as 89.5% of households had landholdings of less than 2 hectares. Due to small and fragmented landholdings, lack of good agricultural practices, and only 1% adopting improved production technologies, the average productivity of these predominantly rainfed farmed areas was far lower than the state averages, with high chances of crop failure due to the vagaries of nature. Furthermore, there were no approaches to mitigate risks. Food security, scientific knowledge, a support system to leverage livelihood potential, and entrepreneurship avenues were lacking. There was low awareness of scaling up climate-resilient agriculture. All these factors reduced agriculture to a subsistence level and led to poverty and distress migration.

LKP aimed to unlock agricultural potential in these regions by implementing key livelihood, institutional development, and quality of life interventions. Table 2.2 summarises the challenges and solutions designed under the programme to address key issues associated with risks in the agricultural system in these areas.

TABLE 2.2 Summary of Key Challenges and Proposed Interventions

Challenges (Base Year 2015–2016)	*Impact on Livelihood/Reason for Change*	*Solution*
Rainfed farming and mono-cropping	• Dependence on rainfall and lack of irrigation enlarged the risk associated with crop cultivation. • Failure of crops ultimately led to losses as there was no way to mitigate risks. • Undulating terrains or suboptimal utilisation of uplands hindered income realisation.	Irrigation and Watershed Development programmes serve as enablers to enhance productivity in agricultural output. Layering prototypes in livestock and NTFP can mitigate the risk of crop failure. Optimal usage of water structures through intensive high-value agriculture.
Limited credit facilities and information gap	• Quality of land was not suitable for hybrid seeds. • The high interest rate on credit and loans. • Asymmetry in information regarding government schemes.	Composite variety seeds as a coping mechanism for year-round agriculture. Facilitation of institutional credit linkages and convergence with government schemes and entitlements.
Limited livelihood options	• Subsistence farming practices with no other employment opportunities.	Identify a "cadre of champions" to develop rural entrepreneurship skills. Entrepreneurship prototypes in the poly-house nursery, livestock, water, and brood lac to diversify livelihood options.
Lack of market linkages	• Products were not competitive in the market due to limited quality and logistics facility. • Difficulty in accessing nearby city markets due to distance. • High transportation costs. • Farmers did not receive fair prices while middlemen made a big cut.	Collective marketing to ensure fair prices for produce through digital payment. Infrastructure development for storage and warehouse system. Developing market linkage through FPOs.

(*Continued*)

TABLE 2.2 Continued

Challenges (Base Year 2015–2016)	*Impact on Livelihood/Reason for Change*	*Solution*
Lack of awareness of good farming practices and leverage system	• The high mortality rate of livestock. • Lack of vaccination centres. • Only 1% of the farmers adopted technical innovations.	Establishment of Dairy Animal Information System (DAISy). Capacity building of all stakeholders to create demand and integrate interventions in the thematic area. Strengthening agriculture knowledge extension systems, including the use of digital platforms to disseminate crop advisory and market linkage services.
Poor quality of life	• Open defecation, unsafe water, and lack of sanitation made families vulnerable to infectious diseases. • Food insecurity and malnutrition. • Low literacy and education.	Construction of water storage tank for the community and monitoring through quality testing kits. Awareness of education and hygiene.

Source: Author's compilation.

LKP envisaged a large-scale transformational change in the lives of the communities through a community-driven approach. This galvanised the communities, built their collective aspirations for a better life, showcased possible ways to realise these aspirations, and drove a cascading effort for similar development across the region, bringing about large-scale alleviation of poverty and far-reaching improvement in quality of life. The programme design integrated sustainability and scale as key components of the overall approach from inception.

2.4 Deconstructing the Lakhpati Kisan Programme

2.4.1 Baseline Status

Becoming a "Lakhpati Kisan" provides an impetus to transform the lives of tribal households and ensures that they follow their aspirations for a better future. Experiences from the Central India Initiative (2007–2014) show that the increase in income of a project tribal household had several direct

impacts: improved nutritional intake by the family, improved access to drinking water and sanitation, better health, increased investment in the education of their children, and the availability of better life choices (such as habitation, cooking fuel, and mobility vehicles). Acknowledging the learnings from the Central India Initiative, before the launch of Mission 2020 – Lakhpati Kisan: Smart Villages, CInI conducted a household survey of the targeted production clusters through implementing support agencies (ISA). This covered the baseline status of the income, farming practices, and other profile factors. This formed the basis for the development of the individual cluster-level Project Implementation Plans (PIP). The learnings from the PIP helped in designing the programme differently across clusters to meet the specificity of communities based on existing norms, behaviour, and preferences of the demography. Some of the key findings common across all the clusters were:

- About 80% of the rural households belong to the tribal community segment with an average income of Rs. 40,000 p.a. from agriculture and allied activities.
- About 89.5% of the farm households were small and marginal farmers with an average landholding of less than 2 hectares.
- About 66% of the small and marginal tribal households lived below the poverty line.
- Only about 14% of the households had access to irrigation, while only 1% were familiar with the technology.

The underlying inference indicated that small and marginal households could not enhance their earnings from agricultural produce alone due to the reasons stated in Table 2.2. While designing the programme, discussions with the community, especially SHGs and women leaders across clusters, indicated that an income of at least Rs. 10,000 per month was needed to sustain themselves and break out of poverty irreversibly. Thus, an annual income of Rs. 1.2 lakhs was the desired income to take care of some of the aspirations of the small and marginal tribal households and thereby make them "Lakhpati."

2.4.2 Methodology of the Lakhpati Kisan Programme

2.4.2.1 Operational Strategies of Lakhpati Kisan Program

2.4.2.1.1 Triggering Community Demand

With sustainability and self-reliance in mind, the programme tried to actively fuel demand while building on community-to-community communication processes. The goal of prosperity for all can be realised only when community aspiration and demand drive upscaling. This vision must also be held

across the implementation channel. The shift from food security to prosperity is transformational and requires a number of elements in the operational strategy to work together:

- Experience in tribal areas shows that the creation of an asset does not always assure its usage. Household knowledge doesn't imply translation into practice. This relationship is mediated by numerous factors, including household motivation and resources. Decades of marginalisation have brought a sense of acceptance of the present, while the current resource base also restricts risk-taking ability. It is here that a change in attitude was needed in the area. An environment that also enthuses and encourages individuals to move towards the aspiration of prosperity is required. Therefore, a well-designed communication strategy that leverages existing processes at the community level was used.
- Results always speak louder than words. Having seen successful interventions in their own context encourages individuals to take up similar actions. A strong demonstration of results with widespread sharing/dissemination among the community was therefore key. This includes sharing such demonstrations in other locations with similar contexts. Community-level celebrations/events were also an important way of articulating achievements and generating additional interest in the same.
- This goal-setting exercise is done iteratively with the community members, which helps all players in the implementation channel to hold a common vision – a dream – of prosperity in the community. This implies planning with the community at the outset but also revisiting our goals periodically at multiple levels.
- While all in the channel need to hold the vision, there is a cadre of champions who are more driven than the others. These change agents nurture the dream and motivate the community periodically. This community-level cadre, known as the Community Resource Persons (CRPs)/Local Resource Persons (LRPs), needed to be identified and invested in systematically. Community institutions were at the centre of the approach. These human resources are expected to continue in the area after the initial five to six years of intensive work by the initiative partners. There are many examples of communities leading change through their institutions' setups. This means not only taking the lead in adding new dimensions to the development of their members, but also, in turn, extending their support to other communities/areas. Among others, the implementation design proactively included: (a) leaders playing a critical role in agriculture extension by motivating other members, (b) older self-help groups promoting new groups, and (c) the creation of capital, including member equity, in all institutions commensurate with their functions

While demand is fuelled, it is also important to ensure that there is demystification and decentralisation of the following services/linkages so that households/communities can access these without depending on mediation by the implementation channel:

- Access to inputs and output linkages with the market.
- Access to credit enables households to move forward on their own path of prosperity without dependence on subsidies/grant investment, which may be limited.
- Access to updated knowledge.

2.4.2.1.2 Nurturing Sustainable/Self-Managed Community Institutions

The programme by design had a focus on nurturing community institutions – primarily federations of women's self-help groups – from the very inception stage. The institutional landscape of federations and clusters was envisioned in parallel with the planning of the programmatic interventions.

The role of the community institutions in creating demand in the area was also articulated. These community institutions are expected to be sustainable, and their institutional roadmap was developed. The role and interface between the implementing/facilitation mechanism and the community institutions were to be clarified and constantly reviewed to help identify and address any grey or conflict areas.

The programme broadly tried to follow the community institution structure under the National Rural Livelihoods Mission. Women's self-help groups would play the role of mutual support, credit linkages, and forums for extension/knowledge inputs. Twelve to fifteen groups would form clusters, which would serve the role of conflict resolution, cross-learning, and providing services to the groups. Village organisations would be promoted from groups from the same village, which would help in taking up activities for village development. The SHG federations would be promoted, taking about 200–300 groups. However, this would be contextualised as per location requirements. While some were registered under the cooperative societies, many of the apex institutions were also registered under the Farmer Producer Companies Act.

Further economic collectives such as farmer producer organisations, water user groups, lift irrigation cooperatives, and their federations were formed, and/or existing institutions were engaged with, and also emerged as a key institutional interface for long-term market linkages. All elements of our action were aimed at groups of women farmers (SHGs and higher-level apex institutions), not individuals. This was based on our understanding and experience that, as collectives, our target communities are more likely to have an enhanced role and share in agriculture value chain development.

2.4.2.1.3 Multiple Interventions at the Household Level

All participating households were facilitated to reach the identified goals. This implies engagement in institutions, agriculture, and water resources with all participating households who have land resources. Interventions at the household level included those that augment income and those that reduce leakages in the household or village economy. All interventions were attempted at a minimum scale of outreach. The unit size of interventions was defined keeping in mind its contribution to household goals. Emphasis was placed on innovation, ensuring that work is not done not from a stereotyped point of view but brings recent developments into our project areas.

A matrix of activities at the household level was also defined keeping in mind the resource base/factor conditions required for the intervention, and a broad categorisation of households was done as per their resource base. The planning exercise in each location would map households onto the intervention matrix to give the specific number of households likely to participate in each intervention. Given that the resources available to these households are limited (very small landholdings and limited assets), our focus was on the diversification of livelihood activities (livestock, agri and agri plus), strengthening their access to resources, and making agriculture more efficient through the adoption of best practices.

Another crucial aspect of our intervention was to address water scarcity by working on a slew of water conservation and enhancement measures, thereby promoting greater sustainability in agricultural practices. Similarly, in promoting climate-resilient agriculture and the diversification of livelihood activities, we are making the community even more resilient. Also, in promoting a pay-for-service model through the agri-entrepreneurship idea, we are pushing for the use of local resources, thereby minimising the effect of any external shocks in the future (Figure 2.3).

Cost and financing: LKP has a unique funding model that draws on a broad support base from stakeholders, including the community. The initiative design required an investment of INR 60,000 per household, aimed at taking it to the lakhpati level within five years. Tata Trusts provided 15–20% of these funds; another 15–20% came from rural households through in-kind or cash contributions; and the remaining 60–70% was drawn from various funders, including the government. The funding organisations supporting LKP included departments of state governments, the National Bank for Agriculture and Rural Development, Infosys Foundation, Ernst and Young Foundation, Tata Communications CSR, Ford Foundation, Tata Steel CSR, and Bharat Rural Livelihoods Foundation, among others (Venkatachalam et al., 2018). This model was unique as it helped households view agriculture and allied activities from a business lens and move away from subsidies to meet their aspirations, building economic security.

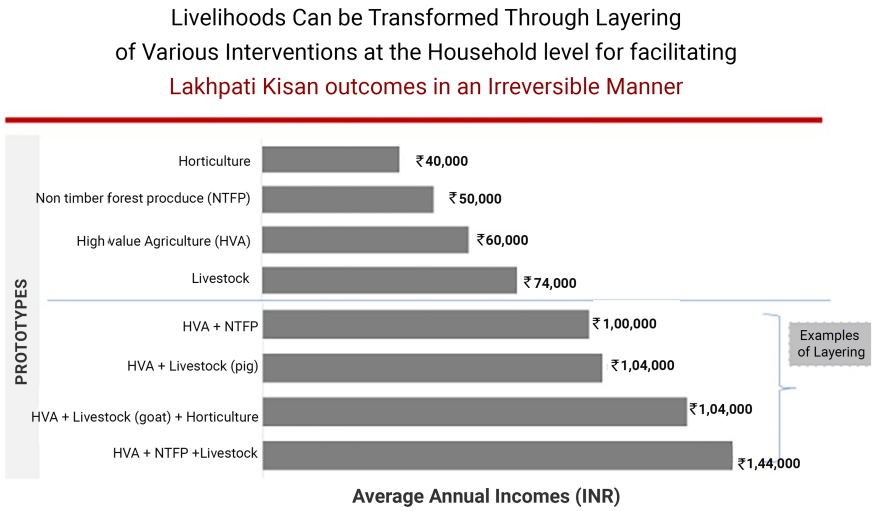

FIGURE 2.3 Income Enhancement from Layering Prototypes.

Source: CInI MIS Database.

2.4.3 Operation Design, Field Implementation Plan, Monitoring and Evaluation Framework

2.4.3.1 Operational design

The Phase-1 plan of LKP was made for the first five years (2015–2020), and the level-wise quantifiable targets were set to follow a definite path. This ensured that regular progress accrued over the years to achieve the main objective of lifting 100,000 households irreversibly out of poverty through community-led institutions across the four states. Further, a distributive plan (Table 2.3) was laid down at the block and village levels to reach the target households. This proved to be an effective and realistic approach to align every stakeholder with the mission.

2.4.3.2 Field Implementation Design

In its design, LKP aimed to demonstrate impact within five years. For this, a gradual path was adopted for households, and investments were made. Table 2.4 shows how broad year-wise goals were planned under different thematic interventions. Institution strengthening was a central strategy from the initiation of the programme, where the fifth year focused on the stabilisation of institutions, which was achieved by aligning CInI's proposed three-tier institutional design in areas (like Khedbrahma in Gujarat) where institutions already existed as a part of SRLMs or building them from scratch in areas (like Jharkhand) where institutions were absent.

TABLE 2.3 State-Wise Distributive Plan

State	*Block*	*Village*	*Households*
Jharkhand	6	435	28,000
Odisha	1	104	6,500
Gujarat	8	292	57000
Maharashtra	2	47	9,000
Total	**17**	**878**	**100,500**

Source: Collectives for Integrated Initiatives, 2015.

(a) **Area/block selection criteria:** Initially, the focus was on the blocks with more than 50% tribal population, comprising 300 of the 502 tribal blocks in these states. Also, the programme continued in some other blocks owing to previous interventions. After that, these areas/blocks were taken in a geographical cluster to the extent possible so that a ripple effect on the scaling of interventions could be orchestrated for communities and the state machinery.

(b) **Target community identification**: After identifying the area, a wealth ranking exercise was initiated, based on which households were characterised as per their well-being. The parameters for identifying the well-being as high, medium, and low were:

- Landholdings by the households
- HH composition (members, health, widow, elderly persons)
- Irrigation scope and facilities
- Entitlements
- Health
- Education
- Regular income (service/job) vis-à-vis wage dependence
- Assets (cycles/motorcycles/tractors/four wheelers)
- Alcoholism
- Livestock

(c) **Cluster and area approach**: A minimum of 2,500 households in the Eastern region and 6,000 households in the Western region were selected for the programme within a block constituting 20–50% of the population. Broadly, the first set of interventions was focused on community organisation and livelihood interventions. After that, education and drinking water sanitation interventions followed based on context analysis and prioritisation.

Further, the programme area selection strategically covered geographically contiguous or adjoining locations to facilitate active

TABLE 2.4 Year-Wise Goals Interventions

Interventions	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*
Agriculture productivity enhancement – rainfed conditions	30% of households should be covered	100% of small and marginal households should be covered	The productivity potential of field crops under rainfed conditions reached	Practices continued	Institutional stabilisation
Community organisation	70% of the households to be reached out to	30% of the households to be reached out to	Promotion of cluster level/APEC institutions(s)	All households brought under effective and functional institutions	
Irrigation and agricultural land development	Optimal utilisation of existing infrastructure; filling gaps; land and water resources development micro plan	Implementation of irrigation infrastructure development activities	Implementation of irrigation infrastructure development activities	Implementation of irrigation infrastructure development activities	
High-value agriculture	10–20% of households of the proposed plan will be covered under vegetables with the market	20% of households covered in the production cluster formed with 150 to 200 farmers in each of these clusters	Increase the numbers to 100% to cover the full potential	Continue the practices for stabilisation of the vegetable cultivation practices and market linkages	

Source: Collectives for Integrated Initiatives, 2015.

Following this, the impact was tracked across these categories to see how the programmes benefitted different community segments.

community-to-community learning and knowledge transfer. It also intended to build the significance of scale in a geographical area, which was needed to enable external conditions. In the first phase (2015–2020), quality-of-life interventions such as drinking water, sanitation, and education were taken up in limited areas. As prosperity and improved quality of life went hand in hand, such interventions were scaled up further in the next phases, which would layer other quality-of-life interventions on the livelihood/institution dyad.

2.4.3.3 Monitoring and Evaluation

LKP established a comprehensive monitoring and evaluation framework to improve the programme delivery's effectiveness. This was necessary to arrive at informed and data-driven decisions, considering the scale of interventions. Acknowledging this, the overall impact and concurrent progress in the intervention areas were measured against a set of monitoring indicators under three broad themes: livelihood, institutional, and quality of life (Figure 2.4).

These theme-wise monitoring systems were set up across all the cluster areas to track the outcomes of the direct interventions at the household level. In this regard, many technological tools like MIS and the CropIn App were deployed to capture the regular progress/output data in digital form. This was evaluated against the targets in the annual state-level plan and

FIGURE 2.4 Monitoring Indicators.

Source: Collectives for Integrated Initiatives, 2015.

associated rollout cluster plans. It helped the operational teams to reemphasise or reorient the goals.

CInI, the nodal agency, undertook concurrent monitoring to review progress and identify and resolve bottlenecks. These reviews provided the agenda for engagement with stakeholders, including the government. Theme-based reviews were conducted to review strategy effectiveness, and these, together with regional/partner-level steering committees, undertook mid-course corrections and ensured that emerging opportunities were built on. In parallel, community institutions and members utilised various community-based assessment tools (annual reflection and learning retreats). This developed in them a shared understanding of the present status to chart the way forward and enhanced the participatory nature of the M&E process (Figure 2.5).

Tata Trust conducted an annual financial audit, and an extensive third-party review system was included to facilitate transparency and accountability. Qualitative studies were undertaken periodically for learning products and dissemination to help refine the programme intervention matrix. Further, lessons generated from the programme were disseminated through an effective communication strategy, which also built visibility for the agenda and helped position the sectoral leadership of the initiative. Products included:

(a) Manuals and process documentation.
(b) Information, education, and communication material for field-level use.

FIGURE 2.5 Monitoring and Evaluation Process.

Source: Collectives for Integrated Initiatives, 2015.

(c) Dissemination events at multiple levels, including the field, district, state, and regional levels, for the exchange of ideas and cross-learning.

2.5 Distinguishing Factors: The Journey of Lakhpati Kisan

The journey of Lakhpati Kisan since 2015 has resulted in many learnings and has helped it shape itself to successfully reach its objective. Looking back and joining the dots, numerous underlying factors have contributed immensely to defining and characterising what LKP became. This section describes some of them.

- **Dynamic evolution**: LKP utilised feedback from ground experiences to course-correct over the years. Such a scope can be ascribed to the design of its implementation plan wherein flexibility in the allocation of resources as per the requirements at the cluster and household level was provided. This, in turn, enabled the CInI team to plan and include livestock development as a key livelihood prototype in Gujarat during the second year. Moreover, the programme team addressed gaps in the value chain realised over the years by incubating and promoting rural entrepreneurship from 2017 onwards.
- **A crucial aspect of development philanthropy**: The development sector has moved from making large charitable grants towards the sustainability of the desired outcomes. In theory, the "giver model" of development philanthropy has been replaced by the corporate model, where donors are interested in funding market-led self-sustaining projects. CInI addressed the conflicts between philanthropic longing for charity and market-driven demand-led sustainable business pathways in the development sector through LKP. While Tata Trusts made significant donations, the bulk of finances (about 60–70%) came collectively from other private partners, state governments, and institutions like NABARD. Also, investments by some institutional partners like BRLF were crucial, enabling CInI to reallocate a part of the budget from training to hardware investments. Moreover, support from corporate partners (like E&Y) helped CInI prioritise the allocation of resources. Since its inception, LKP has tried to inculcate a sense of ownership by including shareholder contributions in community-based institutions. This made the community itself a major funder of development philanthropy and eventually moved towards a self-reliant mode.
- **Impact and outcomes of the Lakhpati Initiative on the life of tribal households**: In the fourth year, an outcome survey was conducted by Tata Trusts with the help of TAS (Tata et al.) managers to understand the LKP and identify and capture the income and lifestyle outcomes. The survey was done in four blocks: one each in Gujarat and Odisha and

two in Jharkhand. A survey was created with inputs from community discussions to capture the outcomes subjectively. The survey covered household income, savings, market linkage, quality of education and expenses, cooking fuel, and housing. Figure 2.6 depicts the spillover impact of the increase in income on quality-of-life indicators. It was observed that the households were trying to provide better education

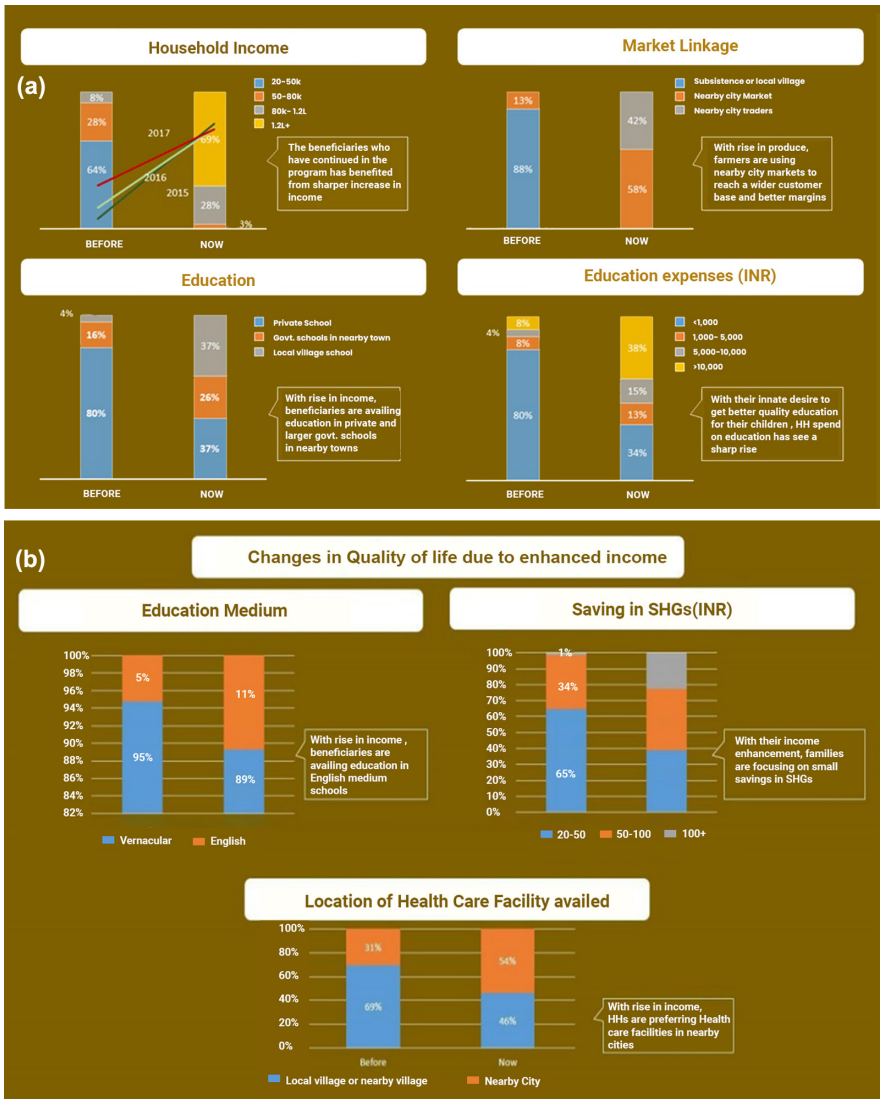

FIGURE 2.6 Multiplier Effect of Increase in Household Income.

Source: BRLF, 2020.

to children; they wanted to send their children to boarding or private schools and were willing to invest the increased income in education.

The growth of community institutions like SHGs, FPCs, FPOs, and federations enabled their shareholders to make savings and use them to send children to schools and to invest in quality products or assets for higher agricultural yields, for health emergencies, etc. Yet, the audit report acknowledged the need to encourage the communities to avail themselves of quality services and make them aware of the services they can receive from the government, like health care. This could potentially reduce the burden of expenditure for many households.

- **Convergence with the government's schemes**: The LKP interlinks with the government's vision of doubling farmers' income. The programme also has similarities with the National Rural Livelihood Mission (NRLM) with three-tier institutional structures. This has helped to mobilise funds and extend working capital to the SHGs, revolving funds to the village organisations, and working capital to the federations via SRLMs. Also, in some states, LKP has leveraged benefits from subsidies offered under state governments' "Supporting Drip Irrigation" programmes. Furthermore, the potential of solar irrigation was realised using the KUSUM scheme of the Central Government, wherein the government gives 60% of funds, and 40% comes from the community.

The team and community institutions have made considerable efforts towards linkages with key government programmes. In **Jharkhand**, the JOHAR programme was influenced by LKP and clusters were considered for initial scaling up. The institutions leveraged more than Rs. 1 crore from JOHAR funding. In **Maharashtra**, the government asked CInI to implement LKP in all 6 blocks of the Chandrapur district with around 50,000 households. All programme funding came from the government, while CInI covered technical support costs. Similarly, the Tribal Development Department in Nandurbar approved a grant of INR 13 crores. The CInI team is discussing with the Orissa Livelihood Mission (OLM) to take up LKP in nearly 25,000 households in 5 blocks of 4 districts. The programme funding will be leveraged from the government for these households.

There was a positive response from Niti Ayog on taking up LKP in the aspirational districts, and the discussions for collaboration are ongoing.

2.5.1 Lakhpat Kisan in alignment with Sustainable Development Goals

At its core, Lakhpati Kisan mirrored the philosophy behind the Sustainable Development Goals 2030 – Providing Local Solutions to Tackle Global

Problems. One of the long-term impacts that Mission 2020 envisaged was empowering the rural-tribal communities by creating a virtuous cycle of sustainable livelihoods, and the process was to be spearheaded by community-based institutions. CInI, along with its many partner organisations, was facilitating the same. This shows how SDG 17 (Partnership for the Goals) was realised in letter and spirit. Further, the Mission 2020 objective and interventions showed a high correlation with SDG 1 (No Poverty), SDG 2 (Zero Hunger), SDG 3 (Good et al.), SDG 4 (Quality Education), SDG 5 (Gender Equality), SDG 6 (Clean et al.), and SDG 8 (Decent Work and Economic Growth). These were captured in the impacts discussed in the previous point.

- **Managing practical concerns**: Bad cropping seasons and the lack of warehouse facilities, logistics, and market linkages were major concerns for distress-driven forced migration. Around 8,579 people from the households covered in 2015 migrated for work. This was also a coping mechanism, as fewer people in a family allowed them to stretch available food for longer. However, migration that isn't aspirational affects people's mental well-being. As many as 45.85% of people rated themselves as low in well-being in 2015, which was nearly half the population covered by the project. LKP's initiative managed to intervene at the household level to enhance income and improve the quality of livelihoods. The project tried to manage the concerns of the central tribal belt by dismantling the myths associated with rural India. Agriculture was not the sole means of rural livelihood. There existed a vast unexplored potential to unwrap. Creating a matrix of activities in the thematic area based on resource availability and demographic conditions helped to improve livelihoods. The introduction of layering prototypes and rural entrepreneurship focusing on diversifying livelihood activities strengthened access to resources. It made agriculture more efficient through the adoption of best practices.

Completing a five-year tenure with lessons and challenges brought forth many practical and policy concerns. The emergence of the COVID-19 pandemic and countrywide lockdown posed an unprecedented threat as the demand for fruits and vegetables dropped as traders restricted their operations. To meet the challenge of income reliability, CInI set up a direct retailing initiative. It had the potential of fetching a higher share in consumers' prices and perfectly illustrated how practical concerns and associated challenges could be resolved through partnership. The community-centric approach thus was an important piece in the puzzle that held answers for improving the income of smallholders with reliability. Learning from these experiences was implemented post-COVID.

2.6 Dilemma of Immediate Gain vs Sustainable Development

A concern arose around promoting economic development at the cost of the environment. The topography of the areas was rainfed and thus required infrastructural projects like watershed development to promote irrigation. The rise of privately owned sources of irrigation from 31.05% in 2015 to 43.3% in 2020 raised the question of whether the immediate gain of farmers to enhance income at the cost of sustainable development was acceptable. Shah et al. (2021) explained why the Green Revolution, a wheat-rice revolution, could not flourish in the central tribal belts as it required intensive irrigation. Climate-resilient farming and a shift to the efficient utilisation of water was the only way to meet people's drinking water and livelihood requirements, which would be difficult to achieve if the focus was on rice and wheat. The interrelation of vulnerability, adaptation, and resilience to transform rural livelihoods was a key takeaway of the programme. Incomes from agriculture alone made farmers vulnerable to other threats. Through layering prototypes, LKP diversified livelihoods, making farmers more climate resilient. In promoting the pay-for-service model through the agri-entrepreneurship idea, the push was for using local resources, minimising the effect of any external future shocks. Training by the thematic coordinator on the rigour of interventions, capacity building, and knowledge sharing helped stakeholders collaborate.

2.7 Way Forward

LKP aimed at bringing tribal households irreversibly out of poverty. Lessons, ground experiences, and course corrections of the programme gave the flexibility to address households. Market linkages and institutional stabilisation for accessing fair produce prices were designed through collective marketing. This reduced the transportation cost and increased traders' interest in the clusters. LKP collaborated with partner organisations and incorporated good practices. Improvements in market linkages could be addressed through the model adopted by Karnataka with NCDEX, which allowed for e-trading, computerised billing, and end-to-end processes. This enabled the implementation of the Unified Agriculture Marketing Scheme, which envisaged a common e-market platform that would be deployed in selected regulated wholesale markets (Raju et al., 2016).

However, the programme does not work in silos. Continuous interventions in education and human capital, health and nutrition, and habitation improvement through access to safe drinking water and sanitation are required. These interventions need to be sequenced to be implemented without diluting the quality of any single vertical. Experience has also shown

that intensive involvement is required in the region to create an impact. Interventions in education in the Khunti district were a lesson used to develop a scale-up plan. In Phase 2 (2020–2025), emphasis will be laid on a multi-sectoral approach. It will also pilot interventions in drinking water and sanitation on a scale with intensity. To cover all the households of the programme, an attempt will be made to develop a programme package led by the community, that does not require heavy bandwidth for delivery by the implementing system and effectively addresses the main issues. The table 2.5 shares the details of the states, districts and blocks where the Lakhpati Kisan programme is being implemented.

Annexure

ANNEXE TABLE 2.5 Project Location of CInI

State	*Aspirational Districts Identified by the Government of India*	*CInI's Geography*	*Blocks*
Jharkhand	Bokaro, Chatra, Dumka, East Singhbhum, Garhwa, Giridih, Godda, Gumla, Hazaribagh, Latehar, Lohardaga, Pakur, Palamu, Ranchi, Sahibganj, Simdega, West Singhbhum, Khunti, Ramgarh	Deoghar, Dumka, Dhanbad, Hazaribag, Khunti, East Singhbhum	Churchu, Dhalbhumgarh, Gurabandha, Jama, Murhu, Palojori, Tundi
Odisha	Balangir, Dhenkanal, Gajapati, Kalahandi, Kandhamal, Koraput, Malkangiri, Nabarangapur, Rayagada, Nuapara	Jajpur, Kendujhar	Danagadi, Ghasipura, Harichandanpur
Gujarat	Dahod, Narmada	Dahod, Banaskantha, Mahisagar, Panchamahal, Sabarkantha	Data, Dahod, Devgarh Baria, Dhanpur, Garbada, Halol, Jhalod, Khedbrahma, Limkheda, Poshina, Santrampur, Morva Hadaf
Maharashtra	Gadchiroli, Jalgaon, Nandurbar, Osmanabad, Nanded, Washim	Chandrapur, Dhule, Nandurbhar	Akkalkuwa, Akrani, Ballarour, Dhadgaon, Mul, Pombhurna, Sakri

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3

AGRICULTURE-BASED LIVELIHOOD ENHANCEMENT THROUGH PRODUCTION CLUSTER APPROACH

Experiences from Lakhpati Kisan Initiative

Santanu Dutta, Sudipta Das, Vivek Singh, Shaivya Singh and Sonal Jain

3.1 Introduction

In the central Indian tribal belt, in the states of Gujarat, Maharashtra, Jharkhand, and Odisha, it was observed that most tribal families were trapped in poverty despite having all the necessary natural resources such as land, water, forest, and labour from their own families and homes. This highlighted the villagers' central issue that owning resources was inadequate if their full potential could not be recognised and would not yield the expected results.

Small and marginal farmers depended on their harvest primarily for self-consumption and the sale of any surplus for additional income. Since most farmers could not utilise their resources to their maximum potential, the outcome was low harvests and, often, negligible profits. These regions suffered due to small landholding sizes, undulating lands, lack of irrigation sources, lack of affordable energy for irrigation, poor infrastructure, high dependence on the monsoons, and multiple existing gaps in the value chain system. Additionally, market linkages are poor since these areas have no history as supply hubs driven primarily by profit motives stemming from business perspectives that the selected clusters lack.

The lack of knowledge about improved farming methods and infrastructure support made it difficult for smallholders to approach the idea and aspirations of "Lakhpati Kisan." Tribal farmers lacked awareness and access to information, institutions, technology, quality resources, and markets, which rendered agriculture unsustainable and vulnerable in the long term. These conditions made farmers believe their state of deprivation was impossible to overcome. However, LKP aimed to improve their incomes and livelihoods,

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resonating with the aspirations of the communities and the goals set by CInI. The larger challenge was improving livelihoods through agricultural development. The CInI team and farmers created a holistic understanding of the gaps within the chain that needed fixing and inculcated a risk-taking ability within the communities, building the necessary links in the value chain system.

To achieve LKP's target of increasing farmer incomes, a focused approach was required in every area associated with different agricultural practices, crop baskets, etc. CInI understood that the income goal could only be permanent by bringing in changes in the entire agroecosystem and not by making standalone interventions at the area and individual farmer levels. Therefore, CInI first identified the gaps.

The CInI team and community members formulated customised interventions to best fit the local needs of the farmers, a process requiring constant review and modification of the blueprint. These interventions changed when gaps were identified at the grassroots in the initial years of LKP. CInI identified how to tackle shortcomings of the agroecosystem sequentially. Some examples were increasing productivity from small landholdings, creating a provision to make the land better suited for agriculture, such as irrigation facilities, shifting focus from monocropping, layering activities in limited land areas to increase productivity, and linking crop selection with market surveys to improve profits from the surplus sale.

- As a major roadblock was small, fragmented farmlands, CInI and the farmers aimed for a return of Rs. 1,000 per decimal (1 decimal = 0.01 acre) of land through the layering of high-value crops (vegetables, floriculture, fruit orchards, spices, etc.) and other associated activities.
- Shifting from monocropping to multi-cropping and adopting high-value crops along with cereal crop cultivation ensured food security and provided revenue. This layering process improved productivity from the limited land resource and developed collective bulk production, which ensured higher returns through sustained buyer-trader interaction throughout the year.
- Since the central Indian tribal belt comprises mainly rainfed areas, developing water resources for irrigation coupled with improving the water use efficiency of crops was one of the primary focuses of CInI's work in the agricultural domain.
- To address the key gap of quality and healthy seedlings for promoting vegetable expansion, micro-entrepreneurship for polyhouse nurseries was introduced.
- Community-based institutions were also created that connected farmers to market information and provided financial assistance to procure

capital inputs for the farming season. These institutions helped farmers procure good quality inputs and extension support for the programme's success.
- Improved market linkages were created to guide the farmers about product demand, helping them make better choices and decisions for crop planning.
- Package of Practices (POP) for certain important crops was identified, and these advanced agricultural practices were shared with the farmers.

The objective of the entire mission was not only to improve farmers' livelihoods even after CInI withdrew but also to change the community's mindset to accept new methods and creative approaches, which were a mix of new and old ideas. It also brought together and connected community members in a way that could later form meaningful exchanges of information and ideas. These changes had a positive impact on bringing people together for development at a community level, creating waves of irreversible changes, and busting the myth around "small land generating small incomes." This led to the empowerment of communities and boosted their confidence.

This chapter is divided into six sections: Section 3.2 focuses on identifying the hurdles that led to poor incomes of small landholding tribal farmers in the selected clusters; Section 3.3 highlights the approaches for strengthening and enhancing agricultural intervention as a key livelihood prototype; Section 3.4 addresses the key agricultural interventions integrated with technology under the Lakhpati Kisan Initiative; Section 3.5 studies its impact on agricultural livelihoods; Section 3.6 critically analyses the implementation of such project at the grassroots level and the next phase of the Lakhpati Kisan Mission; and Section 3.7 summarises the chapter's key learnings.

3.2 Problems in Agriculture-Based Livelihood in Central Indian Tribal Belt

The livelihood issues of people residing in rural, remote areas of the central Indian tribal belt were very specific. Most small and marginal farmers grew barely enough for their consumption. There was negligible scope for surplus which they could sell to make ends meet, and income earned from agriculture was very low due to several factors, as shown in Figure 3.1. The village youth thought agriculture was an unviable option and preferred to migrate for skilled and unskilled jobs.

Despite high groundwater levels, rainfall, and surface water in these pockets, these areas remained underserved by irrigation. These regions received medium to high but irregular rainfall and the topography of these regions was serious hindrance to its optimal utilisation. Most land under cultivation was undulating, and therefore, in the absence of treated uplands, excessive

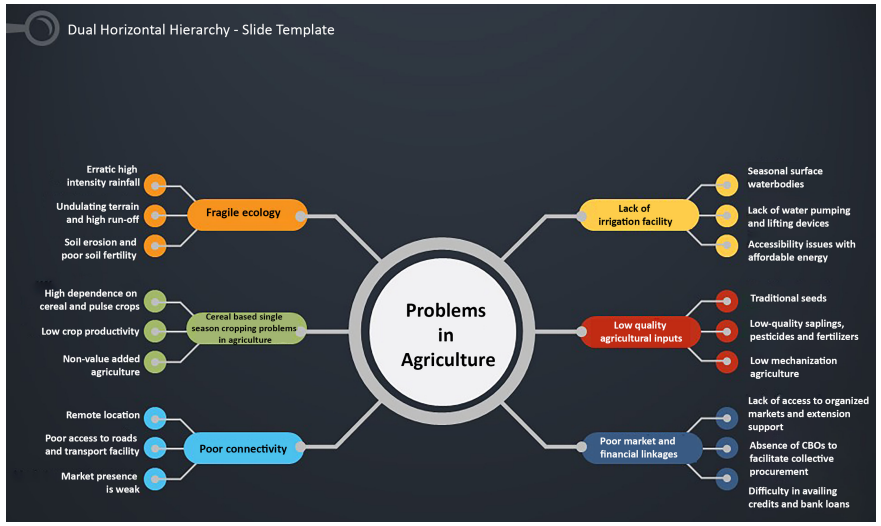

FIGURE 3.1 Problems in Agricultural Livelihood in Tribal Villages across Four States of CInI's Programme Areas.

Source: Author's Compilation.

rainfall resulted in runoff, which washed off the fertile topsoil, degraded the soil, and impaired water management.

This, in turn, reduced water and crop productivity and gave rise to high-yield gaps. Farmers depended on groundwater for irrigation through shallow wells, ponds, tube wells, etc. However, this required private investment by farmers to create wells/bore wells: a diesel or electric power pump and the water distribution pipe to lift water from the source to their fields. Although government subsidies were available for some of these assets, only a few farmers knew of them. The quality of work in government schemes was often found to be good in technical terms, but community engagement is the missing piece in the majority of such sites. In some cases, the specific sites of water bodies were not identified as this required community involvement, leading to the under-utilisation of resources. These schemes remained out of reach of small farmers for these reasons, which will be further discussed in Chapter 5.

Agriculture for small and marginal farmers was a gamble with the monsoon. In the rainy season, long dry spells required bridge irrigation to cultivate crops. However, as only a few farmers had irrigation assets, they cultivated sub-optimally and avoided farming in the winter.

Moreover, they lacked access to affordable energy for their pumps. Most pumps were diesel-powered, which was getting expensive. In many cases, diesel and spares were not readily available. If a farmer owned land on

higher elevations, there was a need for high-powered pumps that required more fuel, resulting in higher costs. To manage the cost, farmers sometimes mixed local oils or kerosene with diesel, reducing the pump's efficiency. Even if a farmer wished to rent a pump from large farmers or local dealers, the rents were high and not commensurate with the crop output. The three-phase electricity connections required for electric pumps were a rarity. The electricity supply was erratic and of poor quality, damaging pumps. Thus, groundwater extraction for irrigation using electricity as an energy source was not viable for individual farmers in these villages. Jyotigram Yojana was a great government initiative in Gujarat to ensure a 24-hour, uninterrupted, 3-phase quality power supply to rural areas. Still, the waiting time for getting an electricity connection was very long. These factors led to a lack of interest in cultivating the entire land.

The tribal areas were often remote, with poor access to roads and markets. Therefore, the farmers could not easily access quality seeds, fertilisers, or pesticides. Sometimes, the local shops in the blocks kept inferior materials at prices that small farmers could not pay. This imposed additional transport and transaction costs. The tribal farmers had small and fragmented landholdings. Due to a lack of physical and human resources, farmers could not cultivate the entire area. Even with the land and some access to irrigation, the crop command area per farmer was low because of labour shortages. Small farmers wanted to manage their farms with their labour to avoid hiring seasonal labourers. Time was crucial in sowing or harvesting, which needed to be completed while suitable conditions lasted. The farmers were bound to suffer losses if these tasks were not done in time. Institutions such as societies registered under the Cooperative Act, and farmer producer organisations (FPOs) were absent. These could have improved collective bargaining. Market vendors/traders were also not interested in reaching out to these areas because of small profits. The farmers found it difficult to sell their produce at optimum rates without organised markets. Since crop productivity was low and they received low prices for their commodities, farmers earned hardly any profits. They saw no point in expanding farming or investing more money or effort. The cereals and other field crops needed less labour and could be cultivated with lower risks and investments. But they also fetched lower returns that were insufficient to sustain a family. Hence, farmers migrated to work either as farm labourers or in cities.

Farmers did not know how to be part of an optimal value chain for their crops, diversify to high-value crops, or adopt different technologies and equipment that could improve crop productivity. There was a lot of misinformation regarding equipment, operation and maintenance, and relevance and benefits, which made small and marginal farmers hesitant to adopt new technology. Also, even after government subsidies, there was a high cost associated with adopting these technologies, e.g., drip-irrigation systems.

This often required farmers to take loans or credit from banks, which was a tedious and lengthy process. A small or marginal farmer might make an effort if he was clear about the utility and cost-effectiveness of the equipment. Adopting innovations also meant a shift towards high-value crops, but crop diversification meant nothing without the proper market. These farmers did not know where the market was, or how to handle packaging, pricing, and sales in keeping with seasonal demand.

Even if a small or marginal farmer overcame all these hurdles, her/his biggest fear was a market failure. Poor market linkages were a key constraint in tribal areas, which directly and indirectly dictated all other parameters and trapped farmers in poverty.

3.3 Approaches for Strengthening and Enhancing Agricultural Interventions

After rigorous research in the selected clusters, the CInI team and the community identified the gaps in the agriculture value chain to be addressed immediately. The team built an approach around community participation both during and after the development process, empowering them until they became self-reliant in operating the mechanism without external support. While the blueprint provided a foundation for the mission, the plan outline was customised to strengthen the weakest link in the chain of the particular cluster, establishing an efficient system that would assist farmers in reaching the Lakhpati mark.

The most crucial step in developing a programme for community upliftment was including the people in the plan, helping them see the potential of their resources and encouraging them to aspire to higher incomes from farming. It was essential for community members to understand the importance of the mission and how it would help them in the long run, so they participated actively in the process. Such a partnership ensured transparency between the organisation and the community, with both involved in the planning, formulation, implementation, and post-implementation management of interventions.

After rapport-building between the CInI team and the farmers, the latter were educated about the LKP, its objectives, and the course of action. The CInI team helped farmers find correlations between their poor economic conditions and livelihood, with a discussion facilitating the identification of the cause-and-effect relationship between their crop cultivation practices and poverty status. These exchanges were able to underline the obstacles requiring immediate attention, such as poor or no irrigation facilities, substandard agricultural inputs like seeds, fertilisers, and pesticides, deficient links with market demands and knowledge, etc.

The mission's objective could only be fulfilled if conditions for crop cultivation could be improved throughout the year and not just during the kharif season. This meant shifting the focus from self-consumption to a commercial orientation and promoting production hubs through changes in the agroecosystem. First, irrigation was necessary as without water, it was impossible to maximise kharif production or expand rabi cultivation. Initial market surveys highlighted a great demand for high-value crops such as chillies, tomatoes, ladyfingers, gourds, onions, eggplants, etc., which could fetch greater profits. But the shift to these crops was only possible with assured irrigation. Old water structures were renovated, new ones were made, and pumping arrangements were made. Farmers were also trained in new techniques such as maintaining crop geometry, soil nutrition management, different intercropping pattern adoption, pest control, timely and precise irrigation, etc. After monitoring the success of these methods on a few farms, the community was assured of their success, and their enthusiasm for learning these methods also increased. This behaviour change played a pivotal role in the programme's success later.

Apart from training and educating tribal communities, the development of entrepreneurs, institutions, or both at the village and cluster level played a key role in filling major voids in the service delivery and value chain system. These entrepreneurs and institutions were vital in planning, implementing, and monitoring the interventions and acted as a bridge between farmers, markets, and capital sources for investments. Self-help groups (SHGs), Village Organisations (VOs), and federations/FPOs were instituted as platforms of accessibility to affordable capital investments, market knowledge, and demand feedback. These alliances helped the farmers connect with government departments to avail of policies formulated for their benefit. Embracing new technologies as well as high-value crop cultivation required the generation of market linkages from scratch. Linkages also aimed to connect farmers to initial capital inputs and loans to accelerate the implementation of existing programmes and develop scale-up for the future. Receiving financial help on time assisted the farmers in promptly procuring seeds and starting the farming process as scheduled.

The federations/FPCs created both backward and forward linkages, connecting the farmers to quality input providers as well as to buyers and producers to promote collective marketing, packaging, and warehousing of produce to help farmers get a high and fair price for their harvest. FPCs were set up to connect producers and traders. This marketing system ensured fair price discovery for farmers through calls to traders and the placement of an electronic weighing machine at the production point. The network's collective purchase and sale networks reduced the transportation cost of harvests and procurement of quality input material. Both farmers and SHGs supported such open and transparent transactions.

Newer ventures were also promoted among farmers with new inventions, technology, and infrastructure such as drip irrigation, water sources, trellis systems, quality seeds, soilless seedlings, etc. One such area was agri-entrepreneurship and rural enterprise, which was encouraged by the rapid development of rural institutions. Focusing on new service delivery systems, the community moved closer to viable development as services were generated and delivered to the farmers' doorsteps when needed. With an increasing demand for inputs such as quality seeds, soilless saplings, natural fertilisers, etc., many rural farmers became entrepreneurs as providers of the services. This generated confidence among tribal communities to adopt progressive practices pertinent to the local context, such as soilless saplings and polyhouse nurseries. Its demonstrated success among entrepreneurs had a ripple effect within communities, motivating other community members to pursue new means of prosperity.

One difficult challenge in implementing such changes is ensuring long-term community acceptance. This requires a shift in mindset towards new information, an essential component in maintaining the permanence of improvements sanctioned by the community and for change to be sustainable. Training and capacity building, behavioural changes like hiring labour, exploring markets and their dynamics, linkages with value chain actors, and investment in farming such as quality seeds and inputs, soil health, and irrigation were important steps towards independence from external aid. To stimulate a holistic response effect, all agricultural problems and psychological hesitancy were addressed through partnerships and synergies with various stakeholders, helping communities take over tasks of collective development and reforms to maintain their autonomy, giving way to a community-centric approach to the effective development of the rural population. The presence of value chain actors with their services and products is probably the most crucial enabler for irreversible impact. The initial participation by early adopters and their success is key to the scaling up of any interventions. There have been numerous instances where the success of one hamlet has fuelled the adoption of new farming practices by adjacent villagers.

3.4 Key Agricultural Interventions

Agriculture being the main source of income in tribal hinterlands, it becomes imperative to stabilise and strengthen the agricultural livelihood by prioritising existing low productivity and bringing it to optimum levels. To be profitable, all the parcels must generate high returns. Good crop productivity is an output of certain interlinking elements. It requires concentrated efforts in almost all spheres, starting from year-round irrigation support, access to quality inputs, involvement of technological innovations, crop diversification to high-value crops, etc. Moreover, it requires the strategic integration

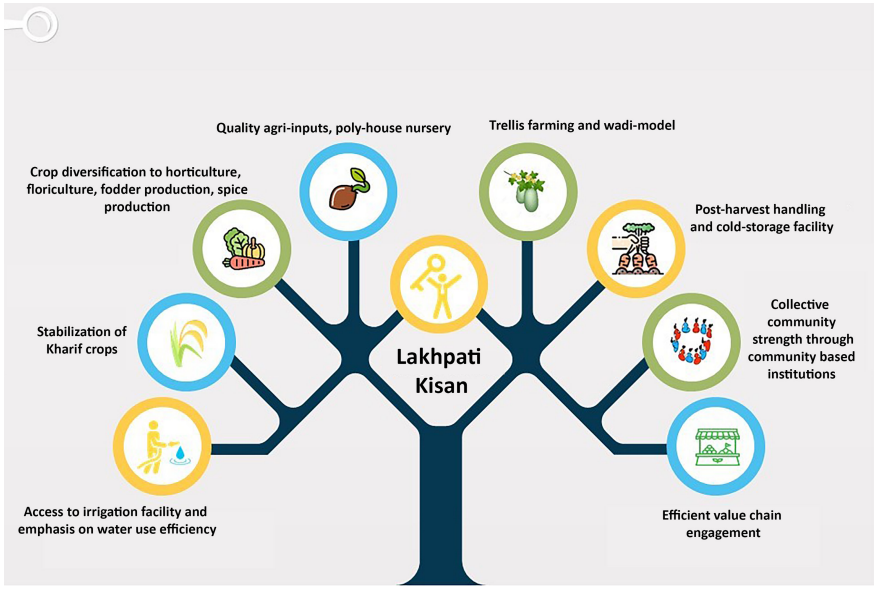

FIGURE 3.2 CInI's Key Agricultural Interventions towards Making Tribal Farmers Lakhpati Kisan.

Source: Author's Compilation.

of farmers with regional markets to give them a fair chance at good returns. CInI focused on domains (Figure 3.2) by identifying the gaps and facilitating an ecosystem in which farmers could create opportunities, condense vulnerabilities, and ensure sustainability in earning an irreversible economic fortune from agriculture.

3.4.1 Collective Community Strength

As an individual enterprise, CInI organised farmers into clusters and ensured coordination between them before initiating any kind of intervention so that collective production could be carried out and have more market weight. All the participating farmers were organised into SHGs/lift irrigation federations, which also highlighted the importance of women in the community. Working with SHGs helped the CInI team to engage with women and identify women as farmers and not just farm labour. All these community groups were spearheaded by Community-Based Organisations (CBOs) such as VOs/Village Institutions (VIs) and apex bodies (federations), which could articulate the collective demands of members and negotiate with different stakeholders on their behalf. To ensure inclusion, representatives from each group were given a spot in the institution. The institutions were assigned

TABLE 3.1 Gross Income from Commercial Crops/HVCs in Summer, Kharif, and Rabi. Average Annual Household Income in 2021

Season	*Crop*	*No. of HHs*	*Area (Acre)*	*Productivity (Q/Acre)*	*Income per Decimal*
Kharif	**Brinjal**	8,264	1,180.99	99.7	2,716
	Chilli	11,022	1,850.86	27.6	1,605
	Tomato	8,605	1,193.28	88.1	2,987
Rabi	**Brinjal**	4,905	589.91	69.4	1,676
	Chilli	6,266	723.49	27.1	1,433
	Tomato	4,936	547.90	102.7	2,595
Summer	**Cluster bean**	3,491	764.31	25.6	561
	Okra	2,415	434.68	21.3	539
	Tomato	2,518	292.63	75.3	1,275

tasks which included demand generation, mobilising contributions from participating households, active participation in creating infrastructure as well as service, ensuring regular operation and maintenance of the created infrastructure, and loaning out to individual farmers through revolving funds so that they could make private investments in digging bore wells or installing drip irrigation units on their farms, etc. (CInI Annual Report, 2015). The early adopters of agriculture-based developmental models and local youth volunteers were trained as Community Resource Persons (CRPs) and Local Resource Persons (LRPs) who played a significant role in facilitating the overall implementation, management, and extension of planned activities (CInI Annual Report, 2015). The interventions conducted in clusters made community members self-reliant and empowered them to make decisions and perform tasks independently. It boosted their confidence and enabled them to act as a professional body and take charge of their situations. Table 3.1 shows the number of households across four states of CInI's programme areas organised into self-help groups and receiving guidance regarding farming practices from 2014–2015 to 2019–2020.

3.4.2 Access to Irrigation Facilities

Creating irrigation assets was the first step in bringing changes to the agro-ecosystem. It started with creating assets such as lifting devices and continued with crop planning and marketing. The need for water assets in rural

households arose from the Lakhpati goal. Thus, to reduce dependency on the monsoon and build farmers' resilience towards weather extremes, CInI tried to provide year-round irrigation to at least 30 decimals of land per household. To achieve this in each hilly area, CInI used a multi-faceted contextual approach to create irrigation potential and expand irrigation coverage. Firstly, it desilted and deepened existing ponds and renovated wells in areas with defunct water infrastructure to increase their storage capacity and expand their command area. Secondly, it created new rainwater harvesting structures in areas without this infrastructure, mostly in low-lying seepage areas, and optimised their usage with appropriate pumping and lifting devices. Thirdly, in areas where irrigation access was poor due to a lack of water pumping and lifting devices, it enabled irrigation by facilitating these devices. It also worked on increasing the water use efficiency of the crops through the promotion of drip irrigation systems. The details of the irrigation intervention are covered in Chapter 5.

3.4.3 Improved Cultivation: Stabilising Kharif Field Crops

The LKP interventions in agriculture aimed to strengthen rainfed agriculture and stabilise kharif production through supplemental irrigation to bring crop productivity to par with national levels. CInI concentrated on increasing productivity by making small yet effective changes in practice, such as maize, paddy, and different pulses. Through collaborations with state and national agricultural universities, it developed a package of practices suited to the individual geographies and climate. It shared knowledge and technical support with the tribal farmers. In Jharkhand, where paddy was the major crop, knowledge about improved paddy practices was communicated through an Information, Education and Communication (IEC) toolkit named *Safal Fasal*. It consisted of 32 designed paperboards showcasing 6 steps pictorially. The toolkit was significant for pre-season micro-planning and weekly and monthly monitoring meetings between CRPs, LRPs, and SHG group members (CInI Annual Report, 2015). CInI also introduced appropriate post-harvest technologies to reduce crop loss and maintain quality, feed and starch processing, and storage technologies. In the Khedbrahma block of Sabarkantha district, Gujarat, FPCs collected pulse produce from farmers. Earlier, they used to sell the raw produce, but later, mills were set up, and the pulses were processed and packed under the brand SAFE, which fetched better prices.

3.4.4 Crop Diversification to High-Value Agricultural (HVA) Crops

There was a shift to high-value agriculture (HVA) crops, including vegetables, floriculture, and fruit orchards. CInI overcame initial resistance by

creating an ecosystem where the farmers could access all the requirements conducive to adopting the HVA model. The HVA crops demanded water; therefore, affordable water resources with convenient access were built before their promotion. The unit size of cultivation was decided according to the farmer's capacity to invest monetarily and in household labour. Backward linkages were established so farmers could access quality inputs throughout the year despite their remote location. Farmers were organised into clusters to create substantial demand, which could attract licenced vendors for seeds, fertiliser, and crop protection products. Moreover, the aggregate of their produce could appeal to potential buyers. Issues of quality plant saplings were eliminated by developing poly nursery entrepreneurs who would grow disease-free, soilless saplings in-house. Deliberate efforts were put into setting up a good market linkage so that farmers get fair prices for their produce.

3.4.4.1 Commercial Vegetable Production

CInI promoted vegetable clusters in the tribal areas to ensure good commercial vegetable cultivation. Women members of SHGs were encouraged to take up vegetable cultivation, which helped them earn more as it gave better returns than cereal crops. The disease-free, healthy, good-quality soilless saplings from polyhouse nurseries also ensured maximum plant survival and minimised losses for the farmers. Farmers were trained in strategically carrying out transplantation at specific times. Vegetables were cultivated in an open rainfed system, with irrigation support and a drip irrigation system that provided maximum returns. Drip and mulch increased water use efficiency and productivity, giving more crop per drop and reducing water and fertiliser requirements and weed growth. Watermelon, ladyfinger, chilli, and other such crops performed well under drip and mulch systems and earned farmers substantial returns (Table 3.1).

3.4.4.2 Promotion of Trellis System for Growing Creeper Vegetables

The trellis (*mandap/machan*) system helped farmers grow creeper vegetables such as bottle gourd, bitter gourd, ridge gourd, sponge gourd, cucumbers, brinjals, tomatoes, etc. The limited amount of cultivable land was one of the many gaps identified for low yields along with other economic and geographical restraints. The trellis system was a feasible intervention to efficiently use the limited space and boost yields. It involved the erection of permanent trellises, usually made of cement bars, for the efficient cultivation of creeper vegetables. The bars supported the climbers and increased their exposure to sunlight and aeration, resulting in more flower buds and fruit of superior size and quality. Thus, the trellis system led to the cultivation of

both superior quality and quantity of vegetables, in addition to creating a double-tier system where the lower region of the trellis land was utilised to cultivate underground shade-loving crops such as ginger, potatoes, turmeric, etc.

The types of vegetables to be grown were decided based on the agro-climatic conditions of the place, market demands, and rates of the vegetables. Production was carried out on individual lands and later aggregated to facilitate marketing. The layering of vegetables through the trellis system was one of the ways to increase farmers' income in sections. In five years of CInI's work, around 163.97 acres of land in programme areas of Maharashtra have been brought under the trellis system (Table 3.1). The trellis was erected through private investments by farmers or credit loans through village institutions.

3.4.4.3 Fruit Orchards: Perennial and Annual (Wadi Model)

Using the Tribal Development Fund, the National Bank for Agriculture and Rural Development (NABARD) sponsored numerous welfare initiatives for the country's Scheduled Tribes. NABARD's *Wadi* project was an example. *Wadi* essentially refers to orchards. Under this scheme, a *Wadi* plot typically covered 0.75–1 acre per small and marginal farmer. To reduce climatic and commercial risks, two or more crops were intentionally chosen for intercropping with the fruit trees. Fruit trees such as cashews, mangoes, litchis, papayas, and other tropical fruits were planted with crops on the land. The *Wadi* model's main principle is to turn the tribal household's degraded or uneconomical wasteland into a productive asset by planting fruit trees, intercrops, multipurpose forestry tree species, fencing, and soil and moisture conservation measures. CInI tapped government schemes (National Bank for Agriculture and Rural Development (NABARD) and BAIF Development Research Foundation) to promote perennial and annual fruit orchard development in their tribal work locations. This added another layer to farmers' income and ensured a step towards sustainable livelihoods.

3.4.4.4 Promoting Fodder Production and Improved Spice Production

Fodder production: Earlier, farmers used to plant a lot of maize seeds all together in the soil, and as a result, due to high crop density, they could harvest a large amount of green fodder, but the grains were small. CInI discouraged this practice and promoted cultivation with fewer seeds. As a result, grain size improved from a commercial perspective, but fodder yield was reduced. To cope with this decline in fodder availability, CInI promoted cultivating and harvesting fodder (sorghum) on a dedicated plot.

In the last two years (2015, 2016), CInI demonstrated and promoted silage production for milch animals across all the clusters. The maize was harvested at a stage where milk was filled in the cobs, and then chopped in the thresher. Anaerobic conditions were created, and the chopped maize was mixed with salt, jaggery, and water and left covered for 40–45 days, during which it underwent fermentation and formed silage. It acted as a good cow feed, provided good nutrition to them, and increased milk yield.

CInI upscaled *Azolla* cultivation, an aquatic fern that grows in submerged conditions. It is known for its nitrogen-fixation abilities and blue-green algae, which thrive with the fern as a symbiont. *Azolla* was cultivated in ponds, ditches, or controlled conditions like readymade plastic bags. *Azolla* has high protein and vitamin content and is a very nutritious feed for livestock, making it an ideal substitute for regular farm-waste fodder. *Azolla* cultivation helped produce quality fodder for livestock animals and acted as a nitrogen fixer and bio-fertiliser for farm crops.

Floriculture: CInI encouraged its farmers to diversify their crop baskets and income sources to reduce agriculture-related risks. Gujarat was the focal point of floriculture promotion by CInI, where tribal smallholders on both permanent and seasonal plots adopted it. During the kharif season, marigold was cultivated extensively, and in the rabi season, chrysanthemums were the main flower. As a result, farmers from tribal regions of Gujarat could earn 20–30% of their annual income from floriculture. These flowers were sold via traders at the local flower market. Apart from this, they were sold as garlands or petals in marriages. The members of the farmer's family helped make garlands and sold them on highways or near temples. Farmers sometimes used cold storage facilities to keep flowers fresh and earn a fair price for their produce and sales to meet the high demand during the festive season.

Spice production: Being a high-value cash crop, the cultivation of spices was supported by CInI in all four states. Chilli was cultivated across all clusters (Figure 3.3) and sold fresh and green in the market. However, if the market rates for chilli were low, it was dried and sold as dry red chilli. Turmeric cultivation was taken up exclusively in Gujarat (by 122 HHs on approximately 14.95 acres of land and 471 HHs on 88.74 acres of land) and later in Maharashtra (by 4 farmers on 1.6 acres of land and 1 farmer on 0.36 acres of land). It was sold both as fresh and dried turmeric. The percentage of curcumin present in the turmeric grown in these areas was 4–4.5%, which was considered good. In Gujarat's Dahod and Khedbrahma regions, turmeric was licenced by FSSAI and packed and sold under the Sadguru Brand in 50- and 100-gm packets in Dahod and adjoining districts. Larger packets up to 250 and 500 gm were sold to caterers. The federation has also tied up with *masala udyog*. Fresh green coriander, fennel, fenugreek, ginger,

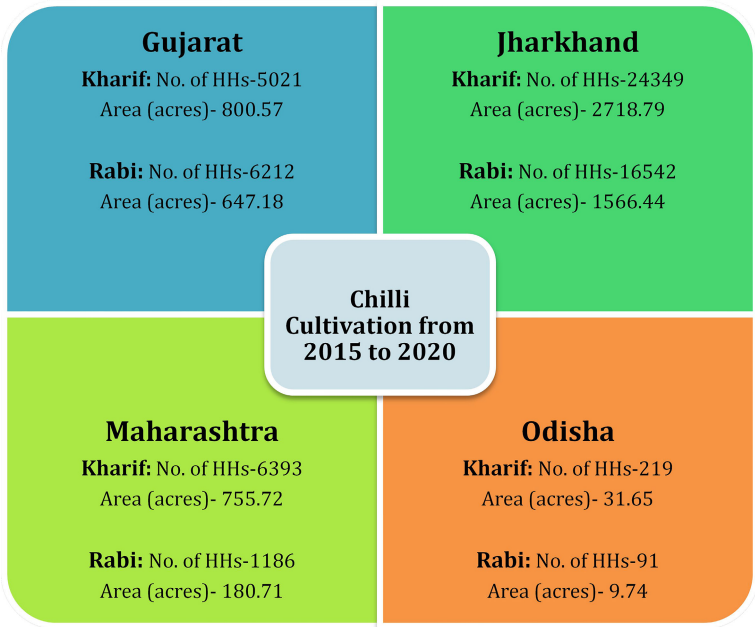

FIGURE 3.3 Total Number of Households and Area under Chilli Cultivation across All Clusters in Four States of CInI's Programme Areas from 2015 to 2020.

Source: Author's Compilation.

garlic, etc., were other important spices grown across clusters. The federation obtained an FSSAI licence for all the spice products, including turmeric, cumin, coriander, and chilli.

3.4.5 Access to Quality Agricultural Inputs

The major agricultural inputs are seeds, saplings, fertilisers, herbicides, and pesticides. To make quality agricultural inputs available to farmers, CInI facilitated a deal between farmers and agricultural corporates through community institutions such as producer groups (PGs) and farmer producer companies (FPCs) in the four states (Figure 3.4). According to the demand raised by the participating farmers, an indent order for inputs was placed at the PG or VO and forwarded to the FPC in bulk with the payment. The FPCs, licenced to deal in fertilisers and pesticides, or agri-corporates supplied the inputs mediated by PGs. This resulted in farmers getting quality inputs at a reduced input price. In Odisha, the farmers received inputs through agripreneurs and FCPs (Figure 3.5) trained at the National Institute of Rural Development and Panchayati Raj (NIRDPR), Hyderabad, and were

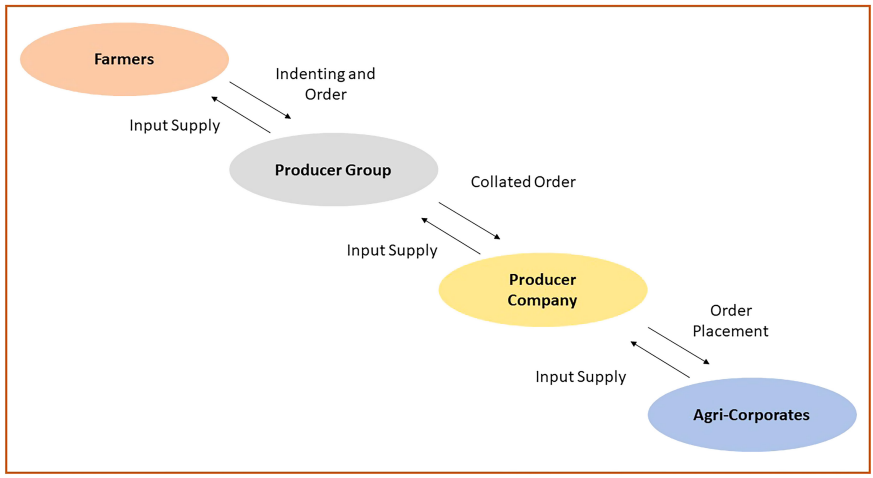

FIGURE 3.4 Access to Quality Agri-Inputs: Operational Model in Gujarat, Maharashtra, and Jharkhand.

Source: Author's Compilation.

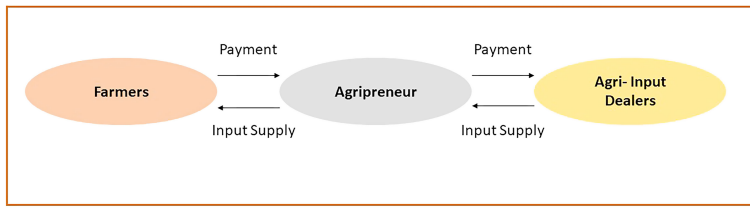

FIGURE 3.5 Access to Quality Agri-Inputs: Operational Model in Odisha.

Source: Author's Compilation.

licenced to trade in fertilisers and seeds. These agripreneurs invested and were financially supported by PG or federations.

In the central Indian tribal belt, vegetables were usually cultivated with a subsistence orientation in the kitchen garden. Insufficient information regarding the market demand for vegetables, lack of access to quality plant saplings, diseases and pests, imbalanced soil nutrition management, timely planting in rainfed conditions, labour requirements, and limited market opportunities were some of the issues inhibiting large-scale commercial vegetable farming. Healthy seedlings contributed to higher productivity by improving resilience, early fruiting, and overall health. Therefore, CInI initiated a community nursery followed by a high-tech commercial polyhouse nursery prototype where healthy seedlings could be grown and made available to the farmers.

3.4.5.1 Community Nursery

Raising vegetable seedlings, especially during the early season, has always been a struggle for smallholders. Growing these seedlings in the open field results in poor germination, weed problems, the spread of fungal disease with more watering or excess rain, and early insect infestation leading to virus transmission. With the increase in seed costs, economic loss to farmers because of these pain points had become significant and, most importantly, there is always a risk of missing the season due to the unavailability of quality seedlings.

The nursery entrepreneurship started against this backdrop as a prototype model among 20–40 farmers with a mosquito net kind of set-up, which slowly evolved into a net of 40 mesh size. The 40 mesh net was introduced to avoid early attacks by sucking pests. While the infrastructure was established with the help of grants, the farmers pooled their resources to raise good-quality saplings in a common place with individual ownership of nursery beds. The entrepreneurs were selected and trained in the different nurseries and entrepreneurial operations. The farmers carried out all the activities in the nursery, from bed preparation, sowing, weeding, and watering to plant protection measures. The saplings had a high germination and transplant rate. The community nursery had a capacity of 75,000 saplings per cycle. Common nurseries were mostly a management strategy for introducing vegetable cultivation in a new region. They provided farmers many possibilities, such as growing seedlings for themselves and others.

3.4.5.2 High-Tech Commercial Vegetable Nursery by Agripreneurs

Community nurseries had setbacks due to weather conditions: storms, high-intensity rainfall, and soil erosion, which damaged saplings. To mitigate these risks, a service-led model of high-tech polyhouse nurseries was introduced by CInI that produced soil-less, disease-free vegetable seedlings. This technology was based on an Israeli model and significantly reduced the risk for commercial vegetable farmers. However, the model was modified based on local conditions. The size of the polyhouse was reduced to 336 square metres considering the local demand. Naturally ventilated polyhouses were constructed in place of semi-automatic polyhouses. The polyhouse nursery could produce 1–1.2 lakh saplings per cycle. It required around Rs. 3.7 lakhs for setting up the infrastructure, of which 40% was contributed by the entrepreneurs and 60% came as a grant from CInI or Tata Trusts. The entrepreneurs completely bore the cost of land levelling and working capital. CInI appointed farmers as entrepreneurs based on definite criteria, as mentioned in Box 3.1.

Box 3.1 Possible Criteria for Selection of Poly-Nursery Entrepreneurs by CInI

- A successful farmer with a well-managed farm/farming operation.
- The farmer is considered an expert in his/her area.
- The farmer is interested in giving extension support and leadership.
- The farmer is deeply interested in agriculture, tried innovative methods regularly at his own level, and has a risk-taking capacity.
- Expanded the business gradually.
- Able to handle accounts, documentation, and basic arithmetic comfortably.
- Ability to contribute capital to initial start.

Source: Author's compilation.

The key learning from this innovative prototype was:

a) Increased demand for seedlings also led to an increase in vegetable crop demand.
b) Easy, hassle-free access to quality seedlings helped farmers to take early crops that ensured higher rates for crop produce. (Figure 3.6 and 3.7)
c) Selection of the entrepreneur is key for the success of the prototype. Key criteria such as the ability to compute, being an experienced farmer who is familiar with the area, suitable upland for a polyhouse with proper aeration, better road and mobile network connectivity, and the ability to invest in the down payment are to be followed.
d) Consultation and support from experienced nursery entrepreneurs help in better skill transfer for new joiners.

Farmers in Gujarat, Maharashtra, and Odisha would directly buy seedlings from nursery entrepreneurs (Figure 3.6) at the cost of Rs. 1 per sapling. In Jharkhand, FPCs helped connect entrepreneurs with the farmers (Figure 3.7). This prototype made it convenient for the farmers to access quality seedlings year-round whenever required. It provided farmers with a hassle-free, ready-made supply of seedlings at their doorsteps and shifted the burden from smallholder farmers to nursery entrepreneurs, creating a constant demand by farmers. It enabled farmers to take vegetable crops early in the pre-kharif season, which was not the case earlier, and allowed them to access PoP guidance for producing vegetable crops at the field level. Above all, it gave them a new perspective on technology. It helped generate employment and additional income for the entrepreneur-cum-farmers with small working capital in short business cycles of two months each. There was no competition, and entrepreneurs enjoyed the first-mover advantage. Through

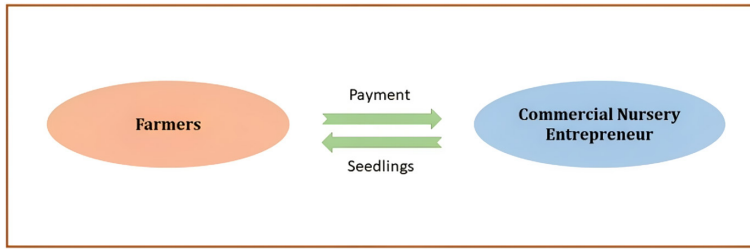

FIGURE 3.6 Access to Quality Seedlings: Operational Model in Gujarat, Maharashtra, and Odisha.

Source: Author's Compilation.

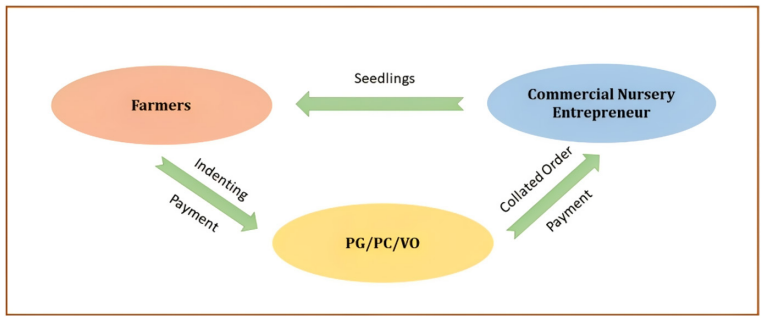

FIGURE 3.7 Access to Quality Seedlings: Operational Model in Jharkhand.

Source: Author's Compilation.

technical guidance and handholding support from CInI and partner NGOs, the nursery enterprise developed risk-taking, progressive farmers who were self-reliant and operated the nurseries with almost negligible support from the CInI team, thus fulfilling the goal of permanent impact.

3.4.6 Composting for Enhancing Soil Health

CInI promoted the use of compost for enhancing soil health. Few farmers were already making vermicompost on a small scale. CInI supported them and developed commercial setups. As a result, farmers in the Garbada and Limkheda blocks of Dahod District made surplus vermicompost and sold it to nearby farmers with the help of the federation. Some farmers in Gujarat made NADEP compost, while others used Wonder Life liquid to make bio-compost. Organic compost substituted chemical fertilisers and promoted soil health.

3.4.7 Disbursement of Knowledge of Advanced Agronomic Practices

CInI deployed trained LRPs and CRPs to share advanced knowledge on agronomic practices. One LRP was responsible for training and monitoring several vegetable-cultivating families. The LRPs were paid a fixed monthly fee. In Odisha, advanced knowledge transfer was promoted through local expert farmers (Figure 3.8). Crop-wise expert farmers were shortlisted based on their willingness to impart field training to new farmers. This was because progressive farmers were low-hanging fruit who acted as magnets to scale the adoption across villages. Every farmer wished to use the same miraculous potions used by these expert farmers, who provided hands-on training to novice vegetable farmers on fertilisation, irrigation, and crop protection techniques. They were paid on a per-day basis.

3.4.8 Post-Harvest Crop Produce Handling

In Gujarat, the post-harvest handling and management of grains were initiated with the support of FPCs. The FPCs provided post-harvest crop handling by offering grading, sorting, packing, and storage facilities to the farmers against payments. FPCs began selling some of the value-added products under their brand name. The sale of surplus crops was also carried out by local traders on contract agreements, creating a network of local merchants, traders, and farmers for future business prospects.

3.4.8.1 Development of Efficient Value Chain Engagement

The most significant part of the crop value chain was undoubtedly market connectivity. CInI, through the LKP, invested in ensuring hassle-free marketing channels for small landholding farmers through various models suited to different geographical locations. Besides selling their produce at local weekly *haats* (local markets), farmers could sell their produce through contract farming or directly to traders in wholesale *mandis* or corporate buyers.

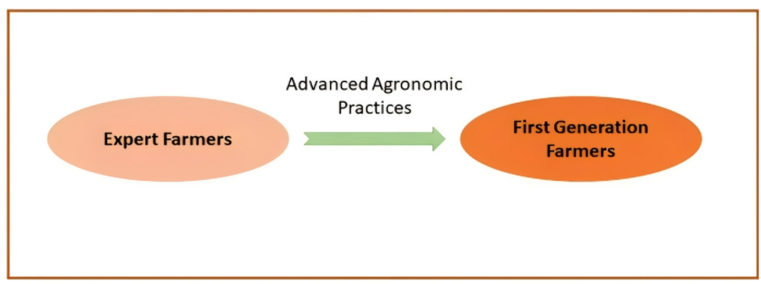

FIGURE 3.8 Knowledge Transfer in Programme Areas of Odisha.

Source: Author's Compilation.

3.4.8.2 Contract Farming

The model was introduced in the tribal areas of Gujarat, where CInI facilitated the creation of a formal contract between a group of producers and a buying firm based on predefined criteria on the quality of produce and price offer. FPC or lift irrigation (LI) federations were actively involved in establishing such linkages for their farmer members. To ensure product quality, the buyer also provided production support.

3.4.8.3 Organic Linkage between Traders and Producers

In Gujarat, Maharashtra, and Odisha, CInI linked the cash crop producers to traders or commission agents in wholesale mandis. The producers collected their produce together at the hamlet level and transported it to wholesale mandis. In Gujarat and Maharashtra, transportation was provided by a third-party service provider that charged per kilogramme for specific mandis and collected farmers' produce from fixed pick-up points. Farmers collected their payments from the transporter and the challan the following day. In Odisha, the daily market rate was sent to all subscribed farmers of the "I am Kisan" application to better negotiate rates with traders coming to villages. Effective market linkage offers were also being made to the subscribed farmers.

3.4.8.4 Marketing through FPC

This model was rolled out in Jharkhand. The FPC actively sought market linkages with wholesale mandis and corporate buyers such as Reliance Fresh. Based on the rate offered and volume of demand, farmers' produce was marketed. The goal was to provide farmers with better rates and returns. Working capital was sometimes utilised for lifting produce from farmers and transporting it to vendors. The FPC was responsible for all logistical arrangements and saved some money for other market expenses.

3.4.9 Operation and Maintenance Services of Farm Assets (Pump, Drip System, Solar Units)

Operation and maintenance services were critical for catchment farmers to ensure prolonged and sustainable use of the equipment and an irreversible impact. FPC or LI federations assumed dealerships for these farm assets in Gujarat and Maharashtra, and as a result, they provided O&M support to their members. In Jharkhand, farm asset vendors were contacted regularly for capacity development and fixing faults. In Odisha, vendors were influenced to hire local people based on a defined business scale for attending to faults.

3.4.10 Cold Storage Facilities

CInI set up solar-powered cold storage facilities in Gujarat in 2019. It was a decentralised cold storage facility powered by solar panels, installed with the Gujarat government's and Gujarat State-CSR's help. Farmers could store unsold stocks in the cold storage unit, which the federation ran and managed by paying Re. 1 per kg per day. The amount recovered was used for O&M, and farmers got an affordable cooling solution for their produce, which minimised wastage. It was also started in Jharkhand and Maharashtra.

3.5 Impacts

LKP's success in transforming the economic status of poor smallholding farmers positively influenced many lives in the selected 17 clusters spread across the 4 states. The community-centric approach of the mission focused on permanent, sustainable change in the incomes of the farmers by filling the gaps in the existing value chain system, which led to better linkages with good quality inputs and improved productivity as output. The network developed with the markets under the guidance of the CInI team, and the introduction of community marketing played a critical role in merchandising the quality harvest at the right rate, helping the farmers earn a fair share for their crops. The impact was observable not only through the rise in income but also through the rapid adoption of the interventions by many other farmers and the changes in their lives. The average increase in income in all four states can be seen in Figure 3.9. While in Gujarat and Maharashtra, several farmers have already crossed the Lakhpati mark, the achievement is still to pick up pace in Jharkhand and Odisha.

The most observable difference was the use of technology on small farms. While earlier it was believed to be uneconomical and unproductive for such farms, applying context-specific technological solutions and farming techniques under the LKP has debunked the myth around technology and its effectiveness in developing positive results. This was made possible by educating and training the farmers about these technological inputs and their benefits in the long run. The connection between information and practice changed the behaviour of farmers. This helped the farmers assess their situation and allowed them to make more informed decisions about their farming patterns and choices. It encouraged farmers to obtain information on new practices to improve their yields.

CInI ensured farmers' access to quality agricultural inputs such as seeds and soilless seedlings, irrigation facilities, pesticides, fertilisers, and manures, etc., which resulted in better harvests. Bulk quantities and

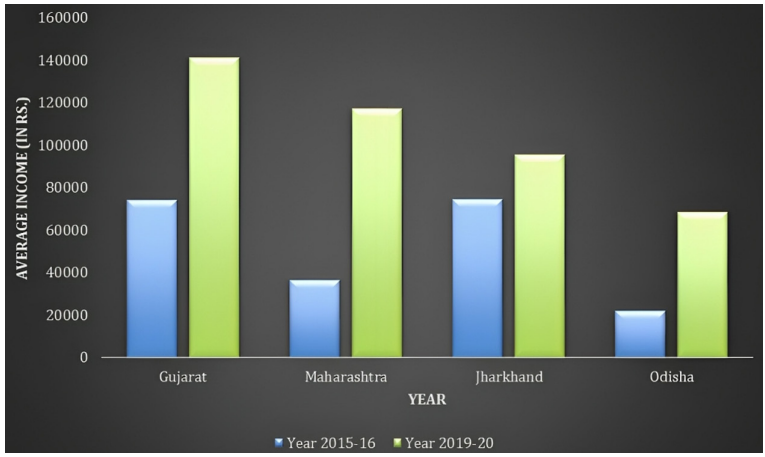

FIGURE 3.9 Average Income from Agri-Interventions in All Four States of CInI's Programme Area in the Years 2015–2016 and 2019–2020.

Source: Author's Compilation.

collective marketing of the final goods attracted buyers and secured higher sale prices for farm produce. Good quantity and quality of crops increased the confidence of the farmers in these interventions, which were largely non-subsidy driven. Apart from good inputs, the shift from mono-cropping agriculture to the adoption of high-value crop cultivation and livestock rearing significantly increased the farmers' income. In addition to improvements in kharif and rabi crops, layering different activities such as livestock, floriculture, horticulture, and entrepreneurship ventures, etc., ensured a steady income for families who earlier relied only on staple crop sales. The initiative helped enlighten the farmers about crop protection from expert counsellors who could find methods to protect the crops from spoiling in the fields or storage.

As the programme progressed and incomes increased, the rapid demand for premium inputs led many farmers to become input providers for soilless saplings. With financial and technical assistance from the CInI team, they invested in and started polyhouse nurseries. These ventures began catering to nearby farmers, providing healthy, soilless saplings at affordable prices, providing an income for agri-entrepreneurs, saving time, and cutting down transportation costs for farmers. It created a delivery system for farmers who now received ready-made saplings primed to be directly planted in the field, saving time and labour for farmers. Box 3.2 states the strategies, interventions, and processes of CInI in piloting successful agricultural livelihood models in the working areas of Jharkhand.

Box 3.2 Strategic Multi-Step Layering and Learnings to Pilot Successful Agricultural Livelihood Model: Jharkhand

The Dumka and Deoghar districts were the working areas of CInI in Jharkhand. The tribal blocks in these districts shared undulating terrain. However, the terraced lands allowed for moisture retention and groundwater recharge. Before CInI's intervention, around 20% of tribal households possessed an irrigation source, while the rest depended on the monsoon for cultivation. Agriculture was the main occupation of the people, but being unprofitable, people usually migrated to nearby cities and worked as agricultural labourers. The annual income of tribal households was around Rs. 30,000.

When CInI intervened in these areas, it aspired to generate an income of Rs. 1,000 from every decimal of cultivated land. It assumed that the farmer would cultivate 30 decimals of land in the kharif season under rainfed conditions and that if irrigation was made accessible, the farmer would be able to cultivate another 30 decimals of land and earn an income of Rs. 60,000 annually. The CInI team utilised the rainwater discharged in low land areas, created seepage wells and ponds, and extended irrigation support to farmers through lift irrigation devices. However, the returns were lower than expected. The lack of quality inputs in the form of healthy seeds, saplings, fertilisers, and pesticides hindered agricultural productivity. Being economically backward districts, these regions lacked both market focus and market linkages. Thus, an FPC was created and registered and was made responsible for creating ties with the vendors and supplying quality inputs to the farmers. The FPC was also responsible for creating market linkages with wholesale *mandis* so that produce could be sold at better prices. CInI set up a community nursery followed by a polyhouse nursery in the clusters. As a result, it was seen that the output increased to Rs. 800 per decimal of land. But the goal of generating Rs. 1,000 per decimal of land was still not achieved. Thus, CInI layered it with another technology by introducing drip and mulch technology in vegetable farming. It was seen that the output surpassed the aspiration target and substantial income was generated by the farmers.

Source: Author's compilation.

The construction of community infrastructure for the collective benefit of villagers, such as irrigation systems and water tanks, mechanical pest management systems, solar power supply, cold storage facilities, etc., provided much-needed relief to farmers. It was essential to ensure a fair share of services to all rather than a particular section exploiting the benefits of the structures. Many infrastructural additions served as initial investments that

would benefit the farmers in the long term, such as trellis structures, water storage, sheds for animals, etc. Setting up institutions such as SHGs, federations, and VOs enabled communities to independently develop and implement community development plans, creating wonderful leaders among ordinary citizens. It became a vital part of the planning, execution, and post-implementation monitoring and evaluation process of the programme. This was a crucial step for reducing the dependency of communities on other institutions to become developed and generating confidence among people regarding taking charge of growth in their own hands. They played a key role in providing information to farmers, establishing market linkages, filling gaps in value chain systems, and ensuring an irreversible, sustained development into Lakhpati Kisans.

It also served as a portal of information regarding new government policies available and methods of availing them, affordable technological advancements in the field of agriculture, market demands and information, etc., which ensured the community could collectively progress without relying on external agencies for funds and information support. The institutions' transparency and the participation of communities in leading them helped build trust between people and authorities. The participatory approach reduced inhibitions concerning these bodies and included people in the entire process, creating trust among the people and restoring faith in the establishment. The institutions monitored the functioning of the developed value chain system and supported the service delivery model of the mission. This initiative included women from the communities taking up important roles in the establishments, which helped switch women's roles in the hamlets from that of labourers to firm contributors and decision-makers. Women holding crucial roles within these bodies were able to influence other women and young girls to lead and became a symbol of gender empowerment.

The linkages to the markets changed the production pattern to a more market-demand-driven approach. This governed the selection of crops to be grown on the limited land resources and additional layering activities to be carried out. It was important to understand the niche demands of the market to supplement farmers' income through year-round agricultural produce rather than depending solely on kharif and rabi crops. It changed the local agroecosystem of the hamlets and encouraged a commercial agriculture perspective, which could prove beneficial in the future due to the market-demand-led approach to farming methods. Developments in these aspects of the communities supported branching out to other major areas, which required improvements such as quality education for all, sanitation and hygiene projects, and access to clean drinking water in these hamlets.

3.6 Critical Analysis and the Way Forward

One of India's economic strengths has been the agriculture sector since the "Green Revolution," which revitalised India's exports and contributed enormously to the country's GDP, with many schemes and interventions introduced to benefit the farmers' incomes and boost the productivity of their land. However, these opportunities and benefits were not equally distributed and enjoyed, with most catering to the large landholding farmers, excluding the small and marginal farmers from the narrative despite the latter being in the majority. This exclusion led to poor performance in the agricultural sector and caused poverty, unemployment, and a lack of proper education and health care.

As stated by Dev in his paper in 2012, "A focused approach can be used to incentivise the formation of farmer's groups and apex organisations and government and others can facilitate in finding solutions to problems of irrigation, inputs, procurement, markets and risk." The available literature has brought to light many issues faced by farmers in the agricultural sector since the Green Revolution. However, we observed very little exploration of tribal small landholding farmers in some of the most untended areas of central India. Also, most literature highlighted the few initiatives to include small farmers in the big agricultural plans, such as government initiatives, value chain systems, and even start-up investments in agri-business. Apart from government policy makeovers and initiatives, effective innovations through start-ups have effectively improved the value chain systems in the agriculture sector, benefitting customers and producers alike (Rao et al., 2017). But these start-ups usually aim for large landholding farmers as they present better opportunities for scaling up, and many small and marginal farmers are excluded yet again due to disruptive value chain systems and a lack of a vast marketing network. These small-scale issues have caused many hindrances to other projects and investments, which could have brought greater developments in these areas. Simply disseminating information about integrated farm practices and new technological advancements in agriculture cannot resolve the issues centred around poverty among small farmers. This highlights the dire need to devise interventions that facilitate the integration of sustainable farming practices and allied agricultural activities in a manner that is tailor-made for the handicaps at the grassroots level of a region, shifting and guiding the small farmers towards better agricultural productivity and prosperity until they are capable of managing it themselves. This initiative must be community-driven to sustain over a long period rather than relying on external agencies for all inputs.

The project's agriculture interventions have received positive feedback from most farmers who are part of this initiative, successfully bringing about monumental changes in the lives of many farmers who previously

battled poverty and hardships. It helped them not only escape the shackles of food and resource scarcity but also gain confidence to be part of the change and turn crises into opportunity with the guidance of the CInI team. The success of the intervention models, such as community infrastructure, high-value crop cultivation, layering techniques, livestock rearing, market linkages, and community marketing, was able to overcome the obstacle of limited land area for agriculture. What was earlier carried out as a custom bestowed by their ancestors became their financial strength. With the key principle centred around identifying the community's needs, it was not an easy feat to accomplish. While a major blueprint of the mission's initiatives could put the needs of the communities into perspective, a "one size fits all" intervention would not suit the needs of the different areas where the mission was implemented. Each area displayed a different need in areas such as agriculture, livestock rearing, entrepreneurship ventures, etc., which called for curating multiple plans from the model blueprint to resolve each region's issues. It was crucial to restructure the models to fit the region's requirements like a glove, to avoid the mistake often made during policy formation, that is, creating an umbrella policy in the hopes that it benefits everyone.

Apart from fulfilling requirements such as building infrastructure and changing agricultural approaches, the focus of the Lakhpati Kisan mission was to bring about permanent and sustainable change. For that to happen, it was important to empower the tribal communities across clusters to become autonomous and reduce reliance on external agents/organisations for change. Capacity building of people through federations and community apex organisations shaped many members to take up active leadership roles for future projects. Although the community initially struggled to actualise this role's importance, it later nurtured many role models and leaders within the people who earlier lacked initiative-taking skills.

The Lakhpati Kisan Mission's successful implementation was able to direct the programme further to more improvements. Observing the mission's strengths and weaknesses at the grassroots level during the first phase, the CInI team was able to draft a blueprint for the second phase to tackle existing problems and bring about further changes in communities. Though the objective of the new phase will remain the same as the previous one, it will focus on issues such as:

1. Mechanised farm solutions with procurement funding available through federations and organisation assistance and mechanical support available on pre-fixed lease amounts.
2. Access to quality agricultural inputs with procurement and transportation of inputs managed by village institutions, as well as promotion of input entrepreneurship among agripreneurs of the villages.

3. Knowledge of advanced agronomic practices by appointing and training local cadres of farmers and crop experts who train participants in selecting crops for harvest and provide advisory support. Expert farmers who are part of the programme will become confident about growing vegetables.
4. Knowledge of integrated pest management (IPM) techniques will be promoted alongside field capacity development and climate-based advisories for the farmers.
5. Market information and linkage by promoting contract farming and creating organic networks between farmers, traders, and producers. Marketing through FPCs will be improved upon to get better profits on the produce sold collectively.
6. O&M services of farm assets (pumps, drip systems, solar units, etc.) to ensure an irreversible impact through proper management of equipment and capacity building for the operation of equipment.
7. Post-harvest crop production was handled by FPCs, who extended the services of grading, sorting, packaging, and storage to grain producers on a payment basis and allowed sales under their brand name.

The technological focus was on protected cultivation, cold storage options, organic farming options, biodegradable mulch sheets, etc. Along with promoting horticulture, floriculture, and drip irrigation for newer crops, the intervention will also attempt to create a digital platform for crop advisory and monitoring to increase the ease of access for each farmer. The core approach of crop diversification for crop selection will be carried into the second phase, along with the expansion of efficient irrigation systems such as drip irrigation to increase vegetable productivity. To make the farmers even more self-reliant, the new objective includes withdrawing grants for recurring agricultural costs and reducing the direct engagement of other organisations in agriculture for old beneficiaries.

The CInI team further aims to document the Lakhpati Kisan Models' prototypes, challenges, and shortcomings to expand this blueprint to other agriculturally underprivileged areas of the country and scale up the project to collaborate with major government schemes to reach an even larger audience. This will also establish government relations with the project and help in the long-term design and implementation of the programme with better monitoring methods.

3.7 Summary and Conclusion

Through its sustainable model, the Lakhpati Kisan Mission's objective to create empowered communities has transformed people's perceptions and lives. From identifying the needs of the communities to repairing the gaps

in the value chain system to connecting farmers and vendors, the CInI team created an ecosystem of self-reliance and change in the right direction. The agricultural interventions, such as the shift from mono-cropping culture, integration of cash crops such as tomatoes, onions, cauliflowers, etc., establishing irrigation systems, linkages with quality inputs and collective marketing, were able to fill the gaps in the existing market linkage systems, which not only improved the production of new crops cultivated but also elevated the production of staple crops grown during kharif and rabi seasons. This approach helped create a year-round income flow for farmers, reducing forced migration among the communities. The economic progress helped pull the farmers out of the clutches of poverty and paved the way for communities to take control of future developments. It encouraged the farmers to expand their horizons to other ventures such as entrepreneurship, with many farmers setting up polyhouse nurseries to provide soilless saplings to farmers, generating employment and income by establishing service delivery systems in the communities. Connecting the right set of people for input procurement and output marketing has created a self-sustaining environment in these hamlets, generating confidence among farmers to take up new approaches to cultivation and generating an atmosphere of self-sufficiency, reducing reliance on external agents for constant financial aid.

The bottom-up approach allows local community members to express their opinions and contribute to the development of their area and community by following their own goals, expectations, and objectives. It allows them to take charge of their situation and progress in the long run. It teaches them the skills for particular work instead of helplessly waiting for some authority to come and do it for them. Thus, it makes them aware, insightful, skilled, and independent. CInI adopted the bottom-up approach for community-centric progressions in all its agricultural interventions. It involved the community members in all the stages of development, from planning to monitoring, and enabled them to become self-reliant and self-sustaining. Through interactions and discussions, CInI recognised the different needs, strengths, and weaknesses of the tribal farmers, ensured transparency in decision-making and financial matters, and, through its decentralised interventions, struck a balance between potential and sustainable development. The community-based approach established an ecosystem where farmers believe themselves to be the doers and the leaders and can make wise decisions for themselves and their livelihoods. In this way, CInI sowed the seeds for sustained progression.

By default, most government schemes and policies today benefit large farmers, isolating small and marginal farmers despite most investors looking at irrigation facilities on land rather than its size. It is necessary to understand that the potential lies with small farmers who possess around 70% of

farmland in our country. It is anticipated that the government, at either the state or the central level, will recognise the criticality of all these contextual interventions and accordingly modify its approaches to suit the needs of tribal farmers based on the same line. The synergies between the government and Civil Society Organisations (CSOs) can amalgamate the physical and financial resources with the area sector expertise and bring relevant positive change to the lives of tribal people and contribute to their development.

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4

ENABLING FARMER ASPIRATIONS THROUGH UNLOCKING IRRIGATION POTENTIAL

Experiences from *Lakhpati Kisan* Initiative

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4.1 Introduction

Farmers are not new to the fact that various risks and uncertainties accompany agriculture. From the point of view of crop productivity, access to robust and innovative irrigation facilities keeps these risks in check to a certain degree. CInI realised the potential of irrigation in making significant gains in the productivity of crops and made it an integral part of achieving the goal of LKP. Irrigation was an enabler that would supplement agriculture and facilitate the adoption of livestock rearing as an alternative livelihood-earning occupation.

The relevance of providing access to irrigation facilities in rural areas can be better understood from the contemporary irrigation situation in the country. About 54% of total agricultural land holdings in India and 73% in central India depended on rainfed irrigation (Ministry of Agriculture). The dependency was much higher in the Scheduled Tribes areas, with the all-India average for rainfall dependency being 78% and 85% in central India levels (Gupta, 2019). In India, as opposed to 170 best-irrigated districts, there were around 112 districts with less than 30% of farm holdings having access to irrigation. Even among the poor-performing districts, tribal communities were the most excluded, as only 10% of tribal farms have irrigation coverage (Shah et al., 2016). Although the project took all the needful marginal and small farm holders under its consideration, an extra effort was made to benefit the tribals in the rural setup. This was necessary because 70% of the tribal population resides in the rainfed central Indian highlands. These farmers lacked a history of mainstream agriculture and possessed small and fragmented land holdings. Although these areas received decent annual

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rainfall, it was erratic and rainy days were decreasing. Also, later arrival and early withdrawal of monsoon with long dry spells in between had become common, which increases risks to livelihoods. Without infrastructural facilities to store the water runoff, the scope of farmers in these areas was largely limited to kharif crops. Due to the lack of supplemental irrigation facilities during the lean period, there was an increasing out-migration as the farmers migrated for work.

There have been continuous attempts to expand the irrigation base in the country since independence. However, the Revitalizing Rainfed Agriculture (RRA) (2019) Network points to the fact that the present Water Policy concerning agriculture lacks the vision to improve the irrigation situation of the rainfed regions. Although the Ministry of Jal Shakti (MoJS) has programmes to tap the potential of irrigation, their components are either not very relevant to the resource management of rainfed regions, as they focus on increasing rainfall use efficiency, or they have become dysfunctional (Revitalizing Rainfed Agriculture, 2019, p. 1). *Pradhan Mantri Krishi Sinchayi Yojana* (PMKSY), a flagship programme of the present government, emphasises expanding the cultivable area under irrigation and improving on-farm water use efficiency. However, the researchers are sceptical about the resource allocation under this programme, and some speculate that the benefits might circumvent the unirrigated half of India's agrarian landscape. Even the supporting World Bank projects like the Neeranchal National Watershed Management Project failed to provide satisfactory performance despite having an integrated approach towards watershed development (Lahiri, 2017).

A common factor in most programmes and policies that failed to achieve the intended goal was the inability to engage with the community in long-term management practices. CInI identified the relative situations of its targeted households living in different clusters and worked towards helping the farmers escape their precarious situation regarding livelihood and sustenance. Agricultural production depended on a short window of rainfall during the monsoon. The uncertainty of kharif crops in irregular monsoons caused uncertainty. This uncertainty could be reduced if critical irrigation was provided at this point. Therefore, CInI strategised to develop irrigation potential in these areas, which can ultimately unlock the livelihood options and income sources and, in turn, bring prosperity to the farmers in dire need. CInI worked with the aspiration to ensure irrigation access in at least 0.30 to 0.50 acres of land per household in both rabi and summer seasons.

In five years, CInI provided and increased irrigation access for thousands of agricultural households (refer to Annexures Table A and B). The key takeaway was, however, ingrained in the five-year journey of the programme, which is demonstrated in the following subsections. This chapter is divided into five sections – Section 4.2 looks at the issue of irrigation in central Indian hinterlands; Section 4.3 focuses on approaches and strategies for unlocking

irrigation potential; Section 4.4 focuses on the key irrigation interventions under the Lakhpati Kisan Initiative; Section 4.5 focuses onthe impacts of irrigation on livelihoods, discussions and challenges, while Section 4.6 deals with summary and conclusion.

4.2 Problems in Programme Areas of CInI

Extending access to irrigation facilities to rural agricultural households is the need of the hour in a country like India, which has a large population of small and marginal farmers practising rainfed agriculture. Without water, both food security and livelihoods stand at risk. However, such ideas need to overcome a set of persistent geographic and socio-economic challenges. CInI had the vision to transform the quality of life of rural communities through innovative ideas and technology. However, before initiating any interventions towards social change, CInI committed itself to identifying and understanding the key problems that these communities in the landscape are facing. In extending irrigation support to rural households, CInI followed a community-centred approach to map out and document the obstacles that needed to be discussed and pondered to make any substantial impact in the region.

4.2.1 Fragile Ecology

The working areas of CInI can be categorised into east (Jharkhand and Odisha) and west (Gujarat and Maharashtra). The rural highlands in all four states share a similar topography endowed with undulating plains, hilly patches, flat tops, steep slopes, and intermontane valleys. While the western geographies receive an annual rainfall of 550–850 mm, the eastern regions receive an annual rainfall of 1,000–1,500 mm. The rainfall is mostly concentrated in the four months of the monsoon season, and though it seems decent, often the right timing and precision of rainfall determine its agricultural returns. Due to the undulating terrain, the rainfall in these areas generally results in excessive runoff and low rainwater infiltration into the soil. The small streams formed during the monsoon often dry up soon after the monsoon is over. Also, the water flow in the seasonal surface bodies lasts until December–February.

The inadequate water availability for irrigation and ineffective water management practices in these areas have resulted in a single cropping season (kharif) that sometimes fails. The absence of assured irrigation takes its toll on crop productivity, resulting in low yields. As a result, agriculture has become non-remunerative for the farmers, which keeps them poor. The targeted families' average household income was less than Rs. 25,000 in Maharashtra and Odisha in 2015–2016.

In the western areas, the uplands and midlands are mostly untreated and experience poor vegetative cover due to deforestation. However, in the eastern regions of Jharkhand, where soil depth is decent, the slopes are gradual as they have been historically developed into terraced paddy fields in midlands and lowlands by the farmers themselves. The terracing of land breaks the speed of runoff and retains water on the soil for a longer duration, allowing groundwater recharge, which ultimately discharges into the lowland areas in streams and rivers. Though abundant in water resources, farmers lack pumping and delivery devices to efficiently lift water from the source and channel it to their fields. In contrast, in Gujarat and Maharashtra, the soil is shallow, inhibiting the terracing of agricultural lands. When crops are cultivated on these hills, ploughing and high-intensity rainfall loosen up the topsoil and ultimately lead to erosion. This is the main reason the soil quality degrades because as more and more topsoil is lost, rocky surfaces are exposed, which are unsuitable for agriculture. The slopes result in rainwater runoff, and the basaltic rocks do not allow much groundwater recharge. Thus, the groundwater is also found at a greater depth. This necessitates the harvesting of rainwater to enhance recharge potential and support supplemental irrigation. Although recharge structures were made, they are few and most of the structures are defunct due to the deposition of silt that comes along with the runoff from uplands. The dearth of such structures directly results from a lack of maintenance, which has increased distress by reducing access to irrigation.

4.2.2 Untreated Uplands

Ever since Independence, government has concentrated on developing dams and canals. These and groundwater extraction infrastructure have significantly increased the area under irrigation over the years. However, a cause of concern is that these benefits have somehow bypassed the rainfed uplands because the Water Policy has always focused on the catchment-dam-canal model. This creates a downstream focus where higher catchment ranges are perceived as runoff-producing areas. Along with water resource development, the rural rainfed villages require soil-moisture and water conservation efforts.

Past government initiatives have tried to address these 'soil and moisture conservation' needs through watershed programmes, the repair, renovation, and restoration (RRR) project for community water bodies, and the soil and water conservation component of the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), but they have not met much success. Furthermore, the government's investment in developing water infrastructure that could harvest rainwater and assist irrigation and groundwater recharge has not yielded the expected positive results due to the heavy

siltation of these structures and the disinterest of community members in carrying out maintenance. Without treatment of uplands, the problem of siltation continues, and without periodic desilting, structures like check dams and farm ponds remain inefficacious.

4.2.3 Unaffordable Energy

With the given problems of surface irrigation, farmers' dependence on groundwater extraction for irrigation was bound to increase, but it disadvantages small and marginal farmers. Their socio-economic conditions made it difficult for them to invest in pumping and lifting devices while allowing big farmers to exploit this common resource. The eastern areas were rich in water sources, but the farmers lacked the mechanism to utilise the resources. Poor road networks limited the public accessibility of the locals. Many small farmers found it difficult to procure good quality diesel to run the diesel-based pump sets. Besides increases in diesel rates, farmers also had to bear additional transportation costs and an opportunity cost in their procurement. To make it more economical, it was a common practice in these regions to mix local oils and kerosene with diesel, which lowered the pump's efficiency and increased maintenance costs.

Another option for farmers was to use electricity to pump water. Many villages were found to lack the three-phase electricity connection necessary for pumping water. On the other hand, the villages that had three-phase electricity connections faced frequent power outages and low voltage with heavy fluctuations. In rural villages of Jharkhand and Odisha, 90% of farmers depended on diesel-based pump sets as installing electric pumps was expensive and inconvenient due to voltage problems. In this context, *Jyotigram Yojana* was a superb government programme in Gujarat to provide rural areas with a 24-hour, uninterrupted, 3-phase quality power supply. However, the long waiting period for application approval demotivated many farmers from acquiring an energy connection, as it may take up to six months or sometimes even more than a year. Recently, PM-KUSUM was launched by the Government of India, which could assist individual farmers in installing standalone solar pumps to extract groundwater with a capacity of up to 7.5 HP with 60% subsidy support. However, farmers lacked the know-how and did not have the confidence to invest in this kind of technology. They required awareness and mobilisation to invest in the newer technology because, even after the subsidy, the entry cost for individual farmers was high.

4.2.4 Technology Percolation and Institutional Support/Financial Support

Lower technology percolation/adoption in rural regions of India was a continuing problem that inhibited small and marginal farmers from reaching

the full potential of irrigation and, thus, agriculture. Multiple factors on the demand and supply sides of agricultural inputs continued to escalate the problems. On the supply side, the traders did not see the remote rural landscapes as potential markets for the sale of farm outputs. At the same time, the high cost of farm inputs, followed by the inability to access technology and parcels of land (fragmented lands), and ineligibility to avail of subsidies made farmers reluctant to adopt newer technology. They are hesitant and risk-averse when it comes to irrigation facilities due to uncertain benefits.

The government had multiple irrigation-related schemes for farmers, including PMKSY, PDMC, and PM-KUSUM. However, they benefitted small and marginal farmers (SMF) less as most were designed for big farmers. Also, the timely leverage of these schemes was no longer a concern but an actual problem. After the farmer applied, there was a long procedure associated with a technical feasibility survey and verification for eligibility. The application could be rejected because of issues with land titles; the farmer could not claim the subsidy. A limited number of entries were sanctioned to avail of subsidies in a season. These factors prevented farmers living in remote areas from benefitting, but it was easier for the villages near the Mandal or district headquarters to do so. Sometimes, duplication of applications occurred when farmers availed themselves of subsidies in the name of another farmer without his/her knowledge. Thus, when the land's original owner applied for the same scheme, his/her name showed up as an existing beneficiary, and their application was rejected. The long waiting period, excess paperwork associated with availing of a scheme, and rejection of applications due to issues with land title transfers demotivated farmers from applying for government schemes and subsidies.

There was also a dearth of knowledge and a prevalence of myths about the technology's user-friendliness, operation, and management. The hinterland farmers were detached from techno-savvy societies and remained unaware of the technologies they could adopt to improve agricultural productivity. Micro-irrigation was one of them. Under the "Per Drop More Crop" (PDMC) component of the government's PMKSY, small and marginal farmers received a 55% subsidy on installing drip irrigation per acre of land. However, this model was unsuccessful in rural areas as farmers were sceptical about user-friendliness, operation, and management. Even if a farmer dodged all the bullets and installed the system, it was fruitful only if the farmer produced and sold a high-value crop. This opened a Pandora's box of problems and opportunities as poor market linkages for farm output continue to make farmers vulnerable despite increasing their production. They also had doubts about whom they would approach if such costly devices malfunctioned, as they had no shops or markets nearby. Farmers could not visualise commercial output and benefits from their small land holdings. Therefore, there was a very low demand for micro-irrigation devices in the

villages, and external donors and vendors were also not interested in extending support as they did not see a potential market in these villages.

In its early planning stages, CInI recognised and acknowledged the challenges faced by farmers, emphasising a holistic approach to boost their annual income. While Chapter 3 extensively discusses strategies to address market linkages, this chapter focuses on the concerted efforts to ensure reliable irrigation for small and marginal farmers. The journey towards providing guaranteed irrigation, particularly in remote areas, is fraught with ecological, social, political, and technological challenges. The following section illustrates CInI's approach to overcoming these obstacles and paving the way to fulfil every farmer's aspiration: access to water for irrigation.

4.3 Approaches

CInI's primary aim was to design effective interventions that can develop the existing natural water resources potential to a considerable level in the working areas and thus increase access to irrigation at the household level. To ensure the smooth functioning of the Water Resource Development (WRD) as well as soil and moisture conservation (SMC) exercises, the CInI team followed a community-based approach to make certain that village community members participated in every step of irrigation-related activities right from planning to post-implementation monitoring so that they develop a sense of ownership towards the created structures and understand it as their responsibility to maintain and prolong their usage.

Hence, CInI established water user groups (WUGs), comprising direct beneficiaries of irrigation structures developed through the planned Water Resource Development (WRD). CInI focused on low-hanging fruit and prioritised areas where water resources were already present but lacked pumping and delivery mechanisms to utilise this water for irrigation. They installed pumping and delivery mechanisms to utilise the available water for irrigation. Where the resources weren't available, CInI created artificial groundwater recharge structures and installed lift irrigation systems (LIs). In close consultation and with the active participation of the WUGs, CInI ensured the conservation measures by identifying the recharge area of village/terrains and constructing various recharge structures like ponds, earthen check dams, bunding of lands, etc., whichever befitted the given geography and situations. Convergence was achieved with various government schemes, such as MGNREGA/PMKSY, to increase water resource availability.

The WUG members were taken for exposure visits to sites with intensive agricultural practices where water resources have been created in collaboration with CBOs so that they can comprehend the concept of crop planning and the roles and responsibilities of a WUG member. Recognising and realising the issues of specific areas, CInI introduced different technologies

in the village areas. Where a lack of electricity connections hindered the extraction of groundwater for irrigation, if feasible, CInI brought in a group solar lift irrigation system to install an uninterrupted but regulated water supply system in the area. By establishing group/community structures, CInI established a command-and-control system that acted as a check against overuse or exploitation. By adopting the Community-Based Irrigation Water Management (CBIWM) approach, CInI involved the community in managing irrigation water usage to ensure that permanent damage, depletion, and degradation are reduced automatically. To improve crop productivity and promote water use efficiency in high-value vegetable crops, CInI introduced a drip irrigation system in several areas, customised according to the farmer's landholding size.

Before handing over the irrigation structure to the community members, CInI provided detailed training to the WUG farmers to motivate them to use new technologies efficiently with optimum water utilisation. They were trained in water budgeting, water management, and crop planning exercises. They were also trained to carry out repair and maintenance work necessary before the onset of the monsoon season every year to ensure the proper functioning of the irrigation structures to their full capacity.

CInI approached the problem of market linkages by incorporating the market-led intervention in their programme design, forming FPOs led solely by women across different production clusters that worked in procuring input supplies and generating output markets for the farmers' produce. Though initially not in the plan, CInI realised the need to focus on improved water use technologies, incentivising efficient water use, and thus encouraged community members to go for artificial recharge wherever necessary so that groundwater extraction and recharge were managed sustainably. This would allow the aquifers to provide base flows to the surface system and maintain ecology. Thus, CInI promoted sustainable irrigation practices, efficient water technologies, and behavioural change activities around water use to enhance crop and water productivity and expand cropping areas. To saturate the irrigation potential of the area, CInI has been making efforts towards enhancing community sharing, raising funding proposals from other sources (government and like-minded donors), and rolling out affordable credit models.

4.4 Key Interventions by CInI

Agriculture being the primary livelihood activity of the central Indian highlands, fulfilling the *Lakhpati Kisan* goal necessitated access to year-round irrigation that could stabilise the kharif crop and support the rabi crop, providing additional income to the farmers. Access to irrigation could improve productivity and returns from the major cereal crops and also enable a shift

towards high-value crops. However, this made it necessary to create irrigation. CInI's idea to expand irrigation coverage in identified areas was to (i) mobilise village community members to collectively understand farmers' needs and make them a part of the intervention activities, (ii) enhance the supply side of irrigation to expand and improve the area under reliable irrigation, (iii) moderate the demand side of irrigation by improving water use efficiency, and (iv) create an ecosystem of positive perception towards technology and stabilise institutions to ensure the sustainability of interventions. The idea was to create community assets for the farmers instead of doing interventions in silos.

4.4.1 Community Mobilisation

CInI realised that for any intervention to be successful and sustainable in the long run, it was essential to ensure community participation at all stages. Thus, the planning for water resource development was carried out with the apex village community institution functioning. The concept for WRD was first shared in the Village Institution (VI)/Village Organisation (VO) meeting and then was discussed with the people at the hamlet level. This helped CInI understand the potential interventions in the village according to the given geography and situation. Accordingly, WUGs were formed, which comprised farmers who were the direct beneficiaries (see Table 4.1). The WUG members participated in all stages of interventions starting from identifying sites, finalising the intervention, planning the budget, procuring material, negotiating with vendors, arranging labour, developing structures, utilisation of structures, collection of user fees, repair and maintenance, and monitoring.

4.4.2 Interventions to Enhance the Supply Side of the Irrigation

In the next stage, CInI developed the following interventions that could augment the water supply and bring more area under irrigation (Table 4.2).

4.4.2.1 Reviving Defunct Water Resources Wherever Possible

Where irrigation infrastructure was absent, there was a need for WRD to create new water structures. CInI carried out resource mapping and transect

TABLE 4.1 State-Wise Number of SHGs, VOs, and CLFs Created

State	*No. of SHGs*	*No. of VOs*
Gujarat	3,322	47
Jharkhand	2,651	295
Maharashtra	863	80
Odisha	789	62

TABLE 4.2 Year-by-Year Gross Area under Irrigation (Acre)

State	*2015–2016*	*2016–2017*	*2017–2018*	*2018–2019*	*2019–2020*	*2020–2021*
Gujarat	15,200.31	41,010.86	74,131.85	6,7746.2	63,221.06	62,697.76
Jharkhand	2,124.46	2,277.09	4,514.13	6,269.44	5,469.55	1,768.44
Maharashtra	2,979.47	7,460.5	9,026.55	9,146.5	12,301.63	12,313.26
Odisha	68.58	103.9	145.65	204.77	169.9	89.61

walks with community members, where potential locations were identified for developing water recharge structures and the command area they would cover. Based on this preliminary field survey, the region's watershed, community consultations, and recommendations from technical experts, low-cost affordable water structures were created with contributions from the beneficiaries. These structures were adapted to local needs and mostly tapped water from the live streams or rivulets (Refer to Annexture Table C for more details). These water infrastructures included gabion walls or check dams, dug wells, shallow wells, ponds, and divergent-based irrigation (DBI) systems. The area under irrigation and the households benefitting from this increased over the years in some cases (Tables 4.2, 4.3, and 4.4).

In the villages of Jharkhand and Orissa, the wells and ponds were mostly dug in lowland seepage areas or near riverbanks as they served as the discharge zone for the stream water and supported rapid well-recharge. These shallow ponds were of value to the farmers as groundwater was found at a depth of only 10 feet. The wells and ponds were created in lowland regions, and water was lifted to the farmlands from these sources.

Gabion structures were low-cost, high-impact structures in Gujarat and Maharashtra with steep slopes. They slowed the runoff and erosion to some extent and stored water for some time while allowing groundwater to recharge. Similarly, check dams store water from seasonal streams and also check the high runoff during monsoon due to their design that slows down the high speed of running water. In many places, CInI linked check dams with wells to aid well recharge.

Both the gabion walls and check dams suffered from siltation. However, when the water receded, the land between the two gabion structures could be used for cultivating crops as they had rich, fertile silt deposits. To maintain functionality, the check dams required more maintenance and an elaborate desiltation process. Group wells were also created in the western areas near live streams so that well recharge took place simultaneously. Small water harvesting structures were created in areas with small streams, and the water was distributed to groups of three to five farmers under a micro-lift irrigation system. Village water tanks were created using MGNREGS funds.

Few DBI systems were constructed in Maharashtra and Jharkhand in areas with high elevation with live streams throughout the year. DBIs were based on high pressure, gravity-guided flow of stream water, which was diverted to fields using closed polyvinyl chloride (PVC) pipes in contrast to traditional *pat* systems, which had open diversion canals. The PVC pipe prevented water loss due to siltation, lateral spillage, groundwater absorption, evaporation, etc., as in the earlier system. It provided high irrigation efficiency and water supply to more farmers at low cost and maintenance.

TABLE 4.3 Total Households Benefitting from Irrigation

State	*2015–2016*	*2016–2017*	*2017–2018*	*2018–2019*	*2019–2020*	*2020–2021*
Gujarat	13,531	30,694	46,562	46,845	46,359	46,592
Jharkhand	6,087	9,141	14,744	17,359	16,951	11,653
Maharashtra	4,129	7,214	9,506	9,771	12,232	12,825
Odisha	710	789	802	1,095	832	461

TABLE 4.4 Average Irrigated Area for Each Household (Acre per HH)

State	*2015–2016*	*2016–2017*	*2017–2018*	*2018–2019*	*2019–2020*	*2020–2021*
Gujarat	1.12	1.34	1.59	1.45	1.36	1.35
Jharkhand	0.35	0.25	0.31	0.36	0.32	0.15
Maharashtra	0.72	1.03	0.95	0.94	1.01	0.96
Odisha	0.10	0.13	0.18	0.19	0.20	0.19

After the structure was finalised, its command area for different farmers in the User Group was demarcated on a map. Following the site survey, a detailed site-specific implementation plan and costing and command area utilisation plan were made and approved by CInI with the sub-cluster coordinator and village institutions. WUG members were taken for exposure visits to sites where similar interventions had been done and managed by CBO members. The village institution issued a letter to CInI and other funding agencies requesting financial support, following which quotations were invited for various machines and materials required to develop water structures, and the vendor was verified, finalised, and approved by the VI, WUG, and purchase committee. In the implementation phase, regular management, monitoring, and field supervision were carried out by technical persons and the WUG to ensure all the activities were going as planned and the quality was up to the mark. WUG members made timely payments, and the VI was ensured, and they also secured community contributions. A completion certificate was issued when the structure was built, and external experts reviewed the entire programme.

4.4.2.3 Providing Pumping and Delivery Mechanisms to Beneficiaries

CInI identified the gaps that inhibited lifting water from existing water infrastructures and focused on providing water pumping and delivery mechanisms from the source to the farmer's field. In areas where farmers lacked pumping devices, they were provided with community assets in the form of diesel-based, electricity-driven, or solar-powered pump sets according to the best-suited alternative in the particular location and situation. If the farmer possessed the power to pump water but lacked a delivery device, the LI system was mobilised by forming LI cooperatives and User Groups and installing pipelines that could transport water to the field. The LIs were connected to different water sources such as check dams, wells, and bore wells. Recharge structures were also created near the wells to replace the water extracted during irrigation. Solar-based LIs were installed in groups of five to ten beneficiaries based on the area and water source.

4.4.3 Interventions to the Moderate Demand Side of Irrigation

The demand side of irrigation water management focuses on improving water use efficiency in agriculture and reducing water demand by adopting different irrigation technologies and practices. Besides water service provision through water harvesting and aquifer recharge, CInI emphasised water demand management by optimising water use through efficient irrigation technologies and practices. These included bundling agricultural fields, mulching, alternate furrow irrigation, and adopting drip-irrigation

systems. The principle behind these soil moisture conservation techniques was essential to minimise water wastage, reduce soil erosion and water loss through run-off or evaporation, and improve rainwater infiltration into the soil profile.

Bunding was encouraged across the agricultural field as it seized rainwater on the ground and allowed it to infiltrate the soil. It arrested soil erosion and conserved soil moisture in the field, which would help ensure crop survival even during dry spells. CInI promoted using plastic sheet mulching among farmers as it covered the bare soil surface and protected it from crusting by high-intensity raindrop impact. Thus, it enhanced water infiltration and reduced runoff and accompanying soil erosion. Soil cover also prevented water loss from the soil through evaporation, protected the soil from the extreme heating effect of the sun, and regulated its temperature. It also minimised the growth of weeds around the main crops, which use crops' nutrition for their growth. Drip irrigation, the most efficient way of delivering water and nutrients directly and locally to the crop's root zone, could reduce water demand for irrigation by up to 50% (Narayanmoorty, 2016), resulting in high water and crop productivity. Strategically, demand for drip irrigation was created among farmers, which enabled a shift towards vegetable cultivation and improved crop productivity and return to the farmer. Table 4.4 shows the progress in the drip and mulch system installed in CInI's working geographies of Gujarat and Odisha from 2015–2016 to 2020–2021 (Table 4.5).

The major emphasis of CInI was leveraging government schemes wherever possible by creating synergy between government programmes and agricultural livelihoods. The upland treatment was carried out under watershed-related soil and moisture conservation work by dovetailing MGNREGS, National Bank for Agriculture and Rural Development (NABARD) watershed, and other donor funds. In private uplands, the contour trench on non-arable ridge areas, fodder grasses on wastelands, loose boulder gully plugs on stream drainage lines, wasteland treatment, and plantations were all carried out under the umbrella of the watershed approach of NABARD. Even some of the farm bunds were created under government programmes. Since some of the uplands were under the administration of the forest department, it became highly difficult to carry out interventions in those areas as the forest department rarely grants permission for the same. Therefore, upland treatment could only be undertaken in very few areas. Wherever irrigation could be extended, efforts were made to convert uplands into more economic entities by initiating orchard establishment in wastelands. Table 4.5 shows some soil moisture conservation works and watershed activities undertaken in Gujarat and Maharashtra programme areas during five years of CInI's work.

TABLE 4.5 The Average Gross Area under Drip Irrigation (Acre)

State	*2015–2016*	*2016–2017*	*2017–2018*	*2018–2019*	*2019–2020*	*2020–2021*
Gujarat	-	-	-	-	0.27	0.21
Jharkhand	-	-	0.04	0.16	0.19	0.20
Maharashtra	-	-	-	0.45	0.69	0.62
Odisha	-	-	0.28	0.36	0.25	0.30

4.4.4 Supporting and Sustainability-Based Interventions

Before LKP, technology adoption was rare in the villages due to the high equipment installation cost and lack of know-how. As discussed in Section 4.2, there were issues such as uneconomical landholding sizes, problems in availing of government subsidies, troubles with land title transfers, poor market linkages, etc.

CInI overcame the challenge and created an ecosystem conducive to adopting innovations and technological solutions. Through dialogues, demonstrations, and exposure visits to the villages where the farmers are already reaping the benefits of the technology, capacity building, and training exercises, CInI created a shift in the perspective and mindset of the farmers and made them realise the potential of technology in improving the yields and income. Thus, it created a demand among the farmers for different technical solutions suitable for irrigation in their particular area to earn the desired income. The demand creation and knowledge facilitation also bridged the gap between farmers and the government schemes, NGOs, donors, and private players.

Along with this, enhancing markets by linking the farmers with vendors gave them confidence as they were assured that they would have a place to sell their produce. CInI established market linkages by creating production clusters and connecting farmers to vendors in wholesale *mandis* and corporate buyers through traders, LI federations, and farmer producer companies (FPCs). They were also connected with vendors whom farmers could approach in case of any issues regarding the operation and maintenance of the devices.

Based on the availability of water in a particular season, farmers were trained to carry out water budget and crop planning exercises so that before the sowing season, the members of a particular water group could discuss among themselves and plan out their actions beforehand. For farmers who could not carry out the weekly harvest of vegetable crops due to labour shortages, transport difficulties, or any other reasons, shifts were made towards onions and potatoes that require a one-time harvest and facilitate farmers as per their choice. Farmers were helped in different ways to find solutions for their problems and provide answers to their "*what ifs*" and "*buts*".

This ecosystem creation strategically and sequentially resolved farmers' dilemmas and enabled them to take investment risks. Some of these government schemes were leveraged and executed across clusters by CInI and the farmers. Seeing the farmers' benefits, many more were in the planning stage, such as solar-based pump sets promoted under CInI's SustainPlus programme.

4.4.4.1 Drip Irrigation Support

To reduce costs and facilitate the drip application process, different settings were laid down by CInI according to the state provisions. In Gujarat, drip was installed in farmers' fields through collaboration with Gujarat Green Revolution Company Limited (GGRC), the government's special purpose vehicle for the implementation of a micro-irrigation scheme in the state, which offered a subsidy per hectare of 70% to 80% for small and marginal farmers and a subsidy of 85% to 90% for the tribal farmers. Farmers bore the rest of the cost as an upfront contribution.

In Maharashtra, government norms required farmers to spend their own money, which would be later reimbursed by the government as subsidy payments in their bank accounts. The high cost of the drip irrigation system made it impossible for poor farmers to even think about the technology as they lacked the working capital to buy high-quality drip devices, and banks also hesitated in providing loans to the farmers. The subsidy payments were seldom on time. Keeping all the limitations of government models in mind, CInI, along with its funding partners, designed a prototype suitable for small and marginal farmers so they could access drip irrigation technology: an 80% subsidy was offered to SMFs as grant support from partner NGOs, and 20% of the cost was to be borne by the farmers. The funders capped the subsidy support at Rs. 66,000/acre (USD 888.46/acre) of land. The problem with delays in subsidy payments by the government was eliminated, and the process became more efficient through the introduction of digitisation of applications and records. This facilitation generated a flair among farmers towards drip technology and subsequently led to its enhanced adoption.

In Jharkhand, drip irrigation was stimulated both with support from the government and private donors. Both stakeholders offered an 85% subsidy, while the rest of the cost was to be paid as the farmer's contribution. CinI assisted the process by connecting farmers with the government through a tie-up with companies that mediated the entire process. The company would forward the application and farmer's demand to the government and facilitate the entire process of application, payments, and installation. This reduced the farmer's workload and made it convenient for them to access the technology.

In all, CInI bridged the gaps inhibiting the farmers from benefitting from the government's programme. The government programme on micro-irrigation is essentially designed to provide irrigation in a minimum of 1 hectare of land. For small landholdings, the scheme was not viable. Therefore, CinI made efforts to customise the drip system according to the farmer's need for land and made it possible to provide subsidies even on half or one acre.

4.4.4.2 Solar-Powered Irrigation

As mentioned earlier, irrigation was carried out in rural areas mostly through diesel-based pump sets, which suffered from high fuel costs and poor efficiency. In areas where grid connection was available, the power supply was irregular, mostly supplied during nighttime and affected by low voltage fluctuations. Often, farmers turned on the switch for irrigation and left it on till morning, resulting in extensive flood irrigation and wastage of water, all due to erratic power supply. Introducing solar-driven pump sets for irrigation as a standalone model worked in many of these villages, lowering the operating cost for diesel-based pump sets and allowing farmers to irrigate their fields in daylight without water wastage.

In the initial years of LKP, CinI installed two solar-driven pump sets in Dahod, Gujarat, through NABARD and some contributions from private grants and TATA Trusts. But, earlier, the progress of the intervention was relatively slow due to the high cost of installing solar-based lift irrigation systems. In recent years, as the costs have come down and with the support under the PM-KUSUM programme, many such solar panel systems were installed by farmers where they provided space. Table 4.6 shows the progress of solar-based Lis installed with different irrigation sources (well/bore well/river) across four of CinI's programme area states from 2016–2017 to 2020–2021.

Based on the results and experiences of solar-powered pump sets, SustainPlus, a clean and green energy programme, was introduced in LKP in 2018–2019. Under this, CInI has introduced loan-based models whereby a solar panel system was installed among a few farmers with a 70% grant, 20% loan, and 10% farmer's upfront contribution. This 20% loan was taken on credit from an irrigation federation created by CInI as an apex institution in the cluster. The loan amount varied from Rs. 80,000 (USD 1,076.92) to Rs. 160,000 (USD 2,153.84), and the repayment period was around 30 months. This facilitated loans in monthly instalments without burdening farmers. Above all, this created an atmosphere in which farmers started investing in infrastructure as they saw its benefits.

4.4.4.3 Sustainability-Based Interventions

To increase the sustainability and effective management of irrigation infrastructure and distribution of water, CInI ensured that most of the interventions were carried out in a community group. The farmers were involved in all stages of planning, implementation, and monitoring. They were made to contribute to the intervention either in kind or cash to develop a sense of ownership and responsibility towards the water structure and its management. It also ensured the smooth running of the irrigation system

TABLE 4.6 Solar Pumps Installed

State	*2015–2016*	*2016–2017*	*2017–2018*	*2018–2019*	*2019–2020*	*2020–2021*
Gujarat	-	-	-	-	-	45
Jharkhand	-	-	-	-	142	125
Maharashtra	-	-	-	-	-	-
Odisha	-	-	-	-	-	8

Source: Author's compilation.

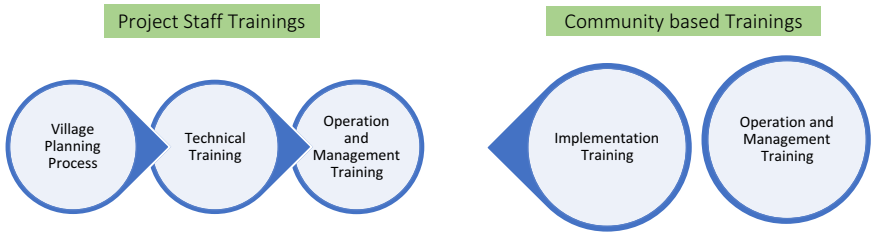

FIGURE 4.1 Capacity Building Training Exercises for CInI's Project Staff and Community Members.

Source: Author's Compilation.

as farmers distributed different duties among themselves and contributed a fixed amount every season as irrigation fee recovery, which was utilised to maintain the structures, pump sets, and other devices. They were also trained to carry out repair and maintenance work necessary before the onset of the monsoon season every year to ensure the proper functioning of the irrigation structures to their full capacity (Figure 4.1). After a few years, CInI also started rolling out credit-based loan models to reduce the sole dependency on grants, and farmers initiated loaning from community-based institutions based on pre-fixed easy monthly instalments.

CInI emphasised behavioural change in the farmer communities to increase water productivity, promote water conservation, ensure effective utilisation of water, and minimise wastage. In the areas where flood irrigation practices were prevalent, CInI encouraged the use of drip or sprinkler systems. To ensure soil and water conservation, CInI strengthened water resources by creating recharge structures and also stimulated upland treatment wherever necessary and feasible. It focused on increasing the water productivity of crops and made farmers aware of the means to achieve this. It tried to instil a sense of responsibility among farmers while extracting groundwater for irrigation, so demand did not exceed supply.

4.5 Impacts of the Programme

The interventions under LKP by CInI showed considerable results in almost all 17 clusters in 5 years. The overall irrigation coverage increased by 19557.77 to 81,162.14 acres, benefitting more than 29,968 households across all 4 states (Table 4.7). This has, in turn, helped increase the farmers' income as the smallholder cultivators move towards intensive farming and high-value crops.

TABLE 4.7 Water User Groups across Intervening States

State	*2015–2016*	*2016–2017*	*2017–2018*	*2018–2019*	*2019–2020*	*2020–2021*	*Total*
Gujarat	0	82	15	68	35	10	210
Jharkhand	38	164	18	59	20	39	338
Maharashtra	74	207	40	58	97	105	581
Odisha	55	62	55	34	10	0	216
Total	167	515	128	219	162	154	1345

Source: Author's compilation.

4.5.1 Expansion in the Irrigation Command Area

Through its various innovations and interventions, CInI doubled farmers' incomes and improved the overall livelihoods of a targeted group of farmers. The immediate impact of CInI's efforts resulted in expanding the irrigation command area in the villages. The source strengthening and increased access to irrigation increased cropping intensity as 70–80% of the new command area was brought under irrigation. By renovating and reviving existing water sources and creating new ones, the water required for farming became available more easily. The deepening of ponds and conservation measures positively impacted the area's groundwater table as they harvested more rainwater and consequently recharged the groundwater, thus balancing water extraction and recharge.

4.5.2 Crop and Livelihood Diversification and Income Enhancement

With a more efficient pumping and delivery mechanism, water reached from source to fields during the most critical periods. This stabilised kharif crops and enabled farmers to take up winter crops. The water supply at the right time and the introduction of drip and mulching technologies led to crop diversification. The farmers shifted to cultivating high-value crops such as vegetables, which earned them better prices and ultimately improved their earnings.

While carrying out SMC activities, the orchard cultivation in wastelands led to the conservation of topsoil and reduction in runoff, while making the uplands more economical, leading to enhanced income. Earlier, the second crop sown in the kharif season using the residual moisture in the soil benefitted farmers only in the form of fodder. However, now, with access to irrigation, farmers could obtain bumper crops with fodder and grain. Thus, with the extra income earned and in the presence of water and healthy green fodder, farmers got a golden opportunity to invest in livestock, thus diversifying livelihoods and reducing risks.

When the figures of year-wise increase in income are seen concerning the overall increase in access to irrigation, the correlation between irrigation and income becomes clearer. The major impact areas due to the interventions in the irrigation prototype were an increase in cropping intensity, diversifying to high-value crops, and the adoption of livestock rearing as a livelihood option. This led to an increase in the farmers' income as the average annual income of the farmers increased across all the partner states. In Gujarat, the average annual household income from agriculture nearly doubled from Rs. 73,974 (USD 997) in 2015 to Rs. 141,204 (USD 1,904) in 2019. In Maharashtra, the average annual income of SMF households soared from Rs. 36,528 (USD 492) to Rs. 112,342 (USD 1,515) in five years. Likewise, Odisha experienced a 300% increase in income. In Jharkhand, the average annual household income from agriculture increased by 31% (Figure 4.2).

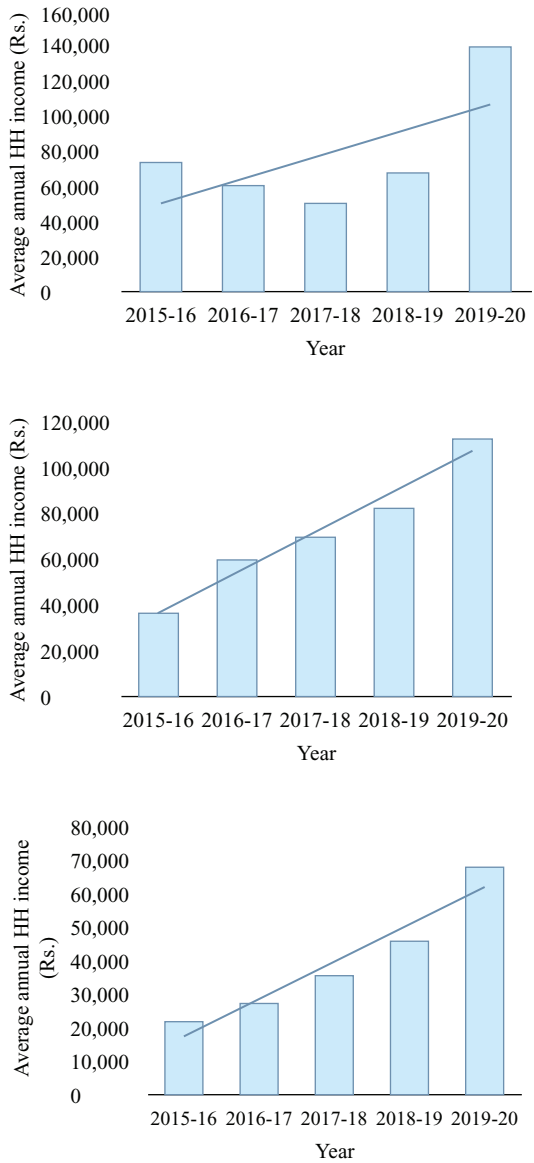

FIGURE 4.2 Average Annual Income of Farmers from Crop Cultivation in Five Years of CInI's Programme from 2015–2016 to 2019–2020.

Source: Author's Compilation.

The increase in income was reflective of the infrastructural work carried out by CInI, which involved creating several new water structures with the participation of communities. The impacts of interventions and innovations in irrigation can be seen from the success story of Pada Village in Gujarat (Box 4.1) and Kherwa Village in Jharkhand (Box 4.2).

Box 4.1 Success Story of Pada Village in Gujarat

Pada Village is a remote village in the Dahod district of Gujarat with dry deciduous forests on hilly terrain intersected with cultivable rainfed farms. Water scarcity forced farmers to migrate to nearby towns for labour. It has already been mentioned that Gujarat receives relatively less rainfall, and the groundwater recharge is insufficient to support assured irrigation for rabi crops. However, the team of CInI visited and explored the opportunities that could be tapped to realise the irrigation potential of the village. Upon conducting a survey, a mini check dam was constructed, followed by the construction of irrigation wells downstream. The team then introduced solar pumps to irrigate the households' farms in the elevated region. As a result, the smallholders who were mostly cultivating maize and chickpea in kharif and rabi seasons have now started to cultivate more profitable vegetable crops like chilli, tomato, brinjal, beans, bitter gourd, and soft gourd.

Source: CInI-STTGDC, 2020.

Box 4.2 Success Story of Kherwa Village, Deoghar District in Jharkhand

Lalita Tudu's family had 20 bighas of land, of which only 5-6 bighas were cultivated during the kharif season. They could not even think of the rabi crop as there was no water. CInI and its partner NEEDS facilitated the construction of four seepage wells and one seepage pond and initiated drip irrigation with mulching, with support from Infosys Foundation, which changed the face of agriculture in the village. Lalita Tudu's family owns one seepage well and one seepage pond. She has also started drip irrigation with mulching, which has totally changed her household economy. At present, Lalita Tudu cultivates around 25 bighas of land (5 bigha on lease) throughout the year. Vegetable cultivation is in around 8–10 bighas of land, of which around 2.5–3 bighas are cultivated through drip and mulch, which has proved exceptionally profitable. The pond has fish all through the year. She has constructed a polyhouse for additional income. Of the total cost of Rs. 316,985, her contribution is Rs. 150,000, of which Rs. 120,000 is a loan from Rang De and Rs. 30,000 was an

upfront cash contribution. The HH income for the family has increased from Rs. 70,000 in 2015–2016 to Rs. 300,000 in 2018–19.

"We buy nothing from market. We grow rice, dal, mustard, vegetables and get all vegetables from the garden and fish from pond. We get milk from the cows we bought with our profit, and have quite a few goats and chicken, bought a two-wheeler and a tractor. We have rebuilt our house and I have also bought some gold jewellery," smiles Lalita, sitting in a courtyard full of drying Arhar and paddy.

Source: Drip Drop Report (2020).

4.5.3 Adoption of Technology in the Remote Villages

Another key impact of the programme was the spread of micro-irrigation structures to remote villages. Although the Government of India had promoted micro-irrigation since the start of this century through various schemes like the Centrally Sponsored Scheme on Micro Irrigation (CSS) in 2006 and the National Mission on Micro Irrigation (NMMI) from 2010 to 2014, the results were poor. CInI helped bridge the gap between government schemes and subsidies offered by governments and the small landholders in tribal villages. It not only helped create awareness about the advantages of micro-irrigation but also helped the farmers avail themselves of government subsidies upon registering for structures related to drip/sprinkler irrigation. Introducing solar pumps was another helpful technological input for the farmers as their operational cost was lower than the diesel or electric pumps, and the efficiency was quite high. The introduction of solar-powered irrigation ensured farmers had an easy irrigation facility in daylight and reduced unnecessary flood irrigation and wastage of water. Solar and drip technology had a high initial capital cost, but their operational costs were lower. Grants and loans facilitated by CInI and other government and private donors enabled the farmers and entrepreneurs to invest their time and money in these productive technologies in the central Indian landscapes. Furthermore, micro-irrigation helped to increase the water productivity of the region. The CInI team maximised crop yields for the available water in the region and spread awareness to the farmers.

It is important to understand that assurance of water for crops has a multi-dimensional impact on the farmer's life and decision-making. It gives farmers confidence to invest in new ventures with an optimistic outlook. Enhanced irrigation helps households to invest more in agriculture, i.e., better-quality inputs, farm mechanisation, and embracing technology to accrue the full benefits of irrigation.

4.5.4 Overall Improvement in Quality of Life

Apart from these direct impacts, assured irrigation paved the way for long-term positive impacts on the lives of rural households. Many farmers in Gujarat and Maharashtra (livestock is in all four states), after gaining assurance in cultivation due to access to irrigation, started to actively invest in livestock prototypes such as small ruminants, piggery, dairy, and fishing. Many farmers growing vegetables had to cut grass, which became fodder for goats that they reared for meat. There was a series of events that were never planned in such a way but fitted quite well, and the result was not limited to an improvement in yield but extended to an overall improvement in the farmers' quality of life. The forced migration in search of labour in nearby cities saw a decline, and the households were able to invest more in their children's education.

4.5.5 Enhanced Skills and Capacity of Community Members

Installing small lift irrigation units and mini check dams was a game-changer for many smallholder farmers in rainfed rural areas. However, structural changes were not the only thing that motivated and helped the farmers. Rather, it was a simultaneous effort on capacity building of community coordinators and service providers that enabled the farmers to trust and adopt the structural interventions proposed by the CInI team. The involvement of village community institutions at different planning and implementation stages facilitated progress monitoring and helped WUGs and CInI manage conflicts related to assets and funds. Not to mention that weekly meetings of WUGs proved efficient in water distribution. As discussed earlier, WUGs charged their members for the operational costs of the structures and created a maintenance fund. This payment helped the community self-regulate the irrigation-related operations and slowly decreased grant dependency. As of 2021, CInI promoted 1,345 water user groups across four states, indicating its commitment to mobilising the community to write its script for management (Table 4.7).

4.5.6 Rolling out Affordable Credit Models

Rolling out credit models for entrepreneurs and among user groups had advantages other than providing much-needed financial assistance. Credit repayment was an important indicator of the progress of the farmers and community. Most of the entrepreneurs were promoted under specifically planned credit models. CInI worked with 558 enthusiastic entrepreneurs, of which around 3 water entrepreneurs invested in irrigation infrastructure and earned by supplying water to the farmers. The ability to repay

loans helped the CInI team understand whether the farmers could get the intended benefits from the interventions and simultaneously decreased farmers' dependency on grants. This achievement was significant as it ensured the community could become capable of managing its assets and resources without help from any organisation after a certain point in time. In other words, it created a permanent development for the farmers and paved the way for a successful exit by the CInI team.

As mentioned above, assured irrigation had a multidimensional impact on farmers as it increased the capability of farmers to invest in new ventures and technologies for better qualitative and quantitative results. The accumulation of income, profits, assets, a strong community, and a decline in extrinsic dependency in the five-year-long expedition opened up a path towards irreversibility, which was the foundation of CInI's project. Box 4.3 further provides us with a glimpse of the impact of irrigation on the lives of people in the villages of Jharkhand.

Box 4.3 Impact of CInI's Efforts on the Village Kalipuranga, Dumka District, Jharkhand

In the village of Kalipuranga, located in the Dumka district, members from almost all 95 HHs migrated to Bihar or Bengal to work as wage labourers and earn income to sustain their families. There was very little earning from the agricultural land where only the kharif crop could be grown because of water scarcity. The river Tepra flowed close to the village, but there was no means to irrigate the land as it was impossible to lift water from the river. CInI and its local partner organisation PRAVAH facilitated the formation of the SHGs in the village. After a discussion with the villagers, a proposal was finalised for installing a lift irrigation system supported by the Infosys Foundation, which could help irrigate the fields at the bank of the river. The condition was that they should contribute 10% of the total cost. The villagers saw an opportunity, and 66 households agreed. Today, 66 households grow several crops throughout the year. The high-value chilli crop brings in Rs. 4,000 to Rs. 5,000 monthly. Migration has stopped in all 66 HHs. The LI has ensured enough income for these households to stay with their families.

Source: Drip Drop (2020).

4.6 Discussions: Integrating the Experiences from Irrigation-Based Interventions

The five-year-long journey of LKP witnessed many success stories and some setbacks. However, access to irrigation played a role in such stories. Even

though a direct income gain from irrigation facilities could not be shown, the role of irrigation as an enabler was undeniable. The current agrarian situation demands stakeholders make a conscious shift towards better water management and governance to provide cost-effective and equitable access to irrigation (Shah et al., 2021). Access to irrigation helped the marginalised smallholder tribal farmers increase the productivity of crops and gave them the confidence to invest in high-value crops like vegetables. The vegetable crops required a regular water supply and boosted farmers' returns from the given small patch of land. Irrigation alone could not increase the farmer's income, but it required a simultaneous effort to improve cropping practices, explore market linkages, and diversify livelihood prototypes. It acted as a catalyst that strengthened the capability of farmers to invest in newer agriculture ventures as assured irrigation for the crops helps mitigate several uncertainties attached to rainfed agriculture. In doing so, it played an important role in achieving the "Lakhpati Kisan" goal.

The unique thing that the CInI team did throughout was a community-centred approach. The involvement of the community in the planning and implementation stages helped the CInI team come up with contextualised solutions. The Revitalizing Rainfed Agriculture (2019) Network rightly highlighted the lack of contextualised planning by the Jal Shakti Ministry concerning smallholder farmers in the rainfed region. For the longest time, the focus was on larger infrastructures in extending irrigation services, which time and again excluded the small land-holders from benefitting. Moreover, large, engineered dams or well schemes were not of much use in tribal geographies as they left out land development, which was of the utmost importance in these areas (AKRSPI, 2021).

However, in many countries, the democratisation of water proved to be a remarkable tool in water management (Shah et al., 2021). This was backed by the approach taken by CInI, where water user groups successfully took responsibility for self-regulating the funds and taxes for water infrastructure maintenance. As Shah et al. (2021) mentioned in the article titled "Water and Agricultural Transformation in India: A Symbiotic Relationship—II", participatory irrigation management effectively extended the last-mile connectivity to farmers through tertiary-level canals and minor structures. Developing the capacity of farmers through exposure visits and training facilitated the implementation of projects by local communities themselves and supported the fair, safe, and sustainable use of natural resources (Pastakia & Oza, 2011). Similar success was witnessed by CInI's interventions, as community participation in both planning and implementation stages, as well as contributions in terms of cash or kind, increased their stakes in the water structures created and paved the way for better operation, conservation, and management of resources.

The ecosystem and problems of farmers living in rainfed areas and the extended solutions differed. It was realised that understanding the socio-economic status of target households and communities was important before implementing irrigation-led interventions. This helped in planning the credit models for the interventions.

Irrigation, as the title suggests, has truly been an enabler in improving not just agricultural output but also the lifestyle of the farmers. The irrigation project started to enhance farm produce but ended up providing further livelihood options, such as livestock expansion. By involving women in the WUGs and other committees, CInI achieved a milestone of inculcating entrepreneurial qualities in women farmers, giving them the confidence to become self-driven and break glass ceilings in rural settings. Now, these businesswomen do not hesitate to make decisions related to investments in irrigation assets or bargaining with vendors.

As seen earlier, schemes provided by the government, such as PM-KUSUM, PMKSY, etc., could improve agricultural productivity by facilitating irrigation. However, they ended up not being used by farmers because they were not customised to the needs of small and marginal farmers, or the timely leverage was an obstacle. The government needs policies that align with the needs of the SMF. There must be a single-window mechanism for farmers to gain all the knowledge, facilities, and paperwork regarding any potential scheme. The NGOs and CSOs that created lucrative pioneer models for expanding irrigation access to the SMF should be adopted by the government in their development plans, and the same should be scaled up at a wider level.

Nonetheless, the implementation of this project was not easy. As mentioned in the next section, there were many challenges. In Phase Two of CInI's project, they will try to address and accommodate the obstacles they faced in the first stage.

4.7 Key Challenges Faced

There are many new structures created by CInI in a few areas depending on the expected rainfall, but these structures sometimes remained underutilised in case of below-normal rainfall. Thus, at times, CInI fell short of proper prediction and planning. Stronger community support, external funding, and government support were needed to enhance the farmers' livelihoods in the four states.

4.7.1 Elevation and Untreated Uplands

It was difficult to do a few lift irrigation projects because of the high elevation and long distances between the source of irrigation and the farmer's field. Therefore, some sites remained non-functioning. In a few areas, the

natural groundwater recharge was low due to the topology, so there was not enough water to supply through lift irrigation. Particularly in the uplands and midlands of Gujarat and Maharashtra, groundwater availability was low as the rainfall and water runoff were high, resulting in insufficient storage. The uplands in most areas were still underutilised and could be brought under irrigation only after proper treatment. This was not easy due to the higher costs attached to the treatment of these uplands. Sometimes, it fell under the administration of the forest department, and irrigation-related work permissions were not granted.

4.7.2 Mobilise Funds under Government Schemes

It was also difficult to mobilise funds under several mainstream government programmes. For instance, under MGNREGS, convergence was not easy. The authorities appreciated the CInI's model of wells and lowland ponds but were not eager to work with NGOs. It was difficult to mobilise government funds, and CInI was also bound by financial and resource constraints and depended on grants to expand its interventions.

4.7.3 Collection of Maintenance Funds and Optimal Utilisation of Irrigation Infrastructure

The irrigation beneficiaries had to pay a fixed Irrigation Service Fee per season for the effective and continuous use of water for irrigation, which was utilised as a maintenance fund. However, in some instances, some farmers refused to contribute to this fund, leading to an uneven collection of money. This created an equity problem and led to conflict among the farmers, ultimately affecting the optimal utilisation of the irrigation water infrastructure.

4.8 Summary and Conclusion

The CInI and its impact made it clear that irrigation impacted agricultural outcomes. It improved productivity and acted as an enabler that increased the standard of living of rural farmers. From these success stories, it was evident that farmers benefitted as they could produce more, sell more, and reinvest from the earned profits. The next generation also benefitted from this programme. The farmers could enrol their children in English-medium schools with higher fees.

The CInI team intervened according to the topography of all four states. The western part of India differed from the eastern and needed different approaches. Structures were created in the uplands, midlands, and lowlands, and the potential was unlocked. This also increased the chances of succeeding. The adoption of new structures and the implementation of watershed

programmes ensured the conservation of water, which had environmental benefits. When multiple farmers used the same assets, it ensured careful usage of available resources. Thus, problems like wastage of water and wastage of energy resources were automatically minimised, which in turn stopped the overutilisation of limited and expensive assets.

An important aspect of CInI's planning was to make the community independent in making implementation, management, and conservation decisions. The most important aspect was also to make this increase in income irreversible. CInI strived to achieve this by taking all the important measures, from gaining farmers' trust to making them aware of all the procedures, available resources, and finally showing them the results by improving their lives.

In this process, there was a need for a huge investment. Around Rs. 50,000–60,000 (USD 673.07 to USD 807.69) had to be invested per household. In later years, the beneficiaries from the community themselves started contributing a share of their income, which also gave other farmers confidence that they could achieve good results by being a part of this initiative. That was a success for CInI. The CInI team realised the multifaceted, long-term challenges regarding water scarcity that could arise in the longer run. Since the primary goal was to boost the capability of smallholder farmers that have been unable to realise their potential, CInI was unable to work much on the sustainability of the water ecosystem (resource) in the first five years. It was a major concern of the 21st century that needed attention, and CInI insisted on sustainability. Meanwhile, the journey continues to give more and more smallholder farmers access to irrigation so that they can grow multiple crops in a year, irrespective of rain failures, and improve their quality of life after having a certain degree of financial stability.

In all, it can be said that water was a key that opened the lock to the gateway of prosperity in terms of opportunities and benefits in agriculture. CInI was able to provide this key to the farmers and, simultaneously, ensure that they did not exploit it to their loss. Providing access to irrigation emerged as a critical heroic element in the goals of Lakhpati Kisan, which not only enhanced monetary benefits for the farmers but also upgraded their skills, personality, and confidence and, at the same time, opened up the prospects for livelihood diversification.

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Annexure 4A

TABLE A Area (in Acres) under Different Irrigation Source

State	*Bore Well*	*Check Dam*	*Lift on River/ Seasonal nala*	*Pond*	*Well*	*Well Renovation*	*Water Harvesting Tank*	*Others*	*Total*
Gujarat	1,599.5	1,466	3,847.28	0	584.03	4,877.94	0	0	12,375
Maharashtra	296.32	933.95	581.01	0	4,833.16	0	285	0	6,929.4
Jharkhand	0	112.44	222.65	663.45	2,610.9	0	1.2	0	3,610.6
Odisha	43.25	0	37.75	50.1	8	0	0	14.6	153.7

TABLE B Number of Households Benefitting from Different Sources of Irrigation in Four States after CInI's Intervention from 2015–2016 to 2020–2021

State	*Bore Well*	*Check Dam*	*Lift on River/ Seasonal nala*	*Pond*	*Well*	*Well Renovation*	*Water Harvesting Tank*	*Others*	*Total*
Gujarat	1,313	844	4,155	0	438	5,357	0	0	12,107
Maharashtra	68	598	469	0	3,430	0	0	211	4,776
Jharkhand	0	133	354	711	2,564	0	3	0	3,765
Odisha	173	0	140	202	32	0	0	73	547

TABLE C Types of Interventions Under LKP and Average Unit Cost

SL No.		*Name of Activity*	*Projected Command (Acre)*	*Households*	*Unit Cost*	*Cost/Acre*	*Cost/HH*	*Remarks*
1		**Group well**	**4–5**	**6**	**300,000**	**60,000**	**50,000**	**Excavation (7 × 9.2) metres, construction depth: 5.2 metres**
2		Well deepening	2.5	3	90,000	36,000	30,000	Existing depth 15–20 ft further deepening to 10 ft extra with some construction repair
3	3.1	Lift irrigation	10–12	15–18	750,000	62,500	41,666.7	Well with distribution network
	3.2	Bore well – electricity	6	6	350,000	58,333	58,333	Bore depth 300 ft and distributaries length up to 350 metres
	3.3	Solar irrigation pump (7.5 hp)	8	12	360,000	45,000	30,000	Under PMKUSUM
	3.4	Well – electricity	5	8	500,000	100,000	62,500	Well final depth dimension 6 × 9.2 metres, pipe line depth 300–500 metres
	3.5	Solar irrigation pump (5 hp)	6	8	275,000	45,833.3	34,375	Under PMKUSUM
4		Check dam	8–10	7	400,000	40,000	57,142.9	Link with downstream well including nala widening and deepening (check dam cost 2.4 lakhs)

SL No.	*Name of Activity*	*Projected Command (Acre)*	*Households*	*Unit Cost*	*Cost/Acre*	*Cost/HH*	*Remarks*
5	Desilting of existing water structure	4	6	200,000	50,000	33,333.3	Existing village tank, deepening up to 1–1.5 metres
6	Farm ponds	3	6	130,000	43,333	21,666.7	Dimension: 100 ft × 100 ft × 10 ft
7	Drip irrigation with mulching (irrigation methods)	1	3	85,000	85,000	28,333.7	For one acre of land
8	Soil & moisture conservation (SMC)	1	1	6,000	6,000	6,000	Treatment cost in acre

5

LIVESTOCK REARING

Lifeline for Marginal Farmers of the Rainfed Central India Belt

Kishore Kunal, Prasanna Modak, Prosenjit Mondal, Aditi B. Prasad, Nikhil Kumar Singh and Shaivya Singh

5.1 Introduction

Humankind has utilised animals and animal products for survival since the dawn of civilisation, be it for food, clothing, or labour. Many animals have also been tamed for companionship, entertainment, research, security, etc. This shows how the animal kingdom has been a beneficial investment for human beings. We can recount from historical lessons that humans depended on animal sources for their nutritional needs, and the agricultural practice of growing one's food was a skill developed much later. While agriculture is now a widespread practice for growing and obtaining food and nutrition, animal food sources remain relevant for a great proportion of the world population, accentuating the need for livestock rearing in the modern world. Livestock rearing is a popular choice of income generation in rural India, with livestock providing subsistence to the owner and acting as a safety net that can cushion the impact of crop failure due to socio-environmental conditions.

Livestock is a crucial part of the livelihood for the agriculture sector of India, including small and marginal farmers who depend on livestock rearing as a major source of income. It is believed to prevent a descent into poverty in the country's rural regions, with about 70% of total livestock held by small and marginal farmers and some portion held by landless labourers (Das et al., 2020). The 20th livestock census conducted in 2019 gives us comparative data on the growth observed between 2012 and 2019, with a 1.34% growth in cattle, a 1.06% increase in the buffalo population, a 10.14% growth in goats, a 14.13% increase in sheep, and a 4.82% increase in total livestock in the country, including animals such as yaks, camels,

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pigs, etc. (Das et al., 2020). This rapid increase in seven years represents the increasing dependence on livestock to improve the rural landscape's socio-economic conditions.

Various other economic and non-economic factors are responsible for the rapid rise in livestock demand in rural and urban areas, such as the changing food habits of the general human population, increased elasticity for meat product consumption, increasing population pressure on land, etc. In arid and semi-arid regions, small ruminants such as sheep, pigs, and goats play an important role in improving the socio-economic conditions of rural inhabitants. As per the livestock census 2019, there are about 74.26 million sheep and 148.88 million goats in India (Shinde & Mahanta, 2020). The diversity of small ruminant livestock in the country has massively contributed to the agrarian economy; especially in regions where crop cultivation or dairy farming could not be as economical as expected, livestock has aided subsistence and income.

A similar scenario was observed in the initial stages of LKP. The initial evaluation of the programme's intervention derived the outcome that focussing on increasing "crop productivity" alone might not be able to make the targeted households "Lakhpati". By carefully analysing the livestock scenario in the tribal areas, CInI realised the immense potential that livestock rearing holds. NITI Aayog also identifies the role of livestock in the growth of the agriculture sector and stresses the need to work on increasing productivity for crops and livestock to realise the vision of increasing farmers' income (Chand, 2017). Similarly, CInI had also visualised and designed differential models for specific clusters regarding livestock rearing to supplement their income from agriculture.

In tribal areas, livestock is a source of food and income security that can be used in times of distress and need. Since the targeted households were smallholder farmers of the rainfed tribal regions, crop productivity was accompanied by extra risks. The tribal households adapt to their uncertain situations by diversifying their livelihood sources. However, the baseline survey conducted by CInI regarding livestock rearing revealed that it was not an instrument for upward mobility for the farmers, and there was also a lack of awareness regarding vaccinations and health care for the livestock. The high mortality rate and relatively poor productivity reflected the poor health interventions and improper animal infrastructure.

Under these circumstances, CInI decided to explore the scope of livestock in increasing farmers' income. It identified livestock development as a key livelihood prototype and focused on layering it over the ongoing agricultural work with the households. In its Standard Operating Procedure for livestock, mainly small ruminants, CInI highlighted the importance of goats and pigs for poor tribal households. The percentage of households owning goats and pigs was 66% and 1%, respectively. Owing to the cultural

and social restrictions on the consumption of cattle, the scope for goat and poultry (even sheep and pork in specific regions) was immense in the Indian market for their meat (Saxena et al., 2017). In addition, India was also a big market for dairy products and had about 57.3% of the world's buffalo population, implying the tremendous scope of dairy farming. To capitalise on the contemporary livestock scenario, CInI realised it needed to work simultaneously on awareness, demand creation, funding, and innovative ways to link the farmers with the market.

Although there were specific plans for implementation designed to support farmers' income through livestock rearing, the identification and integration of different stakeholders was the "mantra" with which CInI decided to move forward. The major stakeholders identified were district-level dairy cooperative federations, targeted households, SHGs, village organisations, and partners. Upon realising the stakeholders' different aspirations, capacity, and limitations, CInI started region-specific innovations that were simple yet effective, such as introducing *Machans* for goats in shelters. By introducing different models with some region-specific changes, many clusters in the target states showed great potential for livestock rearing, such as cattle for dairy production in Gujarat and goat rearing in almost all target states, with the most potential in Jharkhand and Maharashtra.

During the five years of the Lakhpati Kisan programme, capacity building was not just a fancy term but an integral practice. The purpose was to elevate the negotiating positions of farmers concerning cattle traders and local goat, pig, and poultry procurers. Working on these lines to provide the best deal for their assets, CInI saw an opportunity to scale up its entrepreneurial models, especially for goats. Successful ventures creating entrepreneurs helped the farmers decrease their dependency on distant service providers and traders and enabled those farmers with a progressive attitude to maximise their profits irreversibly. It also paved the way for self-organisation and regulations between farmers, service providers, and entrepreneurs, thus facilitating the successful exit of CInI from its regulatory and management role as it ensured an environment of irreversible, sustainable change for these vulnerable communities and households.

This chapter explores the four prototypes of livestock adopted by CInI – goat rearing, dairy, piggery, and fishery. It discusses the problems and challenges associated with the prototypes in the tribal areas and interventions at the field level. We also discuss the untapped potential of backyard poultry as a future intervention for Lakhpati Kisan 2.0. This chapter will explain the interventions designed and adopted to supplement the farmers' income and CInI's attempt to incorporate community responses and resources for scaling up.

Rearing small ruminants such as goats was a dominant practice carried out by landless, small, and marginal farmers in dry regions of India, being a

more cost-effective endeavour than cattle rearing since dairy farming might not be economical in such geographical locations (Pathak et al., 2020). It was an integral part of the rural economy and considered one of the most profitable livestock production systems. It contributed to the total household income and generated employment (Kumar et al., 2008). Regarding its significance, goats are like "Cows for the Poor", sustaining marginal and landless farmers (Shinde & Mahanta, 2020). Even in adverse conditions such as food and water scarcity, the family members engaged in goat rearing could sustain them.

Goat rearing served as a supplementary source of income for rural farmers while also fulfilling the meat demands of the growing population. In the central Indian tribal belt, goats were reared mainly as a source of meat. Goat meat was lower in calories, fat, saturated fat, and cholesterol. Due to the low content of saturated fatty acids and cholesterol, goat meat in the human diet was a healthier alternative to other red meat (Ivanović et al., 2016). Moreover, unlike pork and beef, there was no taboo attached to goat meat for most of the Indian rural population, and people of different religions consumed it.

Many farmers in the rural clusters reported changes after CInI's arrival. They highlighted the poor health care services (de-worming and vaccination) and the lack of seriousness in increasing income through goat rearing in the clusters before the interventions.

CInI worked on the goat production system in all 17 clusters of their target states as a livelihood prototype to move towards the Lakhpati pathway. The focus was on layering goat prototypes with landless and marginal households engaged in agriculture but with no or poor irrigation facilities. It was an existing livestock farming practice in all 17 clusters for a long time, but it did not prove remunerative income-wise. However, CInI's take on goat-rearing increased farmers' incomes and led to overall community development.

Livestock, in general, and dairying, in particular, play a vital role in the Indian economy and also in the socio-economic development of many rural and tribal households (National Action Plan for Dairy Development-Vision 2022, GOI). Gujarat, known for being one of the pioneering states of the white revolution in India and cooperative dairy systems ever since the inception of Amul, observed multiple farmers raising dairy animals such as cows and buffaloes at their homes. Thus, the districts and CInI's target clusters in Gujarat aimed for dairy development. The dairy cattle of progressive farmers were targeted as one of the layering prototypes for livestock rearing, which could be improved to supplement farmers' income (Table 5.1).

The rural situation in the CInI target clusters in Gujarat was similar to that of the people in adjacent backward districts of Rajasthan and Madhya Pradesh, with which it shared its borders. However, the dairy

TABLE 5.1 Number of Households Involved in Livestock

State	*2015–2016*	*2016–2017*	*2017–2018*	*2018–2019*	*2019–2020*	*2020–2021*
Gujarat	4,201	7,415	43,393	44,080	45,141	43,939
Jharkhand	1,892	3,899	8,620	18,551	20,223	20,410
Maharashtra	42	435	905	1,969	2,346	3,892
Odisha	813	503	651	2,578	1,776	907

farmers in the Gujarat cluster had the advantage of access to markets for their milk through the established village dairy centres of milk producers' cooperatives.

The CInI team's effort focused on inducting an improved breed of dairy cattle for the smallholders. They organised them and established a new dairy cooperative, revived defunct dairy cooperatives, improved management practices, ensured access to preventive health care services at the doorstep, and capacity building for dairy farmers. They linked them to the village dairy centres for marketing their milk surplus and with various government schemes for facilitating access to institutionalised credit for availing of cattle sheds, fodder cut machines, etc. A crucial area was capital fund acquisition through the provision of loan facilities. The federation took the lead role in linking them to various financial institutions like Rang De, local rural banks, the National Bank for Agriculture and Rural Development (NABARD) under the UPNRM programme, and the NABARD-NRM dairy development project set up to provide affordable loans for an initial investment in inducting good quality dairy cattle at the household level. This restructuring of livelihood activities helped boost agriculture-based livelihoods to diversify risk and ensure the achievement of the Lakhpati mark.

Pig rearing was a prime occupation of the poor tribal people in the Chota Nagpur plateau area. Pig rearing occupies a very important status among the tribal population of the eastern Indian states like Jharkhand, West Bengal, northeastern states, and Odisha as the preferential diet, especially of the poor tribal people of these states, was pork. Paradoxically, pork production in these states was low, although the per capita consumption was higher than elsewhere. This gap between demand and supply could be mainly attributed to the rearing of nondescript category pigs with poor productivity and stunted growth. The low productivity was again due to the farmers' lack of knowledge about the scientific management, housing, and breeding of pigs.

During the initial years of CInI (2015–2016) in the Murhu and Churchu blocks of the Khunti and Hazaribagh districts, the team observed that many farmers engaged in Lac cultivation had little or no agricultural land for high-value cultivation agriculture. At the same time, it was observed that several households were engaged in pig-rearing practices, which showed the scope for additional income for the farmers. Seeing the high demand for meat and the economic advantages of pig farming, pig rearing was included as a major prototype under the Lakhpati Kisan programme to help the farmers of the Khunti and Hazaribagh districts double their income. In this regard, CInI, with small investments in building and equipment, proper feeding, and a sound disease control programme, helped farmers utilise their time and labour in this subsidiary occupation to earn more.

5.2 Challenges Faced by the Community

At the beginning of Lakhpati Kisan, CInI felt it essential to conduct extensive qualitative and quantitative studies to identify gaps in the existing livestock systems across different clusters. This helped the team understand that the gaps were not due to any single or isolated reason but were the cumulative result of multiple socio-economic factors and the geography/backwardness of the area. In other words, the small herd sizes, higher mortality rates, improper care facilities for the animals, etc., were some of the problems which were the effects of multiple issues that the farmers faced in their everyday life. CInI identified multiple challenges for different animals. For goats, they were as follows:

5.2.1 Unavailability of Preventive Health Care Services

Geographical isolation and poor road connectivity were the major challenges for the area, which, in turn, prevented the farmers from accessing the existing preventive health care services. As per the law, there was one government veterinary officer in every block. A group of Livestock Inspectors (LI) was appointed to provide/extend health care services in the area. Despite this, the ratio of farmers to service providers was very high as one LI (service provider) was responsible for about 2,500 to 3,000 households. Furthermore, long routes and poor road connectivity prevented the LI from reaching every hamlet regularly. As a result, they only visited during disease outbreak scenarios and when farmers were ready to pay a high amount for their services. The farmers also showed little interest in providing preventive health care services. Even community mobilisation for mass vaccination seemed too big for one livestock inspector, preventing the mobilisation of 2,500 to 3,000 households.

5.2.2 Low wareness about Preventive Health Care Services among Farmers

Due to almost negligible visits from the LI, the area's farmers were unaware of the services available at the block veterinary department. They hardly knew about the preventive health care services available at the block office. When the veterinary service provider came to the villages, the villagers refused to take the services. They had long developed superstitions and negligence towards the vaccine and tablets. This was, in turn, another reason for the health care service provider being disinterested in providing preventive health care services. The low awareness regarding hygienic practices had negatively affected the care and management of pregnant goats and newborns. The poor hygienic practices badly impacted the kids' growth, leading to a very high mortality rate.

5.2.3 Primarily Grazing-based Feeding Practices

Healthy feed is required to rear healthy goats, especially for pregnant mothers and kids under six months. In traditional practices, it was noted that feeding was mostly dependent on grazing. Early in the morning, the goats were taken to the grazing field, usually the nearby forest area, and brought home by sunset. Hence, they ate whatever they found in the forest as there was no practice for supplementary feeding or providing safe drinking water. This malpractice often causes stunted growth in the young ones and further weakens pregnant goats.

5.2.4 Shortage of Quality Feed and Fodder

The nutritive feeding of dairy cattle is crucial for maximising milk production. However, the animals were used to eating farm wastes and were not considered healthy due to their low nutrition levels. The fodder scarcity, seasonal availability of fodder, and feed costs affected milk production and local dairy development.

5.2.5 Inbreeding Practices Leading to the Quality Deterioration of Breed

The predominant breed of goats reared in Jharkhand and Odisha was the Black Bengal. Regarding productivity and taste of the meat, it was one of the best breeds in India. But the existing inbreeding practices by the farmers resulted in inferior offspring. Inbreeding practices are "the mating of animals more closely related than the average relationship within the breed", which results in an "overall lowering of the performances" (Dele Vogt, Helen A. Swartz, and John Massey, Department of Animal Science, University of Missouri). The farmers kept all of their goats in a common shade, increasing the chances of inbreeding. It was observed that the buck was rarely segregated and had no separate place. Not to mention, the bucks were not regularly changed within a two- or three-year time span. All of this promoted inbreeding practices, and over time it led to a relatively poorer efficiency of the reproductive system, low growth rate, and higher mortality among the herd.

5.2.6 Poor Quality Breed

In the rural clusters of Gujarat and Maharashtra, however, the problem with the breed was different. The quality of local breeds was not up to the mark as they were small and had significantly lower growth rates. Lower productivity and poorer meat quality in taste did not make the goat rearing practice a commercially viable option for the farmers. Since genetic diversity has

long been recognised as the key to sustainable improvement in livestock production systems, breed improvement was necessary to eliminate the genetic bottleneck.

5.2.7 The Low Productivity Level of Dairy Animals

The low genetic potential of indigenous dairy cattle resulted in low productivity levels. Thus, it restricted the farmers from linking with the established milk producers' cooperative dairy centres and earning incremental income.

5.2.8 Lack of Access to the Institutional Credit System

The farmers, who were already in a financially disadvantaged condition, were unable to obtain loans from banks, which either refused to provide loans or had high interest rates on the loan amounts provided by local money lenders, making it difficult for farmers to avail themselves of the credit support to buy improved livestock breeds. This financial hitch also added to the hesitation to expand the livestock to increase production.

These factors cumulatively resulted in a high mortality rate among goats, so productivity was low. In Jharkhand and the Harichandanpur region of Odisha, goat mortality was as high as 23% (FES, 2020) and 33%, respectively. The higher mortality of goats led to smaller herd sizes. This adversely affected the meat yield, which, in turn, lowered their income. Thus, the major objective of CInI was to enable the farmers in a way that the mortality rates of the goats could be reduced and simultaneously increase the herd size to maximise productivity.

A similar set of barriers was observed for dairy practices among selected clusters. Livestock rearing was an integral part of the lifestyle of the tribal population in the project areas of CInI. Dairy farming in the tribal regions of the Gujarat cluster holds enormous promise, although it suffered from a high mortality rate and lower productivity (CLNL, 2020).

A major chunk of farmers in the potential dairying villages of these clusters owned one or two cows or buffaloes of the indigenous variety, producing about 1–3 kg of milk per day. This produce was the lowest among each animal category, according to the local CBOs and the villagers.

During the summer season or the dry periods of in-milk female cattle, this small amount was almost always used up for consumption, and there was no surplus milk available to sell. Ultimately, the farmers had no year-round income security from this livelihood. Some of the major challenges faced by the smallholder dairy farmers of the project areas are given below:

- **Low productivity of dairy animals**: The low genetic potential of indigenous dairy cattle resulted in low productivity levels. This restricted the

farmers from linking with the established milk producers' cooperative dairy centres and earning some good incremental incomes.

- **Shortage of quality feed and fodder**: The nutritive feeding of dairy cattle is crucial for maximising milk production. However, the animals were fed on farm wastes and were not considered healthy due to their low nutrition levels. The fodder scarcity and seasonal availability of fodder, along with feed costs, also impacted the increase in milk production and local dairy development.
- **Poor access to animal health care facilities**: The farmers often struggled to take care of the cattle as their care and maintenance were an added burden on top of their already deteriorating financial status, with no additional income through milk sales to cover the cost of sheltering and feeding these dairy animals. The mortality rate was higher due to lower, or even negligible, access to preventive health care services at the disadvantaged's doorstep.
- **Low count of improved breed dairy cattle**: With the lack of high-yielding dairy cattle within the community, milk production and surplus were lower than even the minimum required quantities to be procured. Suppose a milk producer cooperative is to be started. In that case, it would require at least 150–200 litres of milk per day per village to facilitate its marketing at village dairy centres and transportation through the milk producer's cooperative. This posed a major barrier for the villagers who could not sell it through appropriate channels despite having a small surplus for sale. Thus, they were losing an opportunity for earning supplementary income.
- **Lack of access to the institutional credit system**: The farmers, already in a financially disadvantaged condition, could not obtain loans from banks which either refused to provide loans or had high interest rates on the loan amounts provided by local money lenders. This made it difficult for farmers to avail themselves of credit support to buy improved breed dairy cattle. This financial hitch also added to the hesitation to expand the dairy cattle to increase production.
- **Poor extension support and doorstep services**: The access to constant training support for dairy farmers on better livestock rearing practices was negligible, which was necessary to improve dairy engagement. Besides tying up their mechanisms with the milk producer's cooperatives for milk marketing, the missing link was critical for our smallholder farmers. Also, the access to the doorstep preventive health care services required to address the mortality rate in cattle was vividly neglected in the area, particularly for the small and marginal farmers who live in scattered habitats.

Upon introducing pig rearing as a prototype, the first major gap area to be filled for the group was to create and spread awareness about the scope of

pig rearing. And just like the goat prototype, the team's primary challenge was the high mortality rate. Based on the primary survey data, the mortality rate was as high as 25–30% in the region before the intervention. This explained the lack of awareness among the farmers in the focused districts of Jharkhand. Foot-and-mouth disease and swine fever were identified as the major causes of death for the piglets. The target households also lacked awareness of preventive and curative health care services required for pig farming.

Another major task was regarding the feeding practices of the pigs. Although the pigs were known to eat almost anything given to them, a planned feeding practice could speed up the growth of the piglets. However, after the initial years of intervention, the local breed was identified as a gap area for the project. The "desi" breed of piglets was found to have a relatively slower growth rate, and the feed-to-meat conversion ratio was not promising. Therefore, the major action area of CInI was to provide better breed stock for the given ecosystem and bridge the knowledge gaps between farmers and available health care practices.

With the vision of giving farmers an additional income of Rs. 25,000–30,000 from pig-led interventions, CInI focused on two important aspects: health care and feeding practices. The first major task for the group was to create and spread awareness about the scope of pig rearing. It took a series of discussions with village organisations, service providers, and village households to motivate and create confidence among the communities. Group discussions and melas were planned to spread the message that with the proper availability of preventive and curative health services, feeding practices could be increased to an amount that could get the households a considerable income.

5.3 How CInI Addressed These Problems

The major interventions by CInI in livestock rearing practices were done only after understanding the problems and consulting with tribal communities. Several local stakeholders, along with the community, were involved in the entire process. For instance, in the case of pig rearing, the CInI team consulted Dr. S. K. Singh, who was then affiliated with Natural Resource Management at Birsa Agricultural University, Ranchi.

5.3.1 Ensuring Preventive Health Care Services at the Doorstep

The main concern across all livestock was the worrying mortality of animals. To reduce the mortality of animals, CInI introduced several corrective measures. The awareness programme for livestock rearing was twofold. Firstly, melas and group discussions were planned to spread the message that households can get considerable income with the proper availability of

preventive and curative health services and improved feeding practices. The follow-up to the above step was regularly organising health camps in the selected villages.

Regular visits from veterinary doctors identified the causes of high mortality, diseases, and the cause of nutritional deficiencies in goats, which helped chalk out plans to kerb these problems. The major issues highlighted were inadequate infrastructure, improper feed, and insufficient health check-ups. The veterinary experts provided essential vaccinations and deworming medicines for the livestock and advised on improving the nutrition of the animals. They paid regular visits to help monitor the health status of the goats until a major improvement was observed.

As an extension of veterinary services, CInI helped appoint "*Pashu Sakhi*" from among the villagers, who became the contact point of primary care in case of emergencies. *Pashu Sakhis* provided immediate care until an expert or professional assisted the animals. The FES (2020) evaluation report observed that goat mortality in Santrampur, Gujarat, reduced from 23% to 3% after field-level interventions. The prompt health care services, coupled with preventive and curative health care solutions, brought down the mortality rates of goats and led to an increase in herd size. A large herd size increased the estimated profits of farmers, bringing them closer to the lakhpati mark.

Furthermore, health care camps were organised in association with the local veterinary department of the government in a drive mode for large and small ruminants, where the local institutions of women farmers played a major role from planning to implementation. The main aims of this were vaccination and deworming. To improve the efficiency of preventive measures, training camps were organised regularly. These camps included training the community on desired disease management practices, building the technical capacity of the service providers, and facilitating the sharing of experiences from households in good livestock rearing with prosperous farmers as cross-learning for adopting improved management practices.

5.3.2 Increasing Awareness Level among the Farmers

The CInI team started with the farmers' and livestock owners' training and education on the importance of infrastructure and nutritional reforms to improve livestock health and productivity. The team also informed them about the benefits of layering this activity with farming to supplement their annual income more efficiently. Under experts' guidance, the farmers could undertake livestock rearing with improved methodologies and inputs. CInI developed information, education, and communication (IEC) materials such as pamphlets, posters, wall paintings, and movies to increase awareness about improved goat-rearing practices. There were discussions on issues of

livestock rearing with service providers to enhance community knowledge and participation in the process.

Training sessions were conducted on shed management, disease symptoms, and preventive measures. Identifying does and bucks, the importance of deworming and vaccination as life cycle preventive measures, castration, etc., were other issues discussed to equip the farmers to take the lead in these interventions. Regular interactions and events such as health melas created a demand among the community to adopt new livestock rearing methods.

The construction of sheds with proper ventilation and protection, ensuring smooth cemented flooring to maintain dry flooring for the goats, was critical to maintaining health and hygiene. Wetness or moisture in the sheds attracted diseases and pests to the goats, adversely affecting their health and productivity. The sheds' floors were disinfected with lime to ensure cleanliness. They were constructed with waterproof roofs and strong fencing to provide properly ventilated shelters while protecting them from predators. Existing sheds were repaired to align with the programme's guidelines for shed construction with certain key indicators to check their effectiveness and durability. The designs were created considering the easy cleaning of the sheds and removable roofs to ensure ample sunlight in the structures. Households also created local innovative bamboo-based sheds with design support from CInI.

Similarly, the interventions by CInI regarding pig rearing would not have delivered such great results if pigsties were not made compulsory before procuring piglets. On the other hand, the families with whom CInI worked belong to financially weaker sections that could not afford to invest a large amount in shed construction. However, community contribution was considered a must to ensure that the farmers owned the project and got invested in it rather than viewing it as a free deliverable. It was decided that community contribution is not only for monetary contributions to address this dilemma. To ensure that farmers took ownership of the project and became invested in its success, rather than seeing it as a free deliverable, community contribution was deemed essential. It was decided that this contribution didn't have to be purely monetary to address this challenge. Instead, the farmers who could not contribute monetarily could contribute by giving their labour or local materials, such as bamboo. This strategy greatly impacted bringing the farmers on the same footing and engaging them with the project.

Apart from this, there were a few guidelines that the farmers were made familiar with. For example, special attention was to be provided in the shed during the farrowing time, such as preparing guards, keeping paddy straw, and keeping males away from the female pigs during and post-delivery.

5.3.3 Promotion and Establishment of Women-Led Initiatives

The promoted SHGs in the village have played a major role in educating the members on the need and demand for establishing women-led village dairy cooperatives or reviving defunct dairy cooperatives where women members could also actively participate in decision-making.

Under LKP, women had already experienced the benefits of their active engagements in agriculture-based livelihoods at their household level, providing them with economic and financial empowerment. Therefore, their approach also prioritised the involvement of these SHG women in running the dairy cooperatives. Thus, out of the total village dairy cooperatives, newly established or revived, about 53% were women-led cooperatives, and the rest had mixed membership.

Earlier, these cooperatives primarily used to be male-led. Due to CInI's consistent efforts, the SHG women started leading, positively impacting the village dairy business's growth. The women-led cooperatives assist farmers in raising their milk-based income. Women's collectives' rigorous and continuous efforts built the village dairy cooperative and the village-level ecosystem for promoting the dairy prototype. Furthermore, these cooperatives gave rise to several women entrepreneurs (Boxes 5.1–5.2).

Box 5.1 Geetika Mahto

Geetika Mahto is a 34-year-old resident of Makri village in the Gurabandha block of Jharkhand. Her great work ethic and active interest in goat health care and business helped her become a "Goat Entrepreneur" in her region in June 2021. She has been a Livestock Service Provider (LSP) to the community members since 2017, helping them with different health care treatment processes for goats, such as deworming, castration, vaccination, and artificial insemination. This has helped create an entry point for her in the village, as her work showcased her goodwill and commitment.

Geetika invested 2.60 lakhs and took a loan of 40,000 rupees to start her goat business. She expects to cater to around 500 households and earn around 90,000 annually. As a goat entrepreneur, she creates market linkages for other goat rearers by procuring goats from them and selling them collectively to either the local farmer producer company or even beyond to the market at large. Initially, Geetika faced issues procuring goats from the villagers as they were priced quite higher than the market rate. Still, she has been able to leverage her links with the local farmer producer company to overcome this issue. This is supplemented by the health care services she provides for the goats in her village. She hopes to expand further into the Odisha market for better income-earning opportunities and business growth.

Box 5.2 Shantiben

Shantiben's family relied on her 1-acre land for their main income, but only 20 Guntha (half-acre) had an irrigation facility. In addition, she had 32 goats in 2017–2018. Due to limited income sources, her family struggled to bear all the costs for all her family members. During the same year, she lost five goats due to illness, which put her into more financial trouble. Shantiben's and her family's main income depended on her small agricultural land of 1 acre and the animals she had. After joining the Shree Jay Gurudev SHG, Shantiben attended group meetings regularly and contributed to group savings. She also attended animal husbandry training, agriculture training, leadership training, exposure visits, PoP training, etc., conducted through the HDFC (HRDP) project. Previously, she did not know about the treatment that should be given to animals/goats. After training in animal husbandry, she learned to provide goats proper care and nutrition (through *Azolla*). As a part of the project intervention, a vaccination camp was organised, and she also took part in it to provide health care to her animals/goats. This year, the mortality rate had fallen to zero as she had not lost any of her animals due to illness. She also constructed an *Azolla* unit in her home, which helped her animals/goats gain more weight. In 2018–2019, she sold a total of four bucks with earnings of Rs. 36,000 and three more goats with earnings of Rs. 33,000 in 2019–2020. With her intervention and change in adopting care and nutrition practices, she grew her family income by selling the goats without losing livestock. Shantiben has built her goat farm, investing a total value of 1 lakh rupees in building a goat farm with a proper shed with her income. She has 26 goats, including 8 Sirohi breed goats and 2 others.

5.3.4 Extension of Training on Good Management Practices to Educate Farmers on Improved Rearing Practices

Over the period, CInI capacitated farmers, community leaders, CRPs, SHG members, federation members, and team members through training and capacity-building programmes. The CInI team provided constant training support to dairy farmers on feed and fodder management. Farmers were linked to village and district-level cooperatives for marketing. Regular training and animal health camps created awareness among farmers.

Working towards improving desired livestock rearing practices, the utmost importance was given to the capacity building of the farmers through IEC activities. The farmers and institutions discussed the local rearing practices by conducting FGDs to identify various gaps. Based on the available information and observing the bottleneck gaps, several pamphlets and banners were developed in the "Package of Practices", along with wall painting messages

and street plays (Bhavai/Kalajatha). Such activities imparted knowledge of the desired feed, fodder, and disease management practices.

Furthermore, information on various government schemes was shared through short films and the distribution of pamphlets. The Animal Husbandry Department of the Government of Gujarat provides continuous support to CInI by mobilising dedicated funds and other sources in the required clusters. This approach, paired with other interventions, led to massive improvement in livestock rearing in these areas.

The tribal farmers of the Khunti and Hazaribagh districts had envisioned pig rearing as an occupation that could give them a good amount of yearly income if managed scientifically. CInI provided the necessary support to develop and strengthen the scientific knowledge of pig rearing and yield greater returns for the farmers. CInI systematically planned to ensure the capacity building of farmers in such a way that the project becomes sustainable soon.

The training calendar/schedule (in-house and on the field) was prepared for the year. This also included the schedules for health camps and exposure visits. These training programmes and exposure visits were designed to make the beneficiary community, service providers, and livestock coordinators more adaptive to the needs of modern pig rearing. CInI designed all the technical training; a brief plan can be seen in Table 5.2.

5.3.5 Introducing Feeding Practices, Especially for Pregnant Mothers and Kids

Though the farmers used to take the goats into forest areas for grazing and provided farm residue as feed, many goats were deficient in micronutrients. They were revealed to be underweight or malnourished. Calcium mineral bricks were made available for goats to lick, supplemented with other micronutrients to facilitate growth and weight gain.

TABLE 5.2 Training and Capacity-Building Programmes Organised by CInI

S. No.	*Name of Training*	*On Field*	*Indoor*
1	Orientation and technical training of LSPs and coordinators	√	√
2	Refresher training of LSPs and coordinators		√
3	Training to the community on vaccination	√	
4	Training to the community on feed formulation	√	
5	Exposure to LSPs, coordinators, and community on management practices	√	

Source: Author's compilation.

CInI also focused on promoting proper feeding practices. Farmers were encouraged to add silage and *Azolla* seeds to the feed for their goats, especially during the lean season of fodder in the summer. The farmers also experimented with other nutritional options such as maand (rice water) and saijan ke patte (drumstick leaves). With an increasing demand for proper nutrition, the supply of *Azolla* seeds fell short.

Availability of green fodder was a challenge, especially during the summer months. *Azolla* cultivation by livestock-rearing farmers and entrepreneurs has been taken up as a support intervention. Since *Azolla* is a rich source of nutrition, farmers added it along with fodder as supplementary food to feed their milch cattle. It enhanced milk yield for mulching cattle, ultimately benefitting the household income. The individual grow unit was provided to around 1,000 families. Mother grow units were provided to around 100 entrepreneurs to sustain the activity at the village and household levels.

Silage fodder demonstration aimed to promote nutritious fodder storage to address fodder shortage during the summer and kharif seasons. The scale was very low and had just been initiated with the potential consideration for expansion to meet fodder scarcity during the lean season. It was demonstrated to 50 farmers across the clusters in Gujarat.

Furthermore, biogas units were installed to fulfil the cooking fuel requirements at the household level with the support of Sistema Bio. The biogas units were integrated with dairy development to solve the domestic cooking fuel requirements and the smoke-free chulha features. This prototype was introduced, but the entry-point barrier was the higher costs at the household level. Thus, it was limited to only 50 families across different clusters of Gujarat.

5.3.6 Introducing Improved Quality of the Breed

While programming the design, CInI paid close attention to the breeds of goats. The local breeds of goats used by farmers did not gain much weight and, thus, didn't generate a substantial income. After thorough research, CInI decided to introduce high-quality breeds from neighbouring states to strengthen the breed quality for the farmers (Table 5.4). The clusters in Gujarat imported the Sirohi breed of goat from Rajasthan, while the Maharashtrian farmers imported the Osmanabadi breed from the nearby Beed market in Maharashtra. The Black Bengal breed was quite popular in the states of Jharkhand and Odisha. This breed was primarily known for its good quality meat and disease resistance. The other states have also shown a tremendous increase in the supply of improved bucks from 2015–2016 to 2019–2020.

Importing breeds from other states opened gateways for goat entrepreneurs. Since high-quality breeds imported from other states travelled long distances and cost a lot, the farmers bought very few. CInI promoted goat

TABLE 5.3 Number of Households Involved in Goatery

State	*2015–2016*	*2016–2017*	*2017–2018*	*2018–2019*	*2019–2020*	*2020–2021*
Gujarat	3,019	5,602	37,598	39,144	36,980	40,633
Jharkhand	1,635	3,632	8,233	17,731	19,249	19,921
Maharashtra	42	435	905	1,969	2,346	3,892
Odisha	813	503	651	2,578	1,750	907

Source: Data from the MIS.

TABLE 5.4 Block-Wise Availability of Waterbodies for Fish Cultivation

S. No.	*Name of PIP*	*Total Water Bodies Identified (April 2018)*
1	Churchu	43
2	Murhu	97
3	Jama-1	88
4	Jama-2	66
5	Palojori	185
6	Dhalbhumgarh	102
7	Tundi	50
	Total:	**631**

entrepreneurs and encouraged them to import good-quality breeds and raise them to combat these issues. These entrepreneurs provided health care to these purebred goats, taking care of their nutrition and mating them to increase their numbers. They also had to promote and market the breeds to the farmers in their villages.

In Jharkhand, the major intervention by the CInI team was introducing TND breeds (Jharsukh breed) of pigs to farming households. This was a hybrid between Tamworth and desi pigs with good adaptability and a relatively better feed-to-meat conversion ratio. CInI covered more than 739 households which received 2- to 4-month-old hybrid piglets at around Rs. 2,000–2,500 ($26.99–$33.74). Another advantage of the hybrid breeds was that they could be both used as breeders and sold for their meat.

The CInI team also conducted various rounds of discussion with the farmers and village-level institutions and carried out several awareness programmes concerning vaccinations and teeth cutting of the piglets. The service providers were trained simultaneously for the vaccination purpose and then provided their services for a minimal amount. Even the purchase of piglets was made in the presence of LSP, a livestock coordinator, and community persons as part of exposure to the community on understanding the management practices, breed identification and feed requirements. As per the intervention, a pig was to be vaccinated for foot-and-mouth disease of goats (FMDG) and swine fever twice a year. These interventions led to a steep decline in the mortality rate of the pigs in the area. The decline in the mortality rate could be directly linked to the continuous rise in the number of households practising pig rearing, which is around 1,522 households at present.

5.3.7 Introducing a Buck Improvement Programme or AI to Maintain the Breed Quality

CInI explored the possibility of artificial insemination (AI) with technology partners to address the challenge of quality breeding in Black Bengal goats.

AI as a service through the livestock entrepreneurs was promoted to maintain the Black Bengal breed by addressing the kidding percentage and weight of the goats, which resulted in a better return to the households. The AI providers received their training and tools from Agipan. This was a relatively new intervention and has not been applied to many clusters. This initial phase yielded an 80% success rate in artificial insemination. *Pashu Sakhis* charged Rs. 70 ($0.94) per AI, which was quite affordable for farmers. The intervention was also tried out for goats, and these services were provided by goat entrepreneurs such as Sukumar (Box 5.3).

Box 5.3 Sukumar Mandal

Sukumar Mandal, hailing from the Chickania village of Jama Block, had a family history of being involved in farming and livestock rearing. However, this could never generate enough income for him and his family. Being ambitious and hard-working, he grabbed the opportunity to become a "Goat Entrepreneur" in 2021.

While rearing animals has been a family occupation for him, he improved his skills by attending training sessions organised by CInI on different services involved in the goat health care value chain, such as "deworming, castration, artificial insemination or AI" among others. He invested 2.50 lakhs and took a loan of 40,000 rupees to start with 6–8 goats. Sukumar provides the same goat health care services described above to 500 households.

He is also involved in organising awareness campaigns with villagers to promote proper health care and treatment of goats for better longevity and productivity of the animals. He has been able to repay 10% of his loan amount, and his expected income annually is around 90,000. He hopes to scale his services with 500 households to secure a better life for his family through continued perseverance and hard work.

5.3.8 Provision of Insurance Schemes

Another important step towards encouraging farmers to venture into goat rearing was the introduction of goat insurance. CInI brought forth this concept to assure the farmers that their loss due to unforeseen circumstances would be reimbursed, and they would not suffer any loss. The insured animals were covered against death by diseases contracted or occurring during the policy period and against accident, including fire, lightning, flood, inundation, storm, hurricane, earthquake, cyclone, tornado, tempest, and famine. However, CInI is still testing this intervention and has not launched it in all the clusters.

5.3.9 Fishery

The fishery was a relatively new livestock prototype introduced by CInI to supplement farmers' income. CInI saw the opportunity for fishery in some clusters of Jharkhand. Over 758 households across these clusters were involved. CInI started the fishery livestock prototype through constant encouragement and support to help farmers reach the lakhpati mark. However, the initiative had its share of problems. The foremost was the practice of fish capture. CInI's role in this area was driven by the idea of a paradigm shift from "fish capture" to "fish culture". CInI provided training to prospective fish farmers to inculcate the fish culture ideology. The awareness and sensitisation programmes helped farmers understand the long-term benefits of rearing fish rather than simply capturing fish when required. Furthermore, successful fish rearing would provide for the village and increase the farmers' incomes.

CInI saw great potential in these clusters for fish cultivation. Considering the water resources in Jharkhand, a primary level survey was conducted by CInI, which showed a good number of water bodies available in the working area. The summary of total water bodies is given in Table 5.4.

The average size of water bodies is 23 to 25 decimal (0.23 to 0.25 acres), having the potential to produce 450 kg to 550 kg of fish. Due to a lack of knowledge about pond management practices and timely input supply related to fisheries, farmers were unable to utilise water bodies up to an optimum level. This leads to lower productivity and smaller income at the household level.

Yet improper practices did not yield desired results. The farmers were unaware of proper pond management practices, and poor marketing strategies affected business. With the help of local institutions like the farmer producer companies, CInI trained farmers in selecting an ideal location for fish rearing, pond management, providing nutritious food to the fish, and promoting and selling their fingerlings/yearlings/full-grown fish. In addition, CInI also appointed fish service providers who helped the farmers during times of distress and helped them successfully rear fish. CInI also included the farmers in every step of the value chain supply to ensure better results, build the farmers' capacity, and increase the community's resilience by reducing its dependence on CInI.

5.3.9.1 Major Activities under Fisheries Initiative

1. Farmer training on pond management practices.
2. Farmer exposure visit.
3. Fish seed nursery to meet the demand for seed in the local area through entrepreneurs.

4. Collective purchase of inputs.
5. Collective fish marketing.

Despite these interventions, a problem affected the growth and production of fish: the poor quality of fingerlings. CInI noticed that the poor quality of local fingerlings posed a huge problem. Thus, the dependence on good-quality fingerlings from West Bengal increased. Yet importing fingerlings was not a feasible option. This led to the conception of fish entrepreneurship in these clusters. CInI decided that instead of importing fingerlings, a few selected farmers with small ponds could import spawns. These villagers then became fish entrepreneurs who raised the spawns until they became fingerlings and sold them to farmers in their village for fish cultivation (Box 5.4).

Box 5.4 Stephen Sanga: The Fish Entrepreneur of Jharkhand

Stephen Sanga is a 28-year-old from the Chata village of the Murhu block of Jharkhand. He is a "Fish Entrepreneur", a farmer, and a commerce graduate student from the Murhu block of Jharkhand. His ambition and interest in becoming a self-sustaining businessman led to his selection for the technical training required for the fish business provided by CInI. Initially, it was quite difficult for him to grasp the tricky concepts of pond preparation and care and maintenance of the fingerlings and spawns, and to get his investment amount in place. He persevered and not only gained technical expertise but also went on to manage both his studies and work quite well. Stephen invested 40,000 rupees and currently owns one pond and another on lease. He can earn around 1.5 lakhs annually from the sale of fingerlings to 214 households and through training other fish farmers on their maintenance. Stephen likes the stability and flexibility this business provides him as the rates and demand do not vary a lot, and the time investment is limited once the technique has been mastered, giving him ample time to pursue other income-generating activities.

Fishery remains an excellent opportunity for farmers and CInI to explore. However, due to the lack of individual ownership of ponds, the profits earned per household are divided. Thus, it remains an out-of-reach goldmine. CInI has, therefore, shifted its focus from fishery in Jharkhand to piggeries.

5.4 Discussion

The essence of the programme lies in the fact that it understood the socio-economic conditions that the target households lived in. Although access to irrigation and the introduction of high-value crops increased the income

of target farmers, it seemed insufficient to make them "lakhpati" with the patch of cultivable land these smallholder farmers held. Recent studies have pointed out the positive impact of livestock rearing in reducing poverty if not completely moving the marginalised farmers out of poverty (Bijla, 2018). Livelihood diversification has been advocated by academicians and governments alike for the smallholders in which livestock rearing had the maximum potential. Gowane et al. (2019) highlighted that Indian states had framed respective breeding policies, but the priority given to the species was based on their perceived economic value. However, the limited outreach of breeding programmes and poor market linkages for small ruminants discouraged the farmers from seeing greater profitability and focusing on "breeding objectives like improvement in the growth rate" (Gowane et al., 2019).

The white revolution helped many farmers yet remained confined to specific regions. It did not extend to a large section of smallholder farmers in the interior/remote regions of the country because of the capital-intensive setup. The success in milk production in India was attributed to market linkages. It was far from reaching its maximum potential in terms of productivity compared to the world average (Ali, 2007). In this regard, LKP focused on market linkages and providing good breed cattle to the farmers to maximise productivity. Since cattle require a comparatively higher initial investment, it was introduced only to those clusters which could capitalise on the availability of a good credit system.

CInI has, on the other hand, also focused on less capital-intensive solutions for optimising livestock-related income in the tribal regions. The Indian Veterinary Practitioners' Register mentioned the large gap in manpower employed in the veterinary field against the current requirement of the population (Gowane et al., 2019). In this regard, CInI attempted to create and train a workforce that could provide year-round health care services to farmers concerning a diverse sect of livestock – goats, cattle, poultry, pigs, and fish – at a very low price. This step proved crucial in overcoming this barrier of manpower from the government side as service providers were promoted to give vaccination and deworming services to the remotest of the region. On the other hand, these service providers were local, so the community moved towards a self-sustainable demand and supply system of various services.

Layering other agriculture-related activities seemed the most effective way of increasing their income. However, doing so requires the creation of an ecosystem of services that could self-sustain after the initial years of support to the farmers. The major takeaways from the five-year journey of CInI in the area of livestock rearing are as follows.

5.4.1 Opening New Avenues for Increasing Farmers' Income

Due to the local communities' good response, CInI recently introduced backyard poultry as a livestock prototype in Odisha. Earlier, it used to be one of the most neglected livelihood options among the tribes in this region. Still, the active interventions by CInI continue to change the viewpoint and outlook of farmers on the "desi breed" hen and rooster. The introduction of backyard poultry was the prime example of how CInI worked and employed demand-driven innovative ideas after discussing and understanding the limitations and strengths of the community. Backyard poultry was taken up by CInI more seriously in the next phase of LKP.

5.4.2 Community-Led and Community-Centric Approach

CInI included community-centred approaches as one of its core principles, as discussions with communities help organisations better understand their aspirations and problems. It was the major reason the team introduced diverse livestock prototypes. The better market linkages and chances to get loans resulted in cattle promotion in Gujarat. It might not have proven successful if introduced in other states because the conditions vary with geographies and households. Similarly, piggery was limited to Jharkhand, as many tribal families had traditionally reared pigs, and the clusters had a high demand for pig meat. It was due to the focused group discussions that the reason behind some farmers' reluctance to adopt goat-rearing practices was identified in Orissa.

Prima facie, the reason might appear to be financial, but it was the absence of dedicated people to look after goats solely that was the problem. As a result, CInI changed the plan and came up with backyard poultry to solve the above problem in Orissa. It was one of the most common yet neglected livelihood opportunities in the tribal communities. Similarly, various models for goat rearing were introduced and extended to support the farmers who had traditionally been dependent on rainfed agriculture and saw livestock as nothing more than insurance during needful times.

All of this reflected the larger literature, which talked about the involvement of target communities, the stakeholders, in both the planning and implementing stages. Community engagement in the planning stage also helped CInI create a system where SHGs did the planning and monitored their members, and VOs monitored them. This ensured the irreversibility of the progress made by communities in the long run.

5.4.3 Training the Communities and Service Providers for an Irreversible Change

The baseline surveys by CInI regarding the livestock mortality rate were in cognisance of the work of other organisations like PRADAN. Most tribal farmers lived in remote areas where health care services didn't reach and which witnessed huge losses from seasonal/yearly outbreaks of diseases like foot and mouth. When CInI realised that the mortality rate of livestock could be reduced to a great degree if proper vaccinations and other health care services were provided, it worked towards a solution for the inclusion of the remote tribal villages. Veterinary access for the small ruminants was comparatively poorer than that for cattle, reflected in the high mortality rate (Sindhu et al., 2019; Gowane et al., 2019). The best solution that it came up with was training some individuals from the community who could provide vaccination and medicinal services to the livestock. They were called service providers or "*pashu sakhi*" and played an important role in livestock intervention.

Although the service providers were paid a stipend for a few months even after their training, they were also asked to collect money for their services from the farmers. Since the service charges were kept very low (at around Rs. 2 per dose), the farmers also developed a habit of paying for their services. This helped create an ecosystem where the service providers and farmers interact and earn profits. On the other hand, the irreversibility of any initiative could be ensured only after bringing about behavioural changes in the stakeholders. The awareness programmes led by CInI enabled a behavioural change where farmers became aware of the benefits of vaccinations and actively engaged and looked forward to procuring timely services from service providers and entrepreneurs.

5.4.4 Extending Credit Models: A Shift from Grants to Loans

The smallholder farmers come from weaker sections of society. CInI realised this and made credit models for every livestock prototype – goat rearing, cattle, pig rearing, fishery, and backyard poultry. In the initial years, there was more reliance on grants to motivate farmers to invest their time and money in livestock rearing. Slowly, the shift was seen from grants to loan models as repayment of loans helped monitor the farmers' performance. It must be highlighted that the success of cattle rearing in Gujarat was not only because of its superior market linkages but also because of the availability of investors with low-interest loans. However, the gap between the demand for dairy services and the loan opportunities for farmers increased over the years. The government must make loan policies for procuring cattle favourable to relatively poorer farmers.

5.5 Summary and Conclusion

The livestock rearing initiative started as an allied agriculture activity layered with crop cultivation towards reaching the Lakhpati pathway and managing the risks for smallholders. The tribal households had small ruminants, and thus, building on the livelihood layering, the focus was to see how livestock could be an important livelihood source. The livestock was also focused intensively on families with very small land parcels who could not take the risk of high-value agriculture. This intervention may not have been a core component of the blueprint model initially, but its success at the grassroots level made it easier to integrate it with the model's approach.

Livestock rearing emerged as a practical solution for the barriers faced during the implementation process of the Lakhpati Kisan Mission. Hence, it required extensive research and analysis before it could be completely trusted. With extensive action research into identifying which livestock would work best for different regions and the other interventions required to boost productivity, this outline was tailored to suit each state's topography, geography, and climate to ensure the animals thrived in these regions.

CInI identified the kind of animal that would survive best in different clusters, feed and fodder, reliable and well-ventilated shelter, availability of veterinary experts in the vicinity, network with buyers and vendors, financial aid to assist in the purchase of animals, knowledge support about animal rearing, etc. Village-level institutions and self-help groups began engaging people in pashu melas and health camps to increase awareness about livestock rearing, its benefits, and improved methodologies to carry it out.

With people increasingly showing their courage to venture into this initiative, CInI, in collaboration with a few other organisations, began guiding the communities towards profitable animal rearing. They connected farmers to vendors to purchase improved breeds of animals, with financial help such as loans being made available through the collective efforts of federations and communities.

When the financial hitch was overcome, the animal shelters and feed improved with proper shed construction, fodder and nutrient supplementation, vaccination and deworming, regular health check-ups, etc. Livestock entrepreneurs were appointed as contact points for the primary health care of animals, which also empowered women to take up crucial roles within the community. The CInI team connected the farmers with vendors, buyers, and dairy systems to assist in fair trade in the market so that farmers could receive good prices for their production. Collective marketing under the guidance of federations, FPOs, and village organisations reduced transport and storage costs of the product and helped this initiative thrive. Creating market linkages and a service delivery system helped establish a concrete

value chain system, helping establish irreversible and sustainable phenomena that increased incomes and transformed perspectives and lives.

While this chapter shows how farmers' income increased by employing multiple livelihood prototypes, the changes in these clusters go beyond just a hike in their incomes. There has been a tremendous change in the capacity of the villagers.

Nirmalaben (Box 5.5) of Dahod district in Gujarat shared how difficult her life was before CInI's approach. Men used to migrate to cities like Ahmedabad and Baroda for jobs, leaving women behind to work on the farm for a paltry income. The animals reared by the villagers did not generate any income, and it was difficult to break even. She and her husband had to face bigger problems as they weren't completely able. However, after getting involved with CInI, the gates to a better life opened. She got involved with SHGs, started taking initiative, and wanted to bring about a change in her life. She also saw a great boost in income following CInI's training. From a woman who owned just two cows, she has become a dairy farmer and a proud goat entrepreneur. She has also noticed an overall change in the villagers. She shared that men do not migrate, and the family is complete. People have built pucca houses, and they send their children to school.

Box 5.5 Nirmalaben Bariya: Breaking the Cycle of Poverty through Agriculture and Determination

Nirmalaben Bariya is a differently abled tribal farmer who resides in the Goriya village of Dahod district in Gujarat. She lives in a joint family with her differently abled husband, Sureshbhai Bariya, 2 children, and 14 other family members. After graduating from college, Nirmalaben got married in 2011, and her husband was unemployed as being differently abled himself made it difficult to gain employment. Even when Sureshbhai found work as a daily wage labourer in the nearby forest, he earned just about enough money to afford two square meals. In 2014, they moved to Ahmedabad in the hope of better opportunities. They found soft labour work at construction sites, but the pay wasn't sufficient. With barely enough financial resources to meet their needs, they found themselves trapped in the cycle of moneylenders who levied high interest rates.

In 2015, Nirmalaben joined the "Mission 2020 – Lakhpati Kisan: Smart Villages" programme. At that time, she owned one acre of ancestral land used for traditional, rain-dependent mono-cropping. After participating in many capacity-building activities, she acquired the knowledge to maximise income from farming, improve skill sets, and learn scientific farming practices for high-value crops. She was supported in incorporating techniques such as maintaining crop geometry, intercropping, split nutrition management, pest management, timely irrigation, etc. As a result, her earnings were Rs. 65,000

during the kharif season from maize, pigeon pea, and vegetables, and Rs. 78,000 during the rabi season from gram, ginger, and turmeric.

She also diversified into dairy farming to reduce risks and earn additional income. During the exposure visit, she visited Panchmahal Dairy, where she met progressive dairy entrepreneurs and acquired the necessary skills and knowledge. She then took a loan of Rs. 60,000 from the apex institution to purchase a buffalo for dairy farming. In the first year of practising dairy farming, she earned Rs. 28,000. With improved dairy and agri-market linkages, she became a "Lakhpati Kisan" with an annual income of Rs. 1.71 lakhs.

She invested part of her increased income in deepening wells and building a tube well. During the successive kharif and rabi seasons, her income was Rs. 75,000 and Rs. 87,000, respectively. She bought one more buffalo. With a consistent rise in her earnings, her income in the third year was Rs. 2.5 lakhs. Nirmalaben has successfully carved a way out of poverty despite her physical limitations. She has nurtured the local entrepreneurial spirit by persuading 30 other farmers to participate in similar loan-based initiatives and purchase dairy cattle. Nirmalaben has evolved as a motivational leader who has demonstrated the success of the "Lakhpati Kisan" model for herself and the whole community.

CInI has also busted the myth of employing advanced technology to raise farmers' income. CInI is an exemplary model that shows that using local goods can go a long way. CInI has also promoted micro-entrepreneurship at the village level. Instead of depending on other states for better goats/pigs/fish/cattle breeds, villagers turn to entrepreneurs in their villages. This has generated livelihood options for the villagers and built their capacity as individual and community thinkers. Women of the village form VOs and FPCs and confidently tackle business and the market.

One of the didis in Jharkhand summarises CInI's work in this area, "Pehle hum bahut dara karte the ki yeh hum kaise hoga. Par CInI ki taleem se aaj humne yeh badlaav dekhe hai. Ab hum sashakt ho gye hai!" [Earlier, we were scared to try more things. We used to think about how we would be able to do it. But after CInI's education, we have seen a lot of changes. We have become confident now!].

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6

WOMEN'S EMPOWERMENT AND EQUITY

Building Social Resilience through Women-Led Community Institutions

Ganesh Neelam, Mala Roy, Yamini and Aditi B. Prasad

6.1 Introduction

> Before joining these interventions and groups, I was my husband's wife. Now when I step out of the home, people of the village and panchayat know me for my work. They stop by and greet me – "Johar Didi".
>
> *(Bulu Didi, Jugisol village, Sidhesol Panchayat, Dhalbumgarh block, Jharkhand)*

In an ideal world, women would lead their families and society just as men do. The stark difference between the perfect scenario and our current world seems unbelievable. There is still a stigma attached to the idea of women leaders, which is especially evident in the Indian situation. Although there are some great role models, the overall perception of women leaders is that they are weak, less capable than men, and incapable of making tough decisions. Rural women primarily work in the agricultural sector. However, many research studies show that women barely own land in their name (Rao, 2011; Agarwal et al., 2021). They are involved in managing farms, but men are the main decision-makers.

Rural women are also concentrated in small and marginal farming and wage labour occupations. They have little access to irrigation and technological know-how. As land in rural areas is controlled mostly by men, women farmers have little say in distributing land to male farmers (Das, 2014). It is not uncommon for women to be paid less than half of men's wages and for men to have several acres of land (Agarwal, 2003; Glazebrook et al., 2020).

Women are key players in agriculture. They do most of the farm work. They are an essential part of agriculture, along with the role of men

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(Majumder & Shah, 2017). The role of women in agriculture in India has traditionally been limited to the functions of farming (crops, livestock, and water resource management) and, to a lesser extent, to domestic duties such as washing clothes, fetching water, and cooking. Men have traditionally been active in leadership roles. This was visible in the 17 LKP clusters in Odisha, Maharashtra, Jharkhand, and Gujarat; women had minimal decision-making power, were underrepresented in leadership roles, and were strangled in the vicious cycle of poverty.

Collectives for Integrated Livelihood Initiatives (CInI) worked with small and marginal farm holders through the women members in the family to take them out of poverty and meet their aspirations irreversibly. The aim was to engage women by making them and their households financially independent and taking them toward gender resilience in the community (CInI, 2021). Moreover, the capacity building of women empowered them to anchor decisions within the household and their groups, have better bargaining power, and promote the sustainability of the household. By involving women and the community, CInI worked towards women's economic empowerment in agriculture and the holistic development of the community. LKP built women's capacities, skills, knowledge, and leadership qualities. Access to financial and institutional support played a collective role in uplifting the community's position. Women in agriculture contributed to the rural economy, themselves, their families, and the community.

Institutions such as farmers' produce organisations, gram panchayats, entrepreneurs, and self-help groups increased women's representation and decision-making within the villages and clusters in leadership roles. CInI helped improve their involvement in the market value chain, which also positively impacted their capabilities. LKP developed the rural economy by strengthening the existing institutions by adopting a women-centric approach and focusing on livelihood for strengthening institutions such as the community (CInI, 2019; CInI, 2021). The involvement of women in the programme also helped them realise their aspirations of providing a good education for their children, having monthly savings, and starting their enterprise or business in agriculture. Women's leadership skills were also strengthened while leading self-help groups (SHGs) or dialoguing with stakeholders. This woman-led space played an effective role in capacity building, network building, and creating support systems for women, as well as decision-making for income and community development growth. Women were catalysts for the sustainable development of the community. This mainstreaming of gender in the agricultural sector brought equality between men and women with a sustainable future. The collectivisation of communities was not only beneficial for the women but also for overall development. Community membership could provide individuals with economic support (jobs, credit, other economic help in crisis), social support

(during illness, etc.), and political support (in conflicts), which were denied to non-members (Agarwal, 1995).

The chapter sheds light on the programme design of LKP from a gender perspective. It emphasises the need to keep women at the forefront of the programme to lead the action through their institutional structures. This chapter is divided into five sections. Section 6.2 discusses the problems faced by women, the programme implementers in the field, and the field-level interventions sought to address those issues. The next section highlights the engagement mechanisms adopted by the women's group and the CInI team members, giving them a capacity-building platform. The next section discusses the role of men, institutions, and the community in supporting women to meet their aspirations and creating a vibrant ecosystem. In the last section, the chapter is summarised with the conclusion.

6.2 Problems

According to the *United Nations Convention on the Elimination of All Forms of Discrimination against Women*, tribal women, as a practice, have rights. These include the right to have equal access to all economic resources, the right to inherit property, the right to freedom of movement, and the right to make decisions regarding family matters such as birth and death. The Constitution of India has guaranteed these rights. Yet, they have not been fully utilised by tribal women due to the lack of awareness of these rights, domination by their male counterparts, the denial of their use, caste, and gender-based discrimination. Tribal women in India seldom own land and agricultural resources as, traditionally, the lands have moved through male heirs. A study by the Food and Agricultural Organization of the United Nations, the International Fund for Agricultural Development, and the International Labour Office (2010) proved women bore the maximum workload linked to agriculture and allied livelihoods, even though they did not own land. Land ownership and making key decisions on their livelihoods were important factors in women's empowerment.

Women were denied decision-making power, asset ownership, and access to loans required to engage in livelihood activities. Small businesses require such loans to get started. Under such constraints, women could not secure stable livelihoods and income streams and relied on men for their financial needs. To make ends meet, women were sometimes trafficked to cities for domestic work, worsening the domestic situation. Health and nutrition-wise, women faced considerable challenges and, in most cases, lost their lives.

A study undertaken by *Azim Premji University* on *Farmer Producer Companies – Past, Present, and Future* in 2020 states that

> As of March 31, 2019, 7374 producer companies are covering over 4.3 million small producers in the country. These numbers are expected to

> more than double over the next few years, covering almost 10% of all agricultural households in India. And only 3% of women members.
>
> *(Govil, R., Neti, A., & Rao, M. R. 2020, March)*

LKP framed the foremost principle as women-led communication, which means that the livelihoods are implemented through women and their institutional structures, along with empowering, exposing, and building their capabilities to focus on the following.

6.2.1 Unrecognised in Ownership and Lack of Representation of Women in Leadership

Women contributed nearly 80% of their time and energy to farming but lacked the power to make decisions and did not earn much from agriculture. Thus, on their farmlands, they worked as labourers.

6.2.2 Lack of Holistic Development: Of Women, Their Families, and the Community

Development was not restricted to financial development but the holistic development of the community. Tribal communities were involved in earning their living but lacked proper health, education, water and sanitation facilities, livelihoods, sports, digital literacy, and affordable energy. This hampered progress towards sustainable development.

LKP helped women rise from cutting "*Dhaan*" to a larger space where dialogue between women and other stakeholders happens. These stakeholders included the District Magistrate (DM), members of the Panchayati Raj System, federations, etc. Women became more involved and got opportunities for effective participation in the three-tier structure of panchayat, federations, and other male-dominated spaces. This helped make people, especially women, empowered and decision-makers, building leadership qualities, involvement, and women's negotiations in the value chain. LKP's efforts for a women-centric approach helped strengthen institutions, engage families, and empower them holistically in terms of personal and community growth.

6.3 Approaches Adopted by CInI along with Women Leaders

This equal participation and representation resulted in inclusive and developed societies. Women-led institutions took responsibility for the family and extended advantages to the children and other family members. The collectivisation of women helped create unity, wealth, and social capital in the tribal communities, where their culture was connected to nature. Involving

women in agricultural development (in particular, as extension agents) and women's empowerment was important because it affected the level of agricultural productivity and the health of farmers, as well as the quality and quantity of their families' diets (Njuki et al. 2019 and Raghunathan et al, 2019)

While designing LKP, CInI spent nearly four to six months dialoguing with the SHGs to build a design that would meet women's and their families' aspirations. Intensive discussions with women leaders and exposure to other states like Rajasthan and Tamil Nadu, where women leaders had led their development and growth, helped articulate the aspirational goal of making families lakhpatis. This approach ensured a sense of ownership and pride among the women and their families to join and lead the programme.

Bringing women into leadership positions helped in achieving gender equality. "*Lead Didis*", often early adopters and changemakers, understood the programme and served as influencers. Various initiatives and approaches designed by CInI involved SHGs and field interventions like Urja and exposure visits, which will be discussed later in the chapter focusing on working with emerging women leaders. LKP helped women take on allied livelihoods such as lac cultivation and goat rearing. Many women from SHGs were part of the livelihood mission, where they tried to connect, influence, and motivate other women to get involved.

CInI encouraged women to head various sectors like health, digitalisation, education, and agriculture. In addition to the livelihood programme, women from SHGs and federations from each area were trained on using the internet; these were "*Internet Sakhi*". They created awareness and conducted training sessions on livelihood, health, education, etc. When people involved in animal husbandry fell sick, their cattle were looked after by "*Pashu Sakhi*", who were community-based resource persons. They were trained on artificial insemination and delivery; this provided extra income and associated them with the medical field.

6.3.1 Programme Design Revolved around Women and Institutions

CInI took a bottom-up approach to inclusivity in tribal households and communities. The approach included women at every programme step and helped build their decision-making ability for agriculture and agri-businesses. Women-led and, by extension, community-led initiatives were the programme's focus. Women's involvement in market activities gave them a greater say regarding their input in all aspects of household decision-making (Acharya & Bennett, 1983). LKP's vision and mission were to empower rural and tribal women to lead the programmes. The participants in workshops such as "URJA" also learnt skills to identify and map issues in the village. The training helped participants understand and map the diverse

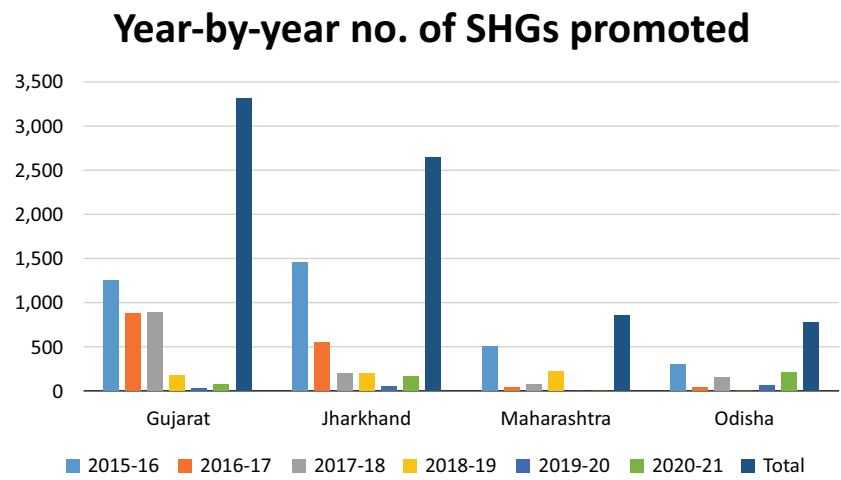

FIGURE 6.1 Number of Self-Help Groups Promoted from 2015 to 2021 and State-Wise.

livelihood options of the women and formulate livelihood maps. Livelihood prospects were created with the help of local institutions such as SHGs. Figure 6.1 shows the number of SHGs promoted from 2015 to 2021 in the location of work.

LKP developed a network of community resources, created a platform for rural women to discuss their issues, and supported the women. CInI took a deep look at women's issues and built up a rich understanding of the community context, vital for the programme's success. As is evident in Figure 6.1, several SHGs were introduced in the clusters when LKP started. Currently, Jharkhand has the highest number of SHGs, followed by Gujarat, Maharashtra, and Odisha. After 2017–2018, the number of SHGs across all the states has steadily increased. More SHGs helped spread mutual support across the area for fulfilling the dreams of women and families. While promoting the SHGs, a conscious step to engage closely with the National Rural Livelihood Mission focuses on promoting SHGs at scale. Thus, rather than duplicating efforts, LKP capacitated and linked the existing groups to LKP. It pulled families out of a vicious cycle of poverty, which was visible in the case of Sumitraben from Dahod (Box 6.1).

Box 6.1 Sumitraben Dalsinhbhai Patel, Dhabada Village, Limkheda Taluka, Dahod, Gujarat

Sumitraben Dalsinhbhai Patel of Dhabada village, Gujarat, once fully relied on daily-wage labour. Her family occasionally harvested maize and red gram

on her 2.5 acres of unirrigated land throughout the kharif and rabi seasons, respectively, as the only, but insufficient, method to make ends meet. With the implementation of LKP, Sumitraben joined the Mahalaxmi self-help group, which helped her have regular savings and internal lending of loans among the group members. Sumitraben utilised Rs. 25,000 of her savings from selling vegetables. At the same time, the Mahalaxmi SHG provided a loan of Rs. 10,000 to her for installing a tube well, which cost Rs. 35,000, to grow high-value vegetables and sell surplus irrigation water to the neighbouring farmers. In the second year, further credit support enhanced the irrigation potential and increased the area under high-value crops. Sumitraben's family's food security improved by cultivating cereals such as maize, paddy, and red gram. This was possible due to Sumitraben's training and exposure and the extension support by CInI and Tata Trusts. Her confidence in diversifying to other industries, such as dairy and microenterprise activities, grew as she adopted scientific methods of practising agriculture, notably the cultivation of creeper vegetables and spice crops using a trellis system. With the help of federation loan model initiatives, she started a dairy and purchased a better kind of milch animal. These activities and the support of CInI helped her to become financially independent and achieve a wage increase of Rs. 3 lakhs. Sumitraben earned respect and became an exemplary leader and a motivation for the 300 women of Dhabada village. Sumitra Ben was a role model for changing the traditional power balance and breaking the vicious cycle of poverty.

6.3.2 Engagement Mechanism

LKP looks at taking the tribal population irreversibly out of poverty with the help of allied agricultural livelihoods and overall ecosystem development to be led by women. As the project worked with women, the efforts were towards innovatively capacitating and exposing them to various developmental dimensions. For their holistic development, many skill-building workshops, training sessions, awareness generation sessions on social issues such as gender-based issues, and exposure visits to various locations are held with the help of various village organisations, SHGs, farmer federations, and CInI's initiative. Many interventions were taken up with the help of behaviour change communication, education and entertainment games, interactions, and role play by CInI and other implementation partners. The engagement mechanisms were a dialoguing platform, Panchayat Exit Plan, exposure visits, gender sensitisation workshops, and menstrual hygiene management.

6.3.3 A Platform for Dialoguing

This was a platform where, in addition to providing space for dialogue, meetings allowed space to share experiences and learn from other women in the agricultural value chains. This workshop was named after the areas like *Medawa* in Maharashtra, *Samvad* in Jharkhand, and *Urja* in Odisha. In this workshop, facilitators supported the participants in developing an agriculture awareness workshop on the value chain of fresh produce, new livelihood prototypes (including vegetable cultivation, livestock rearing, etc.), the idea of change or "*barbarian*", and their vision of their village and community for 2020. The workshop focused on strengthening the role and quality of self-help groups in the community and discussions related to their community's roles, responsibilities, and aspirations.

One such discussion that happened at the event was regarding improving paddy cultivation. The shift in traditional agricultural techniques, the adoption of improved paddy and vegetable practices, a common nursery, and main field preparation allowed a greater yield to be obtained from agriculture, and revenue has increased line sowing paddy. This improved the farmers' income, which was used to improve children's health and education and was re-invested in agriculture and business.

6.3.4 Implementation in a Gram Panchayat through Independent Involvement of Women from the Federation

This workshop allowed women to work independently in Panchayat without interference from the Implementation Support Agency (ISA). The motive of organising this workshop was to give women from FPO an opportunity to take over the responsibility of Gram Panchayat and work independently and make their own decisions. Not only this, but the objective of this workshop was to provide financial independence and help women to speak for themselves openly and fearlessly.

Women from the federation had space to speak their minds about their dream Panchayat and how to achieve it without any external support from the NGOs. The women discussed their aspirations and were inspired by each other to work together for themselves and the community; they wanted every household to be a Lakhpati Kisan, to educate their children, and to improve the infrastructure in the villages.

During this workshop, women understood the importance of planning, the concept of risk, the reason for layering, and the importance of finance; these aspects were discussed. The representatives of each group were responsible for making the kharif agriculture plan of their designated Gram Panchayat following the requirements of the Annual Work Plan. This exercise also helped them gain self-esteem and community engagement, reducing

their fear and hesitation. This showed that women were good at planning who was to assist every household; the involvement of these lead didis led to the revival of a few defunct SHGs. They evolved into leaders, and their confidence and decision-making abilities grew due to the increased responsibility. They helped serve farmers and federation CEOs and acted as coordinators. They could connect with the community and their needs. Goat farming was one of the most viable sources of revenue, so this prototype's success rate was high. It became easier to go to government officials like BDOs and talk to them. They gained new cognisance as leaders in Gram Panchayat, and a feeling of responsibility developed.

6.3.5 Exposure Visits

Exposure visits gave women farmers and entrepreneurs a platform to open up in other regions, to connect and learn from these visits, which allowed them to see the actual successful integration of sustainable practices in farming communities similar to their own. These visits had dual benefits. They empowered the women who witnessed other women working independently and confidently in other states and invoked ideas that could be replicated in their villages. They also built the trust and confidence of women, their husbands, and the community in the programme and its implementers. The initial hesitancy towards women's safety and their involvement in programmes cleared after women successfully returned to their villages from exposure visits and shared their learnings with their community. This was a bridge between these women and the community to motivate others to be part of the Lakhpati Kisan Initiative. This case study reflects their experience in an exposure visit.

An excellent example of the role of exposure visits and SHGs in transforming women and villages, along with the role of men, can be seen in the story of SAFE FPC, Gujarat (Box 6.2).

Box 6.2 Men's Support to Women Leaders of Sabar Aart Farmer Producer Enterprise SAFE Farmer Produce Company, Kheroj, Khedbrahma District, Gujarat

The Sabar Aart Farmer Producer Enterprise was associated with the village organisation (VO) named "VIKSAT" and CInI since 2010. This was started by a group of men and was handed over to women in 2017. The men of this FPC, such as Nandubhai Netabhai Makavana of Ratanpur village, actively support women. Like other FPCs, women leaders initially experienced backlash from men and the community, but the board members remained resilient and unstoppable. This was seen when they were not taken seriously despite being equally capable of working and handling agricultural business. They took charge of themselves

and began to understand everything from seed selection to product transportation. They were also involved in audit work and the formation of new SHGs, and now they have added around 6,000 farmers to their FPC. Men in this FPC believe women are better changemakers, trustworthy, think before acting, and care for the FPC just as they look after their families. Women became confident in speaking regardless of their educational status. Previously, they used to place a thumb on any official document, but now they can sign. The village organisation promoted women's empowerment, allowing them to participate in exposure visits and sightseeing, which gave them the confidence and independence to travel outside their community and encouraged other women to join the project. The support they received from their spouses and families changed; formerly, they faced obstacles, but now their husbands even send them to meetings and occasionally visit the centre to attend sessions. Women leaders are getting more support than before. From financial independence to being tribal woman leaders, their exposure and progress have been dynamic.

6.3.6 Gender Sensitisation Workshops

As a first step towards inclusivity, gender sensitisation workshops and field visits were conducted for the CInI personnel and the CInI partner organisations with women members of SHGs, federation members, and the board of directors of FPCs. The goal was to build a just society for both men and women by bringing in the gender perspective and gender mainstreaming within their ecosystems. There were a series of brainstorming activities and field visits to various FPCs. The discussions with women leaders were about the division of labour based on gender and women's responsibilities, women's identity, the role of women in the federation, and the future vision of FPCs. The impact women observed in their lives and within their households was the emerging new identity of themselves and increased mobility, where women were more visible in their communities, with increased negotiation power and say in the family.

The CInI team members created a safe space and non-judgemental environment, providing a conceptual understanding of gender, gender construction, myths and facts around sex and gender, and its implications. They addressed the issues of women's subordination, patriarchy, systems of domination and control, identity politics, and division of power (intersectional gender equality through power walk) and awareness of participants' biases. They identified some areas for change in their lives and workplace for gender equality. With the help of this workshop, participants opened up and understood different power structures, gender differences, and societal

discrimination. It helped in unlearning biases and working for women-led communities and their holistic development.

6.3.7 Menstrual Hygiene Awareness

It was observed that a lack of information, infrastructure, and economy caused women to drop out of schools, workspaces, and other public spaces. The lack of information caused major health-related issues and hindered their personal and professional lives. This is where menstrual health education was required. CInI identified this issue and tried to create awareness with the help of Community Resource Persons (CRPs).

CInI assisted in the organisation of a "Swasth Mela", in which a community resource person, also known as a "Sakhi" or an MHM Trainer, raised awareness about menstrual hygiene and debunked the myths of menstruation. This initiative of "*Sakhi*" showed women were becoming changemakers and taking up leadership positions. CRPs adopted a behaviour change communication strategy by addressing safe and healthy habits, menstrual waste management, various products to be used, and stereotypes and superstitions related to menstruation. Through such workshops, problems were discussed, such as harmful practices adopted due to lack of information, pure vs impure, the right product to use, etc. These workshops talked about MHM but also tried to address the issues through couple counselling, adolescent boys' and girls' sensitisation, sustainable options for pads, and innovative waste management solutions.

Many engaging activities helped women bust the myths and taboos attached to menstruation, such as the "impurity" associated with menstruation and stereotypes, by being part of science and technology, which was always considered male-dominated. This improved women's participation and contributed to the holistic development of society. Ujjwala Tai of Dhadgaon Village in Maharashtra was one of them: "I started rethinking about all that we have been taught as women about menstruation. I'm relieved to see so much of it was just myths. I've moved past them, and I hope more people do too".

6.4 Discussions

CInI's approach to women-led initiatives and institutions gave good results along with learnings, which continue to be part of the overall institutional journey. LKP gave women the centre stage in the programme, with CInI's support. Field-level interventions such as URJA and the involvement of women in apex institutions, including FPCs and VOs, profoundly impacted women, their families, and the community. Following the National Rural

Livelihoods Mission (NRLM) model, CInI successfully introduced women to leadership positions and empowered them to make decisions.

As the LKP focuses on Self Help Groups and overall women empowerment, it has also enabled the women members in the group to systematically take up the saving and lending process. The loans within the groups as well as from financial institutions are being mobilised for livelihoods and education. The savings among the groups have also increased with the rise in incomes. Overall, through the LKP, the ability of women members to make decisions linked to finances and areas of investment has been fairly high. The households moving to the Lakhpati pathway are investing the increased income in areas such as livelihood assets, education for children, vehicle purchases (scooty), sanitation units, etc. The trend shows the increase in income in most cases being for a positive need at the family level, with women having a stake in decisions.

The SHGs, being the base institutions for the programme, have been leveraged through the existing government programmes, such as the National Rural Livelihood Mission, as well as promoting new SHGs within the hamlets/villages. The learnings of SHG promotion have shown that considerable efforts on capability enhancement for savings, lending, financial literacy, livelihood linkages, etc., are very important and unfortunately there are limited engagements on these. The leadership within the groups and group dynamism are critical to a focus on building sustainable institutions.

Over the years, the programme saw women transform into confident individuals, leaders, and community resource persons. Women-led SHGs, FPCs, and VOs negotiate with Block Development Officers and confidently pitch for themselves in the Panchayat. However, the role of men throughout the programme became essential because of the partnership between men and women to maintain their livelihoods during COVID.

6.4.1 Role of Men

Involving men was a significant step towards moving beyond rigid gender relations and promoting inclusivity in agricultural leadership. Integrating women from the start of agricultural reform and involving men and women in needs assessments was critical for inclusivity. Every effort counted towards increasing women's participation in decision-making at all levels. Men helped increase women's inclusion in agriculture and opened doors to make people realise that inclusivity was not only a female trait.

Suma Devi and her husband, Kunjbihari Roy, are a perfect example. The smallholder farmer couple from Palajori, Jharkhand, changed the difficult low-income period of summer to a profitable season! The duo worked together in bringing changes to their field, including the adoption of agri-technologies like drip, mulch, and trellis, to grow high-value crops like gourds, tomatoes,

chillies, eggplants, etc., in the peak summer and sustain their income. This was a huge step from the usual couple dynamics on the field. With CInI's constant effort to include women and sensitise men, people have begun to lean on women more. The couple saw a 30% rise in their income by cultivating HVA crops at the right time. Now, men like Kunjbihari Roy proudly work with their wives and are on the path to becoming lakhpatis.

6.4.2 Role of Institutions

Focusing on community institutions, the National Rural Livelihood Mission (MoRD, 2014) strived to empower disadvantaged women farmers to increase participation, improve production, and pursue sustainable livelihoods via systematic investments in knowledge, skills, and capabilities. One of its subcomponents, Mahila Kisan Sashaktikaran Pariyojana (MKSP), aided women in SHGs in gaining access to resources and services for increased agricultural output. Such initiatives formed a federation of community institutions that mentored and supported units in their geographic areas to enhance local capability, such as SHGs and VOs (Singh et al., 2020).

In the past five years, CInI has ensured that around 100,000 families were part of a robust institutional structure led by women. SHG federations and secondary tiers (SHGs and VOs) were key institutions in the tribal households' development process. CInI and several other institutions made a significant effort to include women in livelihood ownership and leadership. They not only nurtured agents of change within the community, who were usually women, but also exposed women to several opportunities in the form of exposure visits to different states. Recently, 3ie conducted an impact evaluation of the National Rural Livelihoods Project (Kochar et al., 2020) in the states of Jharkhand, Odisha, Uttar Pradesh, Chhattisgarh, Madhya Pradesh, Maharashtra, and Rajasthan. According to the study, SHGs played a crucial role in women's financial inclusion and access to credit. Additionally, when SHGs were federated, their performance improved significantly. SHGs linked to a VO had greater financial access and usage of funds. Interestingly, however, SHGs and VOs did not affect women's decision-making within their families. This was in contrast to what was evident in the CInI clusters.

Women implemented an array of interventions in their villages, including ensuring the stabilisation of two livelihood activities at the household level, developing sustainable energy-based water resources and emphasising efficient water usage, nurturing entrepreneurial ventures by tribal farmers, introducing innovative and disruptive technologies for better returns, and strengthening market linkages to ensure fair value to farmers. These women showed tremendous decision-making capacity in their families and villages. Another study by the *World Bank*, focusing on the Self-Employed Women's Association's interventions (2014), discussed the SHG women's household

decision-making and civic engagement. Women in villages with SHG programmes were more likely to participate in group savings programmes, save money regularly, and have the final say in household decisions. It highlighted how important organisations like SHGs, VOs, and federations were in women's lives, particularly regarding decision-making and autonomy.

Furthermore, the financial support these institutions give women makes a world of difference. Efforts were made to develop and strengthen community-based institutions and enterprises by providing high-quality business and institution development services, establishing links to affordable finance and markets, and developing the vision, technical, and management capacities of staff and leaders of such institutions/enterprises (Desai & Joshi, 2014). In the CInI clusters, women learned to operate cooperatives, handle account books, audit self-help groups, and manage their bank accounts. With the interventions from these institutions, women went from being confined within the four walls of their houses to becoming public speakers at the state level. Women made decisions and managed their money. The once-anonymous woman became the face of the programme at the national level. One such case is the case of *Kalpana Didi* (Box 6.4).

Box 6.3 Kalpana Didi, Rautara village, Dhalbhumgarh Block, East Singhbhum, Jharkhand

Kalpana Hembram was a resident of a small village called Rautara in Dhalbhumgarh block in East Singhbhum, Jharkhand. The village had 340 households, which were mostly tribal and very poor. Kalpana didi's main source of income was agriculture, which did not create much profit. After joining the Federation of Dalma Mahila Mandal Sangh in 2012, she became the Federation Treasurer in 2016 and met CInI. She participated in several training programmes conducted by CInI and became a social motivator in her village panchayat. She aimed to give the villagers a good and hassle-free life. In addition to supporting the village, Kalpana didi empowered other women and encouraged village organisations to take charge and look after all the prime activities. Today, "Kalpana Di" is quite popular across her and neighbouring villages' panchayats.

The primary goal of SHGs was to bring the rural poor, particularly women, together in small groups so that they could pool their savings. However, it was important for these SHGs to tie up with banks and un-utilized funds to be kept in bank. The purpose is to take credit and do interlending at times of need. Initially, bank managers were quite reluctant to open an account for SHGs. Saraswati Didi from Odisha shares how bank managers opened bank

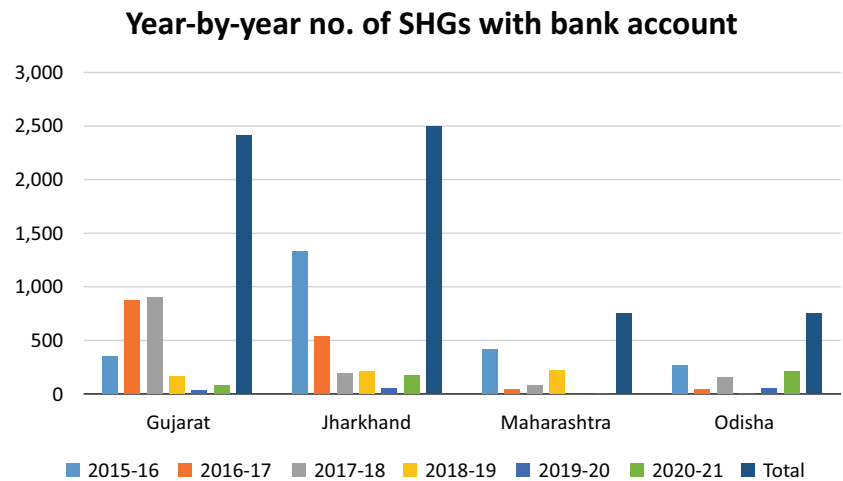

FIGURE 6.2 Number of Bank Accounts Linked with Self-Help Groups from 2015 to 2021.

accounts for SHGs after multiple protests and persuasion efforts. SHGs and banks have now built a strong relationship. "Now when bank managers come to visit the village, they always look for *didis* (women) and not *dadas* (men)", says Saraswati didi.

Figure 6.2 shows how the number of SHGs with bank accounts increased over the years. Jharkhand has the highest number of SHGs linked with banks (3,867), an increase from 3,709 SHGs in 2015–2016. Gujarat has the second-highest number of SHGs linked with banks. The number of SHGs with bank accounts has almost tripled from 2015–2016 (672 SHGs) to 2020–2021 (1,637 SHGs). Odisha has 1,045 SHGs linked with banks, and Maharashtra has 985 SHGs with bank accounts. More and more formation of SHGs and linkage with banks would help women become financially independent and better decision-makers.

In addition to bank accounts, SHGs needed to manage their finances and accounts. The lack of skills and education in managing household finances often resulted in low-productivity activities that added no value to an individual, household, or community. CInI provided multiple training sessions on accounting and SHG auditing to the didis of these clusters. They trained women in maintaining accounts and records. Figure 6.3 shows the involvement of trained accountants with SHGs in Jharkhand, Gujarat, Maharashtra, and Odisha.

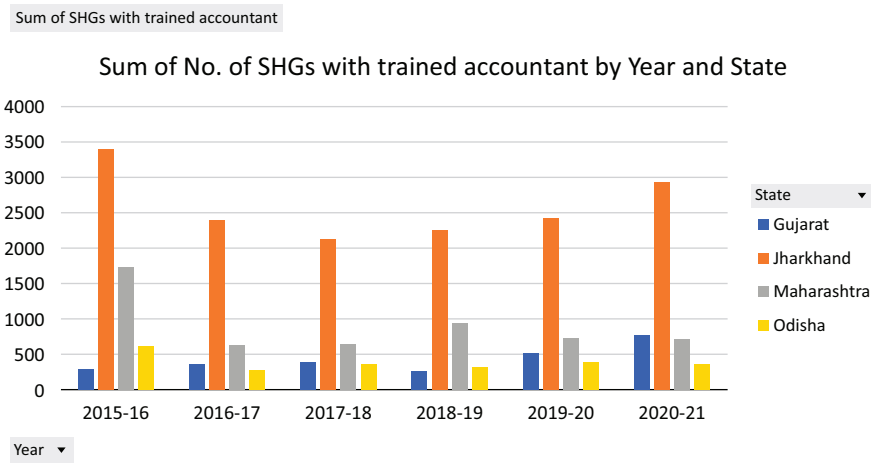

FIGURE 6.3 Number of Self-Help Groups with Trained Accountants from 2015 to 2021 in Four states.

6.4.3 Women's Role in Various Committees

Other than women's participation in agricultural activities, SHGs, and Farmers' Produce Organisations, their role in other community institutions was crucial for their representation and the strengthening of local governance. Tribal women were part of various community institutions under Panchayats, such as *village water and sanitation committees, traditional Gram Sabhas, school management committees, and water user groups.* To facilitate women's participation in multi-stakeholder committees, CInI worked with women and communities to constitute committees mandated by the government. Decentralisation of power at the grassroots level was impactful for women as it gave them the right to be part of village governance. Traditional Gram Sabhas were one of the vital platforms where women contributed to setting up strong community institutions.

Under *Jal Jeevan Mission (JJM), Department of Drinking Water and Sanitation, Ministry of Jalshakti,* 50% of seats were reserved for women in this Village Water and Sanitation Committee, and the remaining 25% were reserved for the SC/ST population. This initiative addresses the issue of water scarcity, which is personal and political, especially for women. They were involved in planning, monitoring, and implementing structures and ensuring drinking water for all households with maintenance and operational systems in the villages.

This initiative gave women visibility and representation, as seen in the leadership of Reshmaben of Dungra, Dahod, Gujarat, a woman water warrior who works with CInI to tackle water scarcity, which was also crucial

for sanitation. Another informal body set up by CInI gave women from SHGs and VOs stages to become part of setting up irrigation and ensuring its smooth functioning at all village levels. This water user group generated revenues for the community from irrigation innovation with well-maintained water distribution. This boosted agriculture, food security, and cash crop production. Men are also part of these committees. Moreover, women who worked with CInI also took responsibility for school management committees. Here, the women's enrollment rate was high, and they actively participated in the smooth functioning of school management for good education, better future opportunities, and facilities for the children.

6.4.4 Aspirations of Women

A step towards gender mainstreaming in the field can give rise to such role models and help overcome gender stereotypes, as well as enhance individual women's ambitions and desire to pursue traditionally male-dominated fields, such as leadership (Beaman et al., 2012). Women's empowerment, in particular, could be promoted by raising aspirations (Nandi & Nedumaran, 2021). CInI's approach to implementing LKP resulted from several discussions with women about their aspirations for themselves and their community.

Women's leadership in agriculture directly influenced the gender balance in community leadership. In turn, this may also raise the aspirations of women and shape educational and career choices. Aspirations of people, especially women, were a sign of forward-thinking. Previous research on women's status in India (Gupta et al., 2017) revealed that higher demand for female labour in agriculture resulted in women having a better status. The difficulties of farming, combined with women's aspirations for a better, urban lifestyle, boosted school enrollment and educational aspirations among young women in rural India. Women became confident with increasing participation in training and field education by CInI. The aspirations of the women and their implications for the family and community were evident in the CInI clusters. *Women's aspiration for the community*: For women, it was very important to see the community develop. The FPC leaders and SHG members envisioned a comfortable life for the villagers. They hoped for a pucca road and decent sanitation. They also wished for a proper water supply to the field for irrigation. Furthermore, they wished to involve all the women in the village and go forward together!

Taking inspiration from such women, CInI declared "scooty didi" as a mascot for our Mission 2020 programme. She represented the community's desire for change, important to achieving the programme's goals. After becoming a "lakhpati", the women purchased a scooty for themselves – to enjoy the freedom of mobility, to transport their agricultural produce to market, and to transport their children to school, among other things. This emerged as a

desire of tribal women, and it became a strong motivator to excite and inspire individuals to achieve their dreams of affluence and shift their mindset.

Women's aspiration for their family: The most important ambition of women was to give their children access to better educational opportunities. An FPC leader from Gujarat shared how CInI's intervention gave her the confidence to help her daughter pursue a nursing course, further opening up the health and educational avenues in the village. Furthermore, many women wanted to buy a bike or scooty for personal and family use to ease their transportation woes. *Women's aspiration for themselves*: Women unanimously wished for financial stability. Female leaders from the Harichandanpur district in Odisha wished for at least Rs. 2 lakhs in their bank accounts at the time of retirement and to construct their own houses. "I do not want to rely on my children. Who knows when they would want to throw us away? I want to have my own money and house", said Saraswati Didi, a new FPC leader. Women from the SAFE Kheroj in Gujarat wanted to continue learning new things. Saritaben says:

> Through CInI, I have learnt a lot. When I joined CInI, I was an angoothachaap (a non-literate person who doesn't know how to sign and uses their thumbprint as a signature). But now, I have learnt to at least sign. Today all the documents in my FPC come to me for signature, and I am proud that I can sign my name. I have even learnt a few English words – "Thank you, Ben!"

While conversing with one of Jharkhand's FPCs of Murhu, the *didis* shed light on what they aspired to for themselves and the community (Box 6.5).

Box 6.4 Murhu Nari Shakti Kisan Producer Company Limited (MNSKPCL), Jharkhand

Most of the BOD didis in the FPC joined several self-help groups through CInI's involvement in 2015. Women got exposure to saving practices through SHGs. These SHGs came together to form Village Organisations. Like other VOs, these women face challenges managing and promoting their businesses. "Hum toh sirf ek tokri le ja paate the bechane ke liye" [We could only carry one basket of vegetables to sell]. The closest market was 30 km from the village, making the transportation of their vegetables a huge challenge. Several VOs came together to form a farmer producer company to tackle this issue. This FPC – MNSKPCL – was officially registered on 5 March 2018, smoothing the process of storage, transport, marketing, and sales of vegetables for the farmers. While CInI's intervention eased the villagers' woes, it had a tremendous impact on women. Earlier, women's worlds were limited only to their families. Despite multiple

interactions, they were hesitant to open up. But after several exposure meetings and training, women have started to open up. One of the didis shared that,

> pehle sahab logon ko dekh kar darr lagta tha. Hum kuch nhi bol paate the. Darr lagta tha ki kahin kuch galat na bol dein. Magar ab kursi dekhte hi baith jaate hai aur apni baat sabke saamne rakhte hai bina dare!
>
> [Initially, we used to get scared when we saw men in the meetings. We are afraid we might say something wrong, so we wouldn't speak. But now, when we see an empty chair, we quickly sit down and start sharing our thoughts confidently!]

During one of the training sessions with CInI, these women drew an ideal picture of their village. They envisioned a village with pucca roads, sufficient water supply, and happy villagers. A few drew a picture of a didi dropping off her daughter at school in a scooty. Today, they proudly exclaim, "humare sapne poore ho gye hai!" [Our dreams have come true!]. Now, many didis own a scooty and earn enough to provide a good education for their children. Some are now aiming for a new AC car! Some didis also hope that "Ek din yahan ki auratein jeans bhi pehenengi" [One day, the women here will wear jeans as well]. Continuous support and positive reinforcement from CInI have brought a world of change in these didis' lives. This year, MNSKPCL has been awarded the best FPO in Jharkhand by the Government of Jharkhand and the Best FPO award in the Eastern India region by Samunnati FPO Economic Times. One of the didis summed up CInI's role in their lives as "jaise ek bacche ko chalne ka sahara chahiye, waise hi sahara hume CInI ne diya hai" [CInI has supported us in the same way we support a child who is learning to walk].

These didis are indeed an inspiration to all while aspiring for personal as well as community development. They have taken up the roles of confident leaders, empowered women in their villages, handled accounts, mediated between authorities, and run companies, all while holding a baby!

6.4.5 Community Development

Desai and Joshi (2014) found that women in villages with SHGs were more likely than their counterparts in other villages to participate in group programmes, gain greater "personal autonomy" (including greater control over household decision-making), participate in collective action on issues like water and sanitation, and engage in community affairs.

With the backlash, lack of support, and discouragement women faced from the community in the CInI clusters, they eventually started supporting women. They challenged the traditional power centres in the community,

but the achievements of women in the village shifted the patriarchal mindset of the people. The women who were part of the Panchayati Raj system became part of the SHGs, while women from SHGs and FPCs were not involved in Panchayati Raj systems. These community structures benefitted women, which influenced other women to get involved in the different institutions where they had a dialogue with various stakeholders. This helped in the socio-economic growth of the women: they knew where banking, hospitals, schools, etc., were. People from the community supported the women for the development of the community with unity, which was one of the characteristics of the tribal population in India (Boxes 6.5 and 6.6).

Box 6.5 The Journey of Emerging Tribal Women Leaders and Community Development

Saraswati Behra, the chairperson, and Sarita Dandapat, the chairperson of Sakamsindhu Producer Company, Sarpatha village, Tangariya Panchayat, Harichandanpur, Odisha, are the board members of the farmer producer company that has been associated with CInI since 2016. They are part of a newly formed FPC. When asked for the reasons for forming an FPC, the leaders shared that the village farmers used to travel about 45–50 km to sell their vegetables. Many are women, widowed farmers, or are from families with only one member present, so the travel wastes the farmers' time, and they eventually don't get the right price for their produce. Moreover, marketing the products became difficult in such a situation. Farmers are unaware of the original price, and the traders easily trick them. Even fertiliser prices are high, which gave rise to the new farmer producer company with 110 farmer members. All women members run the farmer producer company and believe that,

> When we can run Self-help groups (SHGs), then we can run (Farmer Producer company) FPC. We don't need dadas.

Now there are ten SHGs in the village, one of the crucial stepping stones towards women's empowerment. SHGs have helped people get to know people and expand their networks. They are more confident in interacting with different stakeholders of community institutions such as Panchayati system members, Gram Sabhas, etc. Also, they have benefitted women by teaching them about their finances, how to maintain their account details, how to have a dialogue with bank managers, and decision-making on assets without being dependent on a male family member. However, tribal women also faced backlash from the men of the community and political stakeholders. Patriarchy demotivated them; men used to doubt their capabilities and believed that if men could not do something, women could also not do it. However, these women took the

challenge and successfully achieved their goals of working for the farmers with CInI. Women could also decide which crop to grow, how to use their savings, plan in Gram Sabhas and Panchayats, etc.

All the women leaders have also protested in unity for the community's welfare. For instance, they are not getting funding for solar panels or drip irrigation from the bank managers because they consider women incapable and do not pay heed. However, they protested and gave a dharna. Moreover, they eventually managed to receive the funds. Both Saraswati and Sarita didi manage the household work, their personal lives, and professional lives with the support of their families. During COVID-19, the farmers faced significant losses, but they stepped up to support them and helped the traders to sell their produce. Saraswati didi became Lakhpati Kisan in 2013 and Sarita didi in 2020.

Saraswati didi is also involved in doing audits for the SHGs, and now they have grown the family of women groups by influencing them. However, she often hears from the community members that "Tum mere parivar ko barbad kar rahe ho" [You are ruining my family].

But such instances haven't stopped them from working. Her family also supports Saraswati didi. She has a car in her name, a bank account of her own, savings from her work in the field, and she is also helped financially by her husband, but she has no land in her name. Sarita Didi still has nothing in her name except a bank account. Overall, they found their relationship and engagement with CInI very fruitful and motivating, enjoyed their leadership position, and aspired to have a good amount of savings for themselves to be utilised in their old age, better yield, and a house in their names. They also want their children to have a good education, jobs, and income at home, and Saraswati didi wants a scooty from her savings. They also want a vibrant Lakhpati village with children in education. They have become role models for other women from the community and motivate others to become independent and work for a happy community.

And another case which speaks for its strong community-centric approach, and is rural-tribal women-led, is Gadaun's self-help group of Odisha (Box 6.6).

Box 6.6 Gadaun's Self-Help Group, Harichandanpur, Odisha (A Community-Centric Approach Led by Rural Tribal Women)

The SHG members managed the tasks of this initiative capably and provided end-to-end support from watering and fertiliser application to spraying and marketing. The Gaduan self-help group perfectly embodies CInI's two core values – a community-centric approach led by rural-tribal women.

Laxmi Narayani, Maa Mangala, and Maa Gouri formed the Gaduan SHG under the Gram Panchayat Level Federation (GPLF) and the Tangriapal Gram Panchayat Level Federation. The work done by women-led community groups, like SHGs, village organisations, and federations, has been at the heart of "Mission 2020: Lakhpati Kisan". These groups were responsible for leading the interventions on the ground and supporting households in executing them. By motivating the people around them to invest their efforts in CInI's interventions, women-led groups played a vital role in ensuring the irreversibility of change within their regions. Since their formation, the Gaduan SHG has managed many responsibilities for their community, like arranging regular meetings, ensuring loan rotation, and following all the required norms. The group also actively participated in the Lakhpati Kisan programme, monitoring all livelihood activities while guiding CInI and their communities. Under the Gaduan SHG's leadership, individual drip irrigation systems were successfully installed over 5.62 acres for 21 farmers in their community. All activities – from vendor selection to the arrangement of loans – were implemented and executed by the women of the SHG themselves. The Gaduan SHG also launched a joint initiative with CInI to promote vegetable cultivation. The SHG members managed the tasks of this initiative capably and provided end-to-end support from watering and fertiliser application to spraying and marketing. Overall, the changes introduced by the Gaduan SHG helped a new wave of rural-tribal farmers become self-sustainable. Their joint initiative also gave rural-tribal women in their community a chance to earn a livelihood and direct access to farming inputs and markets. What started as a group of ordinary rural-tribal women has become vital for irreversible change in Gaduan.

6.4.6 Pandemic and Community Preparedness in Central Tribal Belt of India

Although the tribal population faces disastrous challenges due to climate distress, the COVID-19 pandemic also took a toll. COVID-19 was a global health pandemic. The immediate response of CInI and other village organisations that worked with women and the community was to maintain the pace of work at the village level across all four states. Women-led communities came together to face the crisis and not in isolation. Women farmers and leaders worked strategically with the help of the CInI team. The people from the community were educated about how to tackle pandemics with the help of the digital world by innovation, which is also one of the core values of CInI. Awareness was raised among the community with the help of posters and banners, awareness generation videos in regional languages, text messages to farmers about the pandemic, and messages sent with the help of WhatsApp to all community-based influencers. Although "lakhpati farmers" had enough food to survive the lockdown, other small farm holders faced challenges. Women leaders of farmer producer organisations took

over the ownership and responsibilities to work for the community. Women from SHGs also stitched cloth face masks to distribute in the community.

Tribal communities had a rich culture and were believers in unity. With minimal guidance from the CInI team, the women leaders and the community resolved the issues people faced and continued networking and supply chain linkages with markets. The sense of togetherness could be observed in the case of a small farm holder of Jamadra village, Dahod. His hamlet was hit badly and lacked access to the local markets. He said,

> Initially, we also traded our harvest in barter for grains, vegetables we didn't have. It was a tough time. But at this time, the people of the hamlet came together to resolve this with minimal virtual facilitation from CInI. They can make market linkages at fair market prices.

6.5 Summary and Conclusion

Women's work has often been a backwater of agricultural leadership. Empowerment in the context of rural-tribal women can be explained as "the expansion in people's ability to make strategic life choices in a context where this ability was previously denied to them" (Kabeer, 1999). In this context, this chapter has argued that positive changes were taking place due to CInI's interventions as women stepped into leadership roles as agricultural leaders. These included an increase in female-led cooperatives, an increase in women taking up the agri-business model of rural finance, an increase in self-reliance by rural women through their enterprises, and women being involved in policy formulation at the village level. It was noted that these changes are possible because of a greater acceptance and appreciation of women in these roles.

The chapter showed that tribal, rural women have taken up leadership roles in their areas of activity and have started to play leadership roles in agricultural development in areas, including SHG formation and even auditing of SHGs. It was observed that the process of involving women in agriculture was multi-faceted. For example, a woman who wants to work as an agricultural leader must undergo an elaborate qualification process. This includes becoming a member of an SHG she wants to work in and becoming a leader.

This chapter also showed that the process of involving women in agricultural leadership was fraught with problems, which included the need to identify and reach women who could take up leadership roles in the agriculture sector, the problem of maintaining leadership roles for women in groups where it may be difficult for women to have decision-making powers, the possible problem of women being sidelined in leadership positions, and, finally, the need to ensure that leadership among women was not a means

for them to achieve financial independence at the expense of their family members.

Tribal women were not only involved in agricultural-based activities but also worked as leaders to educate and train people in their community on a range of issues, from gender sensitisation to health-related issues such as the menstrual hygiene of women. From the work of CInI, it was also visible that their goal is to put the household and community on the pathway to being Lakhpati. However, most importantly, they believe in giving representation and letting tribal families take charge of quality-of-life enhancement. Moreover, making households inclusive does not leave out people with disabilities. This can be seen in the case of Nirmalaben Bariya and her husband Sureshbhai of Dahod district of Gujarat, who started with one acre of her ancestral land. Many capacity-building activities of CInI helped her become "Lakhpati Kisan". Their disability did not limit them from reaching a poverty-free life. CInI focused on the holistic development of the women, their families, and the community, which was done by adopting behaviour change communication where community resource persons, who were mostly women, acted as facilitators which provided them with livelihood options and leadership roles, which further helped in their and the community's well-being and capacity building.

This effort of CInI also resulted in effective and efficient community institutions, such as gram panchayats, which changed the power equation between men and women by changing the traditional mindset and perspective on the development agenda. Moreover, the efforts of tribal women, the community, and CInI were recognised by celebrating them, which motivated others to do better, turned interference or backlash into support, reduced violence against women, and led to social acceptance of women in leadership within their families and community. Their rise in the political sphere, where they protested the patriarchal structure, gave them more space for decision-making. LKP filled women with confidence and dignity, gave them the courage to take leadership decisions, and helped create a new identity for themselves.

COVID-19 restricted CInI from meeting the farmers and leaders in the field, and they met virtually. During this time, women leaders worked with minimal guidance and help in unity with the tribal population. The LKP model of removing the tribal population from the vicious cycle of poverty with and through the tribal population and their focus on holistic development was crucial for sustainable change in behaviour, practices, and knowledge. As a positive step towards guaranteeing sustainability, women-led community institutions have taken greater ownership of the initiative; they not only aspire to improve the well-being of their children, family, and community but also focus on their needs and wants.

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7

INSTITUTIONS AND ENTREPRENEURSHIP

Strategies to Meet the Aspirations of Farmers and Move towards Irreversibility

Sirshendu Paul, Garima Kumari, Aboli Kulkarni, Arth Mishra and Ambika Pandey

7.1 Introduction

With the evolving experiences from the ground, CInI identified multiple gaps rooted in the production and supply chain system: the absence of service delivery systems at the household level, poor technical know-how among farmers, and a lack of standardised training in agriculture and allied activities. In addition, due to poor connectivity with the markets, farmers could not secure a fair price for their produce.

Against this backdrop, from 2017 onwards, CInI emphasised promoting an institution-based micro-enterprise model as a strategic intervention for achieving sustainable irreversibility of the impact under Mission 2020. This intervention was envisaged to result in self-reliant community institutions and support the emergence of a resilient local economy in the long run. The underlying framework aimed to shape a virtuous arrangement by design wherein the community-based institutions spearhead the development process by nurturing and promoting micro-entrepreneurs to achieve the overall goal of households becoming "Lakhpati Kisan".

The success of the institutional model relies greatly on its foundational principles-led approach and multi-stakeholder partnership involving private players, government, community institutions, and households. Additionally, a strong emphasis is placed on institutions and capacity building, with the Board of Directors, Local Resource Persons, and External Resource Persons being the key cogs of the wheel. From the perspective of tribal-rural households, such a community-driven model holds high significance, as it can potentially empower these communities and facilitate their exit from the state of generational poverty.

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The tangible outcomes of rural entrepreneurship and community-based organisation are vividly reflected in CInI's ability to form and diligently work with 7,680 SHGs across 448 VOs and 22 apex institutions (federations/FPCs/FPOs) over the years. Today, these apex institutions are successfully providing services to 160,000 households. On the other hand, the intangible outcomes are the financial empowerment of rural women that has manifested in their increased contribution to the social development of their region, along with nurturing their leadership skills through participation in community institutions. Interestingly, the culture of silence that had surrounded the rural-tribal households for generations is now waning as CInI's support has increased their creditworthiness, instilling confidence to uplift themselves by engaging in the market economy.

7.2 Significance of Rural Entrepreneurship

More than ever before, rural development is connected with entrepreneurship. Petrin (1994) affirms that institutions and individuals promoting rural development now see entrepreneurship as a strategic development intervention that could accelerate the rural development process. According to Gómez-Araujo (2012), Bryden and Hart (2005) opine that "entrepreneurial activity in rural areas helps to diversify the economic network and thus avoid dependence on mono-production". It is a popular belief that it can offer a greater range of services, thus improving the quality of living in these areas. Therefore, entrepreneurship is a good way to generate opportunities for professional development, social and economic integration, maintenance of the rural population, and the attraction of new residents to these territories (Akgün, Nijikamp, Baycan, and Brons, 2010). In deciding how to attract and maintain people in rural areas, scholars specifically think about young people, partly because they make up a greater percentage of the population, making them key for the future of rural areas. Muilu and Rusanen (2003) argue that these areas cannot remain viable or maintain their long-run economic functions without the youth. Thus, Chigunta (2002) agrees that entrepreneurship is an ideal tool to fulfil these functions and a good way to enhance the human capital of youth in rural areas. It provides an environment where youth can actively participate in local society, contribute their talents and visions for the future, and develop a sense of commitment and belonging to their communities (Lyngdoh, 2005). Montgomery and Weiss (2005, p. 6) argue that for the poorest, "special programmes" that "provide a range of services, covering training, health provision, and more general social development … as well as grants of assets or credits" are best positioned to improve their standards of living.

The Lakhpati Kisan Initiative hopes to improve the quality of living for over 100,000 households through improvements to agricultural enterprise

and allied activities (Chacko, 2018). A flagship intervention, CInI has developed and conducted the project first-hand in some areas, contrasting with their usual intervention activities – acting as a donor to smaller NGOs and development organisations. The project situates itself in a unique socket of interventionist methodologies by taking a multidimensional approach to increase the incomes and living standards across tribal village communities along India's tribal belt (ibid.). The project hosts initiatives including irrigation development, agrarian adaptation, livestock development, introduction of high-quality seeds and sapling nurseries, IT and education, improvements to water quality, and promoting community institutions, including SHGs (ibid.). All strategies are implemented in the context of the geography they are in. For example, piggeries have been introduced specifically in Jharkhand, where there is a demand for that market, but not to the same extent in other areas. In the context of Jharkhand, Birsa Agriculture University (BAU) and the Indian Institute of Agricultural Biotechnology, Ranchi, extended services on knowledge building and input such as piglets, chicks, and medicine. Similarly, while pre-existing financial institutions/markets were present in Gujarat which could be tapped into for generating income, elsewhere, market linkages were largely started from scratch. Combining multiple programmes and initiatives is expected to subside the negative effects of stand-alone strategies, presenting an opportunity to irreversibly lift the poorest of the poor out of poverty. If successful, the Lakhpati Kisan could act as a blueprint for other development initiatives to help communities prosper. Focusing specifically on tribal communities and women, the initiative is also well placed to concentrate resources on those most marginalised in society, executing a project with opportunities to challenge the diverse and comprehensive inequalities that inhabit rural India.

7.3 Strategic Intervention by CInI

A three-pronged approach was devised to successfully operationalise the microenterprise model:

- Formation of community-based apex institutions (like FPOs, and FPCs) as enterprise incubators at the production cluster level.
- Promotion of engaging rural entrepreneurs to facilitate service delivery systems at the household level to bridge the gaps in agriculture and allied activities' demand and supply chain.
- Developing an operational ecosystem with the help of community resource persons, market players, Social Alpha, CropIn, producer groups, etc.

7.3.1 A Built-up Operational Ecosystem

The institutional microenterprise model of rural entrepreneurship involves a web of skilfully designed network linkages. The relationship and interaction among the different stakeholders exhibit three characteristics (Figure 7.1). Firstly, it involves buying and selling goods and services. In addition, there is the transfer of money and credits. Lastly, it facilitates the exchange of information. The ecosystem design situates the FPOs at the centre of empowering tribal communities and protecting their interests against market vulnerabilities. FPOs serve many different roles in this ecosystem.

- **For rural entrepreneurs**: FPOs incubate and provide them with scheduled orders and any help with necessary support systems like training and capacity building.
- **For tribal households**: FPOs facilitate buying quality farm inputs from entrepreneurs, enable the marketing of agricultural produce, and procure NTFPs like Lac in Jharkhand for selling to processing units.
- **For market players**: FPOs act as single-point destinations for buying agricultural goods and services. Consequently, wholesalers and institutional buyers benefit from this.

With the support of the respective implementing support agency (ISAs, who receive the onward grant from CInI to implement) and CInI, FPOs engage with the communities extensively by deploying their field staff for micro-planning crops, livestock, and NTFP and subsequently facilitate demonstration,

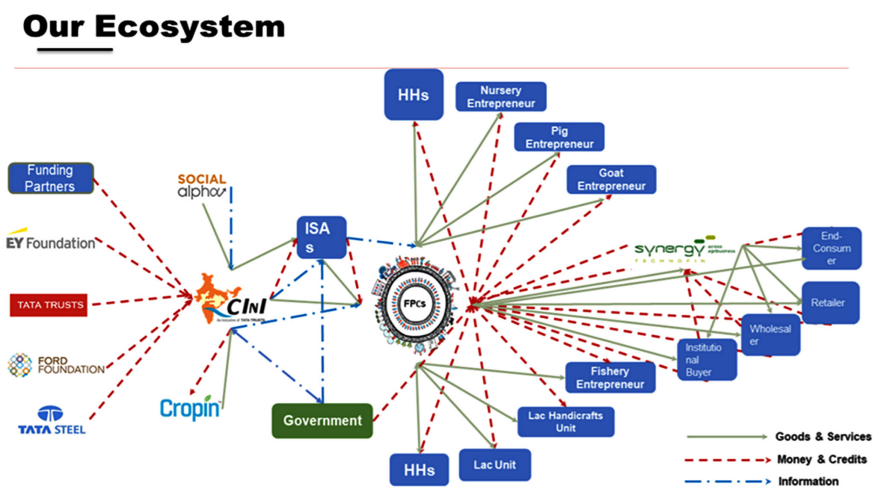

FIGURE 7.1 Ecosystem of Rural Entrepreneurship Model.

Source: Author's Compilation.

training, and continuous support in the maintenance of the latest POPs. Moreover, ISAs also route the money transfers from the funding partners to the FPOs via CInI. Innovation and technological support systems are crucial for the rural entrepreneurship model's success. In this regard, platforms like Social Alpha and CropIn are utilised to enhance the transparency of timely data collection and to assist in the capacity building of the tribal households. Knowledge and information are exchanged with government institutions regarding the works of CInI and ISAs and FPCs. Village-level institutions/PGs/SHGs/VOs access credits from the Department of Rural Development (NRLM-compliant projects in CInI working states: Jharkhand, Odisha, Maharashtra, and Gujarat) and this programme leads to enhanced livelihoods for the betterment of life.

7.4 Theory and Practice

7.4.1 Adding Principles to the Five Cores

The Lakhpati Kisan Programme was initiated with five key operational principles: institutions spearheading the development process a community-centred approach, demand-led interventions, market-orientated interventions, and innovations to move beyond stereotype processes (discussed in Chapter 2). However, building on the experiences of the programme, the third year experienced apex institution building and the promotion of rural enterprise systems. This signified a need to consider the existing core principles from a business perspective and to add new principles for assisting the communities in leveraging their income potential by negotiating with the market forces while protecting their interests. These are as follows:

- **Value chain intervention**: Value chain interventions at each thematic level – agriculture, NTFP, and livestock – remain fundamental to demand-driven and market-led production. From input aggregation and production stabilisation to marketing goods and services, all these activities enhance the FPOs' business generation and enterprise promotion.
- **Establishment of entrepreneurs for service delivery**: Lakhpati Kisan Programme focuses on encouraging and supporting the establishment of entrepreneurs in rural areas. To enable it, CInI needed to build a multifarious ecosystem in the FPOs, where the entrepreneurs could work together or individually with the ecosystem to deliver services to the households. Entrepreneurship was envisaged at each thematic level to support the supply chain's pre-production, production, and post-production gap.
- **Women leadership development**: An uncompromising value that is being followed religiously at every level of community institutions is total ownership by women. CInI's earlier experiences in the rural

development sector led to the realisation that women are key contributors to the all-around development of families. Hence, empowering them would bring about sustainable and transformational change in rural-tribal communities.

- **Investing earnings:** As a household starts generating income through the Lakhpati Kisan Programme, an improved quality of life is experienced. The earnings are encouraged to be invested in toilet construction, installation of Jal Minars in villages, taking up livelihood prototypes for higher community contributions, purchasing two-wheelers for commutation, educating children, and increasing personal savings for the women.

Working along these tenets helps CInI to internally organise and orient itself towards the goals of institutional building and rural entrepreneurship.

7.4.2 Community-Based Institutions: An Important Pillar

Irreversibility of impact, with increased resilience of the communities, has been one of the core principles of the Lakhpati Kisan Programme, and CInI envisioned empowering the communities to be the drivers of their own social and economic empowerment. A natural extension of this principle has been the extensive development of community-based institutions such as SHGs, VLOs/Gram Sangathan, and apex-level institutions (federations) to spearhead the development processes.

Institution building has evolved over the past five years of Lakhpati Kisan (Readers should look at Table 2.4: Year Wise of Interventions, Chapter 2, for CInI plans on establishing CBOs). For the first two years, CInI focused on establishing a network of primary- – SHGs – and secondary-level institutions – VLOs – across the production clusters under its programme area. A deliberate emphasis was given to building these institutions' capacities via SHG leadership development, management, and VO management training. Outstation field exposure visits were also organised to many villages, allowing them to learn best practices about the functioning of institutions; eventually, as the next step, CInI invested in building the apex-level institutions to cater to the developmental needs of the community (Table 7.1). The third year of the Lakhpati Kisan Initiative experienced a massive movement towards building apex institutions and promoting rural enterprise systems.

7.4.2.1 Structure, Role, and Functions of the Institutions

As per the prescribed norms, the size of a self help group had to be a minimum of ten households. So, CInI selected 10–14 households for the building of a single SHG. As the clusters wherein LKP was operational mainly constituted rural tribal people along with the presence of distinct hamlets, CInI

TABLE 7.1 Households under Community Institutions and FPOs Incorporated

Region	*# of FPOs Incorporated*	*# of Shareholders/Members*	*# HHs under Community Institutions*
Maharashtra	2	2,150	30,000
Gujarat	9	47,585	61,000
Odisha	2	261	25,000
Jharkhand	7	12,031	44,000
Total	**20**	**62,027**	**160,000**

Source: Collectives for Integrated Initiatives, 2022.

undertook it as the basic unit for setting up SHGs. These were tasked with planning agriculture-related work in their region under the Annual Work Plan. This included deciding a good sowing time, the crop type, its seeds, and the necessary fertilisers and pesticides. The composition of the SHG was wholly women, which was an uncompromising value that CInI adhered to, owing to its experience of working in the rural development area and realising the importance of women as a change agent.

A level up in the hierarchy was the village-level organisations, formed with the elected representatives from SHGs. VLOs were the secondary-level institutions present at the village level. The main role played by them was to aggregate the demand from the primary-level institutions, i.e., SHGs, and to act as the facilitator between the grassroots SHGs and apex-level institutions [FPOs/FPCs]. VLOs functioned through subcommittees, which divided the work into themes like seed, irrigation, fertilisers, etc.

At the apex level, the federations viz., farmer producer organisations/farmer producer companies, were formed with the elected representatives from the village-level organisations. They were registered under the Companies Act 2013. These institutions play a critical role in two ways. First is the backward linkage, which means facilitating seed licences, fertiliser licences, and access to timely inputs and credit/working capital to the SHGs. Second is the forward linkage which essentially means utilising its scale of operation to establish connections with market companies like Bayers to increase overall profitability.

It was also observed that the apex-level institutions got involved in a formal agreement with the banking institutions and independent organisations like RangDe, to act as guarantors for the provisioning of loans to rural entrepreneurs and SHGs. Further, these institutions also coordinated with the informal user groups (e.g., producer groups, water groups) formed for common interests in fulfilling their specific demands. A simplified working mechanism of the institutions is represented in Figure 7.2.

It is important to note that CInI's role has been substantial in the institution building process. It assists the federation in developing its business plans,

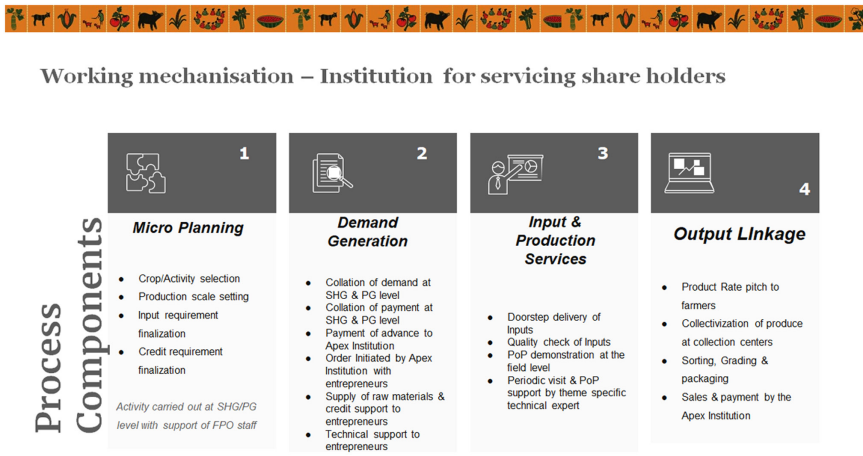

FIGURE 7.2 Working Mechanism of the Institutions.

Source: Author's Compilation.

facilitating the capacity building of the federation members, establishing market linkages, roping in organisations like RangDe for credit provisioning, and setting up institutions' standardised processes like Package of Practices (PoPs).

The project's overarching goals are threefold. Firstly, it aims to bring each targeted household under the umbrella of women-led SHGs as the central institutions. By doing so, the project seeks to empower women and create a strong foundation for community development. Secondly, the initiative strives to spearhead the scale-up and development process in the region through the active involvement of apex institutions, FPOs, and federation/cluster-level federations. These key players will collaborate to enhance the impact and sustainability of the project, fostering economic growth and social progress. Lastly, the project has set a specific target for each FPO to achieve an annual turnover of Rs. 10 crore for the apex-level institutions by 2025. This ambitious financial objective demonstrates the commitment to elevating the livelihoods of the community members and elevating their economic status significantly. Together, these objectives represent a comprehensive and determined effort to uplift the region and create lasting positive change.

Initially, CInI deployed programme managers and area coordinators to implement the Annual Work Plan (AWP). But now, the responsibility to monitor the plan implementation is being shifted towards the women's group of the Board of Directors (BoD), assigned their area (known as BoD kshetra) as per AWP. These BoDs are the decision-makers at the apex-level institutions, and their work ranges from visiting households to increase the shareholders of FPOs, contracting with market players to maximise the business gains, and visiting the collector's office with their AWP to seek administrative assistance.

7.4.2.2 CInI Withdrawal: Panchayat Exit Plan

In the AWP exercise conducted in Bodh Gaya in March 2018, the first level deliberations on leaving implementation of one GP with the didis of the federation/FPO were made. As per the plan, federation members were allowed to take up the implementation in their GP independently, and their financial independence was ensured. Each PIP made a lump sum provision of around Rs. 5L to the respective SHG/VO to achieve this. Since CInI does not impose such decisions unilaterally, a two-day workshop was organised in Ranchi in April 2018 for the representatives of the federation/FPO.

The community well received the idea of the workshop. Didis were genuinely concerned about the development of their villages and took this opportunity to develop leadership skills. The workshop changed their perspective, and they were prepared to responsibly bring about change in their community instead of remaining mere beneficiaries of ISAs. Indeed, the initiative was a success.

7.4.2.3 Apex-Level Institutions as Microenterprise Incubators

A farmer is a risk-taking entrepreneur who faces uncertainties from weather, spurious inputs, pests, diseases, and market shocks. Through incubation by the FPOs, a network of micro-entrepreneurs was developed and integrated into the supply chain that specifically catered to the needs of the shareholders. CInI's experience working with the tribal farm households and communities showed that they were mired in debt traps and poverty over the decades, spanning generations. Naturally, they were averse to taking high risks. Also, it manifested as a culture of silence due to their inability to empower themselves. The small and marginal tribal farmers, when provided with the hand-holding support to inculcate professionalism in their microenterprise endeavours, experienced enhanced livelihoods and became success stories themselves.

Taking motivation from the National Policy for the Promotion of FPOs, in 2017, CInI started channelling its insightful learnings from the initial years of the Lakhpati Kisan Initiative to integrate rural entrepreneurs into FPOs/community-led apex-level institutions. The National Policy for the Promotion of FPOs 2013 admits that the collectivisation of producers, especially small and marginal farmers, into producer organisations has emerged as one of the most effective pathways to address the many challenges of agriculture, but importantly for improved access to investments, technology, inputs, and markets. To successfully implement the entrepreneur-building strategy for community development, CInI invests in the **Entrepreneur Selection Process** (Figure 7.3), which focuses on inducting motivated people with an entrepreneurial mindset and aptitude. An important aspect of the process is the involvement of community-based

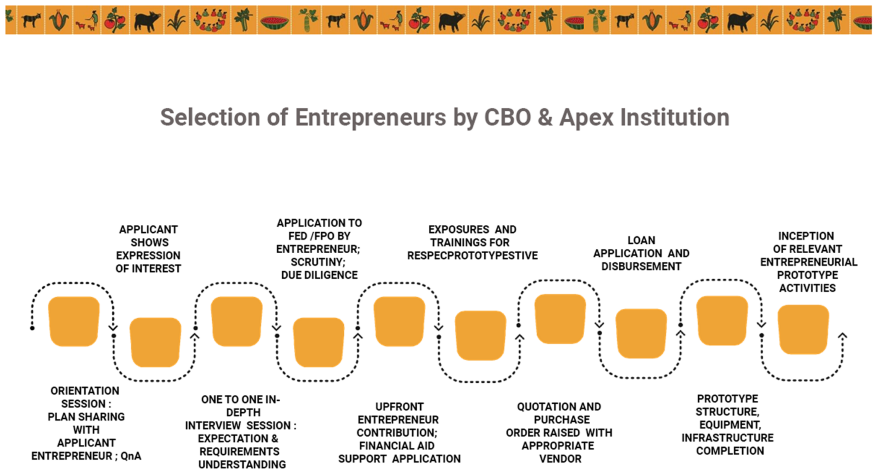

FIGURE 7.3 Stepwise Induction Process of Rural Entrepreneurs.

Source: Author's Compilation.

institutions, beginning from the screening of individuals to the preparation of the final selection list by conducting interviews with the help of an expert panel. The broader aspects of incubation include standard selection, identification process, capacity building, financial process, monitoring, and a robust review process.

Such a methodical process strengthens microentrepreneurs' selection and incubation processes. Through this institutionalisation, the communities become acclimated to a culture of good governance. To ensure long-term sustainability after the incubation of the entrepreneur, CInI also started investing in the capacity-building process to make them stronger and reduce business-related risks. Training and educational plans were structured according to the entrepreneurs' needs, competencies, and interests to enhance the knowledge and information of rural entrepreneurs. The general modules for the training process targeted the development of personal competencies, training activities related to business management and administration, and training in new technologies like marketing and digital media. Once the general plan was defined, specific training was designed according to the entrepreneurs' needs. The motivation and training were facilitated by existing successful entrepreneurs and professionals who are experts in the field. Hence, the capacity-building exercise was executed to groom rural entrepreneurs.

The apex-level institutions (see Table 7.2) have started seeing agriculture and allied service activities through a business lens. Today, their cumulative annual investment stands at around Rs. 5.43 crore, with an annual turnover of Rs. 10 crore and a profit margin of about 3–5.5%. This financial push has

TABLE 7.2 Apex-Level Institutions

Cluster/State	*FPO/FPC Name*	*Unit Established [Production / Collection/ Processing]*	*Commodity [Spice/Dal/Lac et al.]*	*Theme [Agriculture/ NTFP/ Livestock]*
Dahod, Gujarat	Limkheda Horticulture Federation	Processing	Spice	Agriculture
Khedbrahma, Gujarat	SAFE	Production	Seed, pulses,	Agriculture
Jharkhand	Churchu Nari Urja FPC	Production and processing	Lac, high-value crops	Agriculture/ NTFP

Source: Author's compilation.

encouraged them to reinvest their profits towards value addition and food processing activities. For streamlining this, they have set up collection units and production units that assist in grading, sorting, and processing various raw materials. Table 7.2 elucidates the same.

It was observed that the role of apex-level institutions was gradually amplifying for rural microentrepreneurs, and CInI's learnings from the incubation of micro-entrepreneurs manifested into developing Micro Enterprise In a Box (MIB) templates for the different micro-entrepreneurship models.

7.4.2.4 Micro-Entrepreneurship Models

To ensure the generation of sustainable income and further encourage tribal farmers to be the drivers of their economic growth and spearhead their development process, CInI developed micro-entrepreneurship models after ascertaining the requirements of the communities in the region as a whole. These include polyhouse nursery, goat entrepreneurship, pig entrepreneurship, fish entrepreneurship, and lac entrepreneurship. In Jharkhand, Veer () denotes an entrepreneur as mentioned in all images. These Veer entrepreneurs have been created in Jharkhand. JharVEER entrepreneurs under the apex institutions provide services with an in-depth understanding of the rural ecosystem and enterprises for delivering services to targeted households for their economic prosperity and growth (

Polyhouse nursery: A polyhouse is a structure made with poly film in which crops are grown in partially or fully controlled climate conditions. Climatic factors like solar radiation, temperature, humidity, and air movement are efficiently controlled depending on the requirements of the crop. Its benefits include shifting risk from marginal farmers to entrepreneurs, assured availability of readymade saplings, convenience especially considering the

FIGURE 7.4 Engagement in Entrepreneurship. Source: CInI's archive

increasing scale, improved resilience of plants, better establishment in the field due to the non-disturbance of roots owing to the use of cocopeat, and elimination of soil-related diseases. Healthy seedlings increase resilience, enable fruiting, and improve overall health for increased productivity. As central India's rural communities were new to commercial vegetable farming, raising good-quality planting material was challenging. But the apex institutions made a success of this endeavour. For example, Gayatri Mahila Cooperative Federation in Santrampur has fostered 5 nursery entrepreneurs, while the SAFE Producer Company in Khedbrahma has supported over 12 entrepreneurs. They have been prepared to cater to the demand for a specific variety of crops as per the requirements of the farmers in their village. As the most successful prototype, polyhouse nursery has received the highest loan amount.

Lac entrepreneurship: Lac, obtained from lac insects, is used for making jewellery, medicines, accessories, and decorative items. Lac handicrafts have been produced in India for centuries. In the past few years, its demand has increased in Indian and overseas markets. The key revenue is generated by selling the brood lac and scrap lac to farmers and handicraft manufacturers. As the handicraft industry uses locally available raw materials and provides various employment opportunities, it has become one of the most productive sectors of the economy. As the industry requires social capital, it can generate income and create employment for rural households.

Goat entrepreneurship: Goat husbandry is a dependable source of alternate livelihood. Families are heavily invested in rearing Black Bengal goats for meat and fattening purposes. However, there has been a dire need for quality feed, health care, and marketing services to empower these goat-rearing families. After identifying gap areas like lack of quality feed for undernourished goats, high mortality rate, average health care services, poor market access, traditional methods of goat breeding, and lack of technical veterinary knowledge, the prototype of goat entrepreneurship was established. The aim was to provide doorstep delivery of essential services enabling the effective management of goats. The benefits include low investment cost, high return on investment, existing demand for goat meat, and less effort. Typically, the products and services of this model are goat trading, goat rearing, goat deworming, vaccination, and goat artificial insemination. Apart from the consumers of meat, goat rearers are the customers.

The Gayatri Mahila Cooperative Federation in Santrampur, Gujarat, supports 20 goat service providers, 12 *Azolla* entrepreneurs, and 55 buck entrepreneurs. Goat entrepreneurs, or Pashu Sakhi/Mitra, provide treatments like deworming, primary care, and emergency treatments for goats. Since *Azolla* is nutritious, acts as a supplementary feed for cattle, enhances milk yield,

and increases goats' weight, it is given with fodder. *Azolla* entrepreneurs have established nurseries and have provided 250 units of *Azolla* seeds. For better quality milk and meat, buck entrepreneurs provide mating services. SHGs are actively involved in promoting this prototype, and their focus is on developing their goat-rearing members as entrepreneurs.

Fish entrepreneurship: Fish farming is the raising of fish in tanks or ponds for commercial purposes. This rich source of protein is a staple in the diet of many communities. This prototype, in particular, can be integrated into an existing agricultural setup of a farmer to serve as an additional income source.

Mixed fish farming is the process of cultivating three or more species of fish in the same pond. The space is optimally utilised by growing species in different pond layers. Also, it prevents the fish from competing for food. The benefits of fish entrepreneurship include the flexibility to pursue different stages of fish outputs, low effort, and low capital cost. In addition, fish entrepreneurs readily make fish seeds, fingerlings, and yearlings available locally. The revenue depends on fingerlings, but an entrepreneur can customise the offering by selling bigger-sized fish to fish farmers and consumers.

Piglet entrepreneurship: The socio-economically backward sections of society rear pigs. Their source of revenue is the sale of piglets and adult pigs. Compared to other livestock options, pig farming creates rapid income growth due to a better feed-meat conversion ratio, high nutrition ratio, better fecundity, early maturity, and short generation intervals. It can meet the increased demand for meat provided there is an uninterrupted supply of piglets. Adult pigs of the TND breed can weigh up to 100 kg and are priced accordingly. The primary product offering is 2–4-month-old piglets. The Jharsukh breed is especially known for its high feed-to-meat conversion ratio. Usually, the piglets weigh between 10 and 22 kg and are priced at Rs. 2,500. Apart from pork meat retailers, customers include farmers and households practising pig husbandry for rearing and/or fattening. As CInI has helped overcome challenges like the quality of breeding stocks, disease vulnerability, and lack of knowledge and rearing expertise, the profit-generating capacity of this prototype is enhanced. To enhance our understanding of the abovementioned entrepreneurship models, their financial models are explained in Table 7.3.

7.5 Discussing the Highlights

7.5.1 Pyramid of Trickle Down: A Smart Design

Figure 7.5 shows how the pyramid of numbers and benefits exists and operates respectively among the households, rural entrepreneurs, and

TABLE 7.3 Financial Model of Prototypes

Prototype	*Total Investment(INR)*	*Trust*	*CC*	*Credit*	*Other Source*	*Return Annually*
Polyhouse nursery	450,000	200,000	30,000	120,000	100,000	250,000–300,000
Lac entrepreneurship	400,000	60,000	240,000	60,000	40,000	150,000–300,000
Goat entrepreneurship	260,000	80,000	93,000	40,000	47,000	(Awaiting data)
Fish entrepreneurship	37,000		8,640			90,000 (perennial year)
Pig entrepreneurship	175,000	80,000	25,000	70,000	25,000	Year 1: 80,000
						Year 3 onwards: 208,000

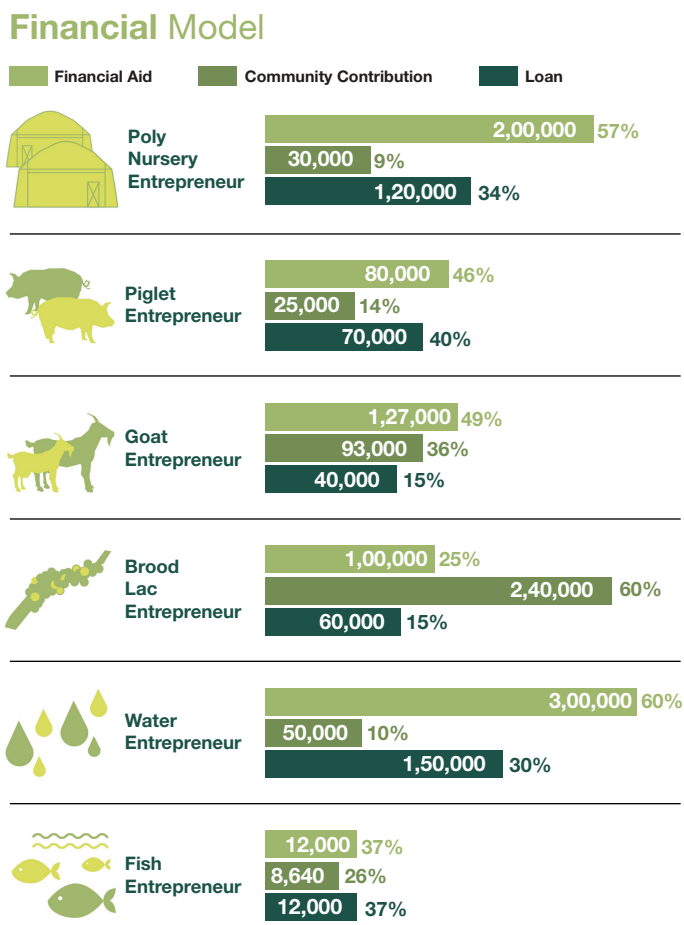

FIGURE 7.5 Pyramid of Numbers Depicting the Percolation of Benefits.

Source: Author's Compilation.

community-based apex institutions. Here, apex institutions like FPOs are crucial in incubating rural entrepreneurs and protecting farmers' interests in realising a fair market. This, in turn, enhances the prospects of higher production and return for farmers and rural entrepreneurs since the discrepancies in service delivery systems and value chains are reduced. To an extent, it has led to the percolation of tangible and intangible benefits to households in a longer-term and sustainable manner at the grassroots level.

7.5.2 Scope of Micro-Entrepreneurship in Our Ecosystem

The current market dynamics are strongly influenced by the consolidation of new technical-economic paradigms, where the globalisation of economies has led to increased economic competition. In this context, CInI factored in technology and innovations as a critical aspect of the micro-enterprise model for increasing agriculture and livestock productivity, improving integration to the market, and charting a better-scheduled plan.

The scope for integrating technology in agricultural production clusters can be seen clearly in Jharkhand. In 2017, an open innovation platform, JharVEER, was developed by CInI in Jharkhand to connect rural micro-entrepreneurs among themselves with market players and other stakeholders like government departments. Over the years, the accruing benefits of JharVEER for high-tech polyhouse nurseries, lac processing units, and handicrafts have proven to be immense.

- **High-tech polyhouse nurseries for disease-free soilless saplings**: 34 high-tech polyhouse nurseries have been established across regions until 2020. Rural farmer-cum-entrepreneurs in Jharkhand own nurseries that are a replica of the Karnal[1] model and are the first of their kind in their local regions. True to their entrepreneurial spirit, these smallholder tribal farmers have undertaken a loan of Rs. 120,000 for setting up the structures. Each farmer earns a net profit of Rs. 150,000 annually, as they can complete around five cycles, each with average returns of Rs. 30,000 per cycle.
- **Lac processing and lac handicrafts**: One lac processing unit was established by the women-led community institution in Kajri village of Churchu block in Jharkhand. By the end of 2020, CInI imparted lac bangles and handicrafts-making training to nurture 22 rural women entrepreneurs for undertaking mass production.

Hence, setting up soilless saplings and deploying machines on a small scale can directly impact the quality and quantity of agricultural produce. In the present times, the utilisation of technology is quite low in these regions, but COVID-19 is acting as a fillip to become adept at wielding the technology.

7.5.3 JharVEER: A Branding Platform

Jharkhand Venture for Empowering Entrepreneurs (JharVEER) was established to promote a platform for tribal entrepreneurs in Jharkhand and to promote entrepreneurship. Adopting the service delivery system approach was critical to ensuring sustainable and irreversible incomes. It maintained the community's advantageous position, allowing them to avail of the

services at their doorstep. Importantly, there was a need to scale up the actions in the core livelihood work. By fostering an ecosystem of rural entrepreneurs and enterprises, CInI's objective was for the economy to experience irreversible change and transformation.

The necessity of augmenting the service delivery system in the tribal communities led to the envisioning of this platform. It allows entrepreneurs to connect and deal with vendors, suppliers, and service providers. Over and above market access, this platform has the potential to showcase the achievements of tribal communities to the world. Also, it can attract funders, researchers, and marketers to develop tribal communities further.

For first-time entrepreneurs, the journey is understandably daunting. Through JharVEER, they can connect with others like them, share experiences, and build confidence. As a result, there is improved coordination among entrepreneurs, and the local demands are efficiently met by ordering from the surplus stock of entrepreneurs in the vicinity. By centrally collating demand on a digital platform, they coordinate to maximise sales and minimise input costs through collective bargaining. The platform publicises low-risk and adoptable micro-enterprise models for credit partners to finance. For the success of the Lakhpati Kisan Initiative, JharVEER enables interaction with potential investors and other stakeholders such as government departments and agencies, RDD, NABARD, and bankers. This creates a fertile environment that facilitates trust-building among rural entrepreneurs, apex institutions, individuals, and funding organisations. The approach adopted by Jharkhand (Figure 7.7) letsallows us to address a five-step strategy for implementing rural entrepreneurship.

New technology-based interventions necessitated relevant technical knowledge and skills. Also, to attain high market value for the crop yields,

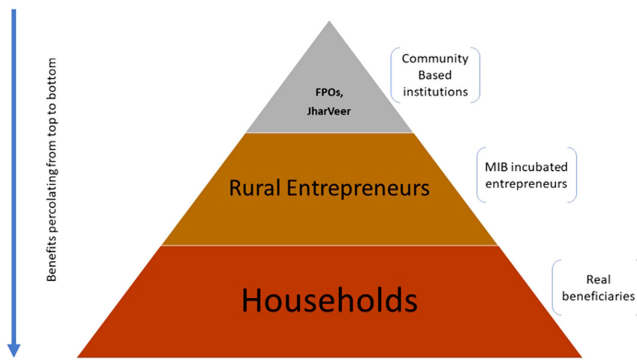

FIGURE 7.6 JharVEER Model.

Source: JharVEER Report.

FIGURE 7.7 JharVEER Approach. Source: CInI's acrhive

adopting technology for sorting-grading, drying, and weighing was crucial. Entrepreneurs were introduced to world-class innovations and technologies to fill this knowledge gap. The technologies were demystified and customised to the local context for relative ease of use. The demonstrated success of the entrepreneurs and their customers, which includes tribal farmers, encouraged other community members to pursue their pathway to prosperity.

7.5.4 Awards in the Bag

CInI's non-stereotypical and sustainable innovations in the four states of the central India tribal belt, successfully making "lakhpatis", are recipients of various awards. In 2018, CInI was honoured with the National Entrepreneurship Award in the Promoters Rural Producer Group Enterprise category by the Ministry of Skill Development and Entrepreneurship (MSDE). The award recognised CInI's remarkable efforts in transforming rural livelihoods by providing improved quality inputs, establishing market linkages, and enabling access to finance through community-led organisations. Two organisations stood out in the second edition of the Samunnati and *The Economic Times* Farmer Producer Organisations Award in 2020–2021. The Murhu Nari Shakti Kisan Producer Company Ltd (MNSKPCL) received the award in the category "Mahila Sashaktikaran-East", acknowledging their dedication to empowering women in agriculture. On 28 July 2021, another FPO, Sabar AART Farmer Enterprise Producer Company (SAFE), was announced as the recipient of the Best FPO – West Region Award by Samunnati Finance and *The Economic Times*. This recognition highlighted SAFE's role as the apex community organisation under the Lakhpati Kisan Programme, operating in the tribal Khedbrahma cluster of Sabarkantha District, Gujarat. Churchu Nari Urja Farmer Producer Company Ltd. (CNUFPCL) was awarded the "Highest amount of business transaction" in the state through E-Nam on 15 August 2021. This recognition demonstrated CNUFPCL's success in facilitating significant business transactions within the agricultural sector. Additionally, CNUFPCL received the FPO Impacts Award in the "FPO of the Year, Small" category at the Livelihoods Summit – FPO Impact Awards 2021 ceremony on 17 December 2021. Murhu Nari Shakti Kisan Producer Company Ltd (MNSKPCL) also garnered recognition at the Livelihoods Summit – FPO Impact Awards 2021. They were honoured with the "Vijayalakshmi Das Friend of Women FPO Award", further acknowledging their commitment to empowering women in agriculture.

Furthermore, CNUFPCL was awarded for "Highest Digital Online Payment for Output Marketing" through E-Nam on 26 January 2022, emphasising their adoption of digital platforms for agricultural transactions. On 24 February 2022, MNSKPCL received the "Best FPO Award"

in Jharkhand, with the Chief Minister of Jharkhand gracing the occasion through an online presence. Lastly, CInI Jharkhand received the Lac Promotional Institutional Award 2022 on 27 February 2022. Presented by the Honourable Governor of Jharkhand, Sri Ramesh Bais, this award recognised CInI's valuable contributions in promoting entrepreneurship and rural development. The award ceremony was organised by the Indian Council of Agricultural Research (ICAR), Indian Institute of Natural Resins and Gums. It took place during the Kisa Mela cum Agricultural Exhibition in 2022. Furthermore, CInI's distinguished work has received recognition from the Government of Jharkhand. A Memorandum of Understanding (MoU) was signed between the Jharkhand State Livelihood Promotion Society (JSLPS), the Rural Development Department, the Government of Jharkhand, and CInI in March 2021.

Relevant for CInI, the Jharkhand Opportunities for Harnessing Rural Growth Project (JOHAR), a project developed by JSLPS for six years, was designed to increase household incomes in both farm and non-farm sectors through the formation of producer groups and organisations, diversifying the production system, involving women and smallholder households in the value chain, establishing market linkages, introducing climate-resilient production technology, enabling financial access, and connecting with the private sector, etc. The SHGs, an active component of the DAY-NRLM programme, serve as a foundation for JOHAR. The Lakhpati Kisan Programme is operational in seven blocks in Jharkhand, three of which JOHAR will foster in collaboration with CInI. The beneficiaries of these blocks, originally associated with CInI, were also evaluated as beneficiaries of the JOHAR project. Also, these very blocks will be regarded as templates for FPCs and livelihood interventions.

This collaboration is feasible owing to a similar core objective: transforming rural livelihoods by generating sustainable and irreversible income. The three blocks – HVA, livestock rearing, fishery, and NTFP – are finalised to develop the value chain. CInI's contribution is technical support, which involves employing technology to increase the project's efficacy. In addition, it shares the model of layering various interventions. The experience of five years further allowed the organisation to train the staff and CRPs associated with JOHAR. The immense scope for cross-learning means JSLPS would be privy to the initiative's interventions and related investments. CInI will also assist in matters of budgeting.

As regards human resources, CInI's staff will work with the JSLPS team for programmatic support. Alongside, owing to its extensive work in Jharkhand, materials like POPs will be provided as well. To assess the progress, CInI will employ its strong review mechanism. The monthly progress of FPCs will be assessed, a Utilisation Certificate will be submitted quarterly, the finances of the Producer Groups will be checked, and the team will

participate in review meetings at the district and state levels. The CInI team will also assist in undertaking field visits. As for JSLPS's contribution, it will provide irrigation and agriculture technologies, FPO-related training, funds, a list of PGs, etc. It will schedule timely planning meetings with CInI to ensure the appropriate utilisation of the resources in the blocks. Moreover, it will design the livelihood interventions for the three blocks after studying CInI's implementation of plans under the Lakhpati Kisan Initiative.

Banking on its experience, CInI will also assist in strategising the successful implementation of livelihood interventions for increasing the income of rural households. It will also cover the cost of manpower. Lastly, a joint committee will be formed. Its participants include the Project Director, CInI representatives, and JOHAR's thematic leads. The chairman will be the CEO of JSLPS. The purpose is to review the implementation of the interventions, assess the outcomes, and provide any additional support or guidance required.

7.5.5 Women-Led Community Building

Lakhpati Kisan Programme, by design, focused on nurturing community institutions – primarily federations of women's self-help groups from its inception. The FPO, "Murhu Nari Shakti Kisan Producer Company Limited" in Jharkhand, was registered on 5 March 2018. The current share money is Rs. 2,290,400. The villagers are actively involved in activities like high-value agriculture crops, livestock rearing, and NTFP. The BoD includes Alma Tiru, Shanti Nag, and Gomatri Mundu. The chairperson is Dayamani Nag. These women in leadership roles highlight CInI's approach to fostering gender equality.

The BoD didis regularly interact with other women from their village. They explain their work, the interventions, and agricultural technology and are actively involved in all aspects of SHG planning. Some of the tasks undertaken are regular field visits, collecting share money, noting demand for seeds, and reviewing the work of rural entrepreneurs. Working at the Panchayat level and directly dealing with the traders, they have driven their economic growth. Their success and monetary rewards have encouraged other women to become members. The acquired work satisfaction has increased their confidence, and these trailblazing women are involved in the developmental activities of their village. CInI believed in empowering the tribal communities to become the catalyst for change by spearheading their development process. This necessitated giving them ownership of the activities. Towards the end of the programme, CInI chose a village to test the exit strategy and withdrew its staff. Didis were responsible for monitoring the agricultural activities and staff like the LRPs. As the ownership was passed to the didis, their leadership skills were tested. Undoubtedly, the experiment was successful.

7.5.6 Lakhpati Kisan: The Distinguishing Factors

Most rural poor reside in the central India tribal belt (Venkatachalam et al., 2018). Out of the 50% of India's tribal population, 8.29% is found in Jharkhand, 14.69% in Madhya Pradesh, 7.5% in Chhattisgarh, 10.8% in Maharashtra, 9.2% in Orissa, 8.55% in Gujarat, and 8.86% in Rajasthan (Ministry of Tribal Affairs – Statistical Division, 2013). Poverty, food insecurity, lack of technical and scientific knowledge, seasonal employment opportunities, debt traps, outdated irrigation systems, and limited or no access to economic opportunities were the reality of their lives.

Against this backdrop, the Lakhpati Kisan Programme transformed rural livelihoods in the central India tribal belt. Firstly, a clearly defined and meaningful goal was to achieve a certain income threshold for the communities. CInI's approach entailed an in-depth understanding of the communities' economic conditions, socio-political environment, demographics, and cultural beliefs (Venkatachalam et al., 2018). This enabled the creation of community-specific interventions. Before undertaking the ambitious project of making more than 101,000 tribal households lakhpatis, another set of hard facts was considered. Not only were nearly half of these tribal communities below the poverty line, but as many as about 65% were landless. Hence, to bring these households above the poverty line, the required income was INR 120,000, as per Tata Trust and CInI research.

Lakhpati Kisan functions in partnership with the communities as opposed to other initiatives. By being community-led, the interventions are self-sustaining. The lack of dependence will ensure unobstructed functioning after CInI's withdrawal. The development of interventions was non-stereotypical. Along with community involvement, it was demand-led and market-orientated, strengthening the agricultural value chain. By fostering the evolution of women-led SHGs, federations, VOs, and FPOs, the initiative assisted the communities in spearheading their development process for holistic development. As for sustainable and irreversible income, one income source was insufficient; CInI focused on diversifying the income sources through the layering of multiple activities like farming, water entrepreneurship, lac cultivation, and livestock rearing. To foster gender equality, women were encouraged to lead the interventions or SHGs. Now, they are actively involved in the decision-making process. Acting as local influencers, they were trained to operate and propagate farming technologies, which enhanced production and increased profitability. Since 2015, CInI plugged the knowledge gap by introducing new technologies like drip irrigation, solar power, and high-tech nurseries. From staple crops like maize and rice, the farmers' focus shifted to high-value crops, including watermelon, chillies, tomatoes, etc. By building infrastructure like irrigation systems and high-tech nurseries, the community benefitted. Resultantly, productivity increased, and income growth accelerated.

A robust feedback loop has been established between households, community institutions, and CInI staff to identify problems and present solutions. This has led to the implementation of learnings in other blocks. Such a system has allowed staff to distinguish between effective and less effective interventions. The interventions were customised following the diverse geographies and specific challenges. For instance, drip irrigation systems were used in other blocks after determining their success. The initiative's funding model requires the participation of various stakeholders. As INR 65,000 per household investment was a prerequisite, Tata Trusts contributed 15–20%, and another 15–20% was the households' contribution. Funders provided 60–70%. Owing to the potential of the initiative to lift tribal communities out of poverty and facilitate economic development, CInI successfully mobilised funds from Tata Communications CSR, departments of state governments, NABARD, Infosys Foundation, E&Y Foundation, Infosys Foundation, Ford Foundation, Tata Steel CSR, and Bharat Rural Livelihood Foundation.

Solutions to financial constraints were provided through a new loan model. Avanti Finance and Rang De, along with CInI, enabled access to affordable loans. Loans by SHGs were available at low interest rates. Instead of 48% from other finance structures, SHGs kept it at 25% p.a. Additionally, the initiative supported the work of other organisations involved in similar projects. For instance, it collaborated with the World Bank's Jharkhand Opportunities for Harnessing Rural Growth Project to enhance the income for smallholder households in 65 blocks in Jharkhand. The government's plan for developing the agriculture sector focused on doubling the farmers' income by 2022 (Chand, R., 2017). This means from the baseline income of INR 30,000, it would have increased to INR 60,000 by 2022. However, by 2020–2021, through the implementation of the Lakhpati Kisan Initiative, 9,061 households were earning more than INR 100,000 p.a. Hence, surpassing the government's target, CInI successfully tripled the farmers' income in five years.

7.6 Summary and Conclusions

As a part of Mission 2020 – Lakhpati Kisan: Smart Villages, FPOs/FPCs incubating rural entrepreneurship is a growing theme that has evolved over the past few years. The introduction of rural entrepreneurship to plug multiple gaps in the value chain systems has resulted in numerous tangible and intangible benefits for rural-tribal households and communities. Apex-level institutions like FPOs/FPCs have now started to function independently to spearhead regional economic growth. Market-led production clusters established around various livelihood activities are crucial in ascertaining irreversible change and prosperity for the tribal communities. The Lakhpati Kisan Initiative has pragmatically challenged the misconception regarding the low creditworthiness of tribal communities. It has been observed that

through introducing the latest technology, training, digital literacy, and establishing credit linkages, the poorest have become entrepreneurs with a good credit score.

Further, a key differentiating factor is the focus on the involvement of women in decision-making by enabling their active participation in economic activities. This was achieved by appointing them as BODs and BOD members in FPOs/FPCs. Certainly, it provided an impetus to institutionally empower and encourage women leaders, thereby providing a conduit to break gender discrimination and foster equality. The chapter succinctly discusses the various operational microenterprise models and case studies to demonstrate the potential of upscaling them, wherein open innovation technological platforms like JharVEER play a major role in leveraging income and enhancing the quality of life for rural-tribal households and communities.

CInI has shifted the risk from smallholder farmers to entrepreneurs by promoting rural-tribal entrepreneurs. Entrepreneurship opened the gateway for introducing and customising the latest world-class technology as per the local context, which proved confidence-inducing for the rural-tribal farmers. Their risk-taking ability reaped rich dividends. The demonstrated success experienced by the entrepreneurs and their customers motivated other community members to pursue their pathway to prosperity. Instead of treating the rural communities as mere beneficiaries, the initiative partnered with them. Hence, the demands of niche market customers were met through micro-enterprise models such as fish cultivation. The rewarding partnership forged by CInI enabled the positioning of the entrepreneurs to cater to specific preferences. The demonstrated success, as experienced by the entrepreneurs and community-based institutions, has motivated other community members to join and empower themselves. Specifically, women were encouraged to participate in economic activities and even lead the apex institutions. This has ensured that they play a significant role as "Change Agents" and break the gender stereotypes carried over the years.

Particularly, for policymakers and researchers alike, it is imperative to acknowledge that rural communities cannot be broadly categorised as farmers. A misconception of this kind can restrict the creation of employment-generation activities. The Lakhpati Kisan Initiative has pragmatically challenged this misconception. It was observed that through introducing the latest technology, training, digital literacy, establishing credit linkages, etc., the poorest communities have become entrepreneurs with good credit scores. As the apex-level institutions perform multiple roles in the ecosystem of rural entrepreneurship (like negotiating with the market players for price realisation, providing farm inputs to the farmers via entrepreneurs, selling farm produce to SMEs, etc.), CInI should endeavour to sensitise regarding the benefits of agroecological practices and adverse effects of chemical-intensive farming. These orientations must be supplemented by demonstrating and sharing

healthy farming practices like organic farming, agroforestry, and cultivating geography-specific crops. Lastly, the networking of institutions and entrepreneurs via platforms like JharVEER should be digitally leveraged to seize the market of low chemical crops and processed products in the near future.

Box 7.1 Churchu Nari Urja FPC: Structure and Success

Churchu Nari Urja Farmer Producer Company Limited is an Indian non-government company classified as "company limited by shares". It is registered under the Companies Act 2013, under ROC-Jharkhand, and its date of incorporation is 6 June 2018. It operates in two blocks, Churchu and Dadi, of the Hazaribagh district in the state of Jharkhand, with a farmer base of 7,000 households. Its Corporate Identification Number is (CIN) U01110JH2018PTC011479 and its registration number is 11479. Its email address is churchunariurjafpc@gmail .com.Churchu Nari Urja Farmer Producer Company Limited's Annual General Meeting (AGM) was last held on 29 September 2023, and as per records from the Ministry of Corporate Affairs (MCA), its balance sheet was last filed on 31 March 2023. Its authorised share capital is Rs. 50.0 lakhs, and its paid-up capital is Rs. 25.12 lakhs (share capital). CNUFPCL has a shareholders base of 3,138 shareholders, all of whom are 100% women, and has a Board of Directors (BOD) of 12, all of whom are all women members. The directors' names are Rita Devi, Sudha Devi, Lalmuni Marandi, Sumitra Devi, Alka Devi, Basanti Devi, Savita Kumari, Kanchan Devi, Vina Devi, Soniya Devi, Maya Devi, and Malti Devi.The company is involved in agriculture and allied activities business and provides various services to its shareholders, such as quality inputs, market linkages, crop advisory services, government advocacies, rural entrepreneurship, custom hiring services, and health services (MHM and cancer care) etc. The major products of CNUFPCL are soilless saplings, T&D piglets, lac handicrafts and bangles, etc. Related to these services and products, a total of 43 rural entrepreneurs have been developed so far.

The company has all the major licences and certificates like seed, fertiliser, pesticide, GST, and MSME, which helps in providing all input services to its shareholders. Some partnerships and dealerships/distributorships with Mother Dairy, E-Nam, Dehaat, TRIFED, IINRG, Jhascolamph, Selco Foundation, BAYER Crop Science, Seminis, Syngenta, Kaveri, NSC, BASF-Nunhems, Godrej Agrovet, and Nilkamal for input and output marketing have been aligned with them. Major financial partners of the company are JRG Bank, HDFC, UCO, BOI, and Samunnati. JRG Bank has provided a CC limit of Rs. 30 lakhs for its regular business. CNUFPCL has shown substantial growth in its annual turnover, with year-on-year projections as follows: FY 2018–2019: 0.35 lakhs; FY 2019–2020: 103 lakhs; FY 2020–2021: 184 lakhs; FY 2021–2022: 210 lakhs; FY 2022–2023: 254 lakhs.

CNUFPCL has been awarded the following recognition for its outstanding work: Awarded the "Best FPO of the Year-Small" by Livelihoods

India Summit 2021, awarded by JSLPS for the "Best FPO for Doing Highest Output Marketing Using Digital Platforms" in 2022, and awarded and recognised by Bazaar Samiti, Hazaribagh (APMC), as the "Best FPO in Hazaribagh District for Highest Output Marketing (Paddy & Tomato) through E-Nam" for the financial years 2020–2021, 2021–2022, and 2022–2023.

Note

1 Karnal Model became popular as a part of the Centre of Excellence for Vegetables Indo-Israel Project, wherein protective cultivation of crops is done using naturally ventilated polyhouse nurseries and anti-insect nets. It is a cost-effective method to produce good quality seeds and crops.

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8

CULTIVATING SUCCESS

Translating Lakhpati Kisan Outcomes into Action for Sustainable Livelihoods and Meeting Aspirations

Ashwini Chhatre, Anjal Prakash, Ganesh Neelam, Sujit G Kumar and Apurva Duddu

8.1 Introduction

This concluding chapter focuses on the key learnings from the Lakhpati Kisan Initiative, which seeks to meet the aspirations of smallholder farmers in central Indian states. The project's core is to increase farmers' income and standard of living. The significant findings and insights from the earlier chapters are reflected on in this chapter to develop a coherent story and synthesised knowledge of the Lakhpati Kisan project.

There are four sections in this chapter. First, we review and synthesise the preceding chapters' most important findings, actions, interventions, and results. It seeks to give readers a comprehensive grasp of the project and a smooth narrative. This chapter emphasises the importance of the key concepts covered throughout the book, including the activities, interventions, and results, and detects emerging patterns by reflecting on those concepts.

Second, we acknowledge the drawbacks of the current study's approach and offer prospective directions for further analysis and research. This conversation allows future initiatives to surpass these constraints and increase our knowledge and comprehension. Third, we list concrete takeaways from the interventions and activities of the Lakhpati Kisan Initiative. These lessons offer important insights for future initiatives of a similar nature, including useful advice and information that might help make such projects successful.

Finally, we provide actionable recommendations for professionals and decision-makers interested in implementing such initiatives. These suggestions fill the gap between the descriptive nature of the chapters and the actual implementation of the project's findings, offering useful advice for applying the findings to actual practices. It is an important tool that provides

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useful suggestions and methods for anyone looking to replicate and modify effective strategies for their projects or programmes.

8.2 The Lakhpati Kisan Initiative: Transforming Rural Livelihoods and Fostering Sustainable Development

India's economic growth and development are characterised by notable inequalities, with a wide disparity in income distribution among sectors. The rural-urban gap is exacerbated because the agriculture industry, which employs between 40 and 60% of the workforce, only contributes 3.4% to GDP growth. Food output improved as a result of the Green Revolution. Nevertheless, the advantages of the Green Revolution were mostly found in irrigated areas, leaving rainfed farming regions with small landholdings dealing with growing input costs and unpredictable rainfall.

India's central tribal region, known for its abundant natural resources, is nevertheless underdeveloped and destitute. Regarding important development indicators like poverty rates, literacy, infant mortality, and life expectancy, this region, which is home to 72.25% of India's tribal people, falls behind. The Indian government, realising the need for change, put forward an ambitious plan to double farmers' income by 2022, concentrating on aspirational areas with subpar socioeconomic indices.

In response, the Lakhpati Kisan Initiative was conceptualised by Tata Trusts and its affiliated organisation, Collectives for Integrated Livelihood Initiatives (CInI). The programme started in 2015 and aims to deploy a high-impact development approach to make 101,000 rural households, primarily tribal communities, permanently prosperous. Since the early 2000s, Tata Trusts has been involved in the central tribal belt through targeted grants and research initiatives. Significant results from their earlier programmes included a 100% to 200% increase in staple crop output, bringing food security, increased education spending, and better household incomes. Through multiple interventions in agriculture, livestock, irrigation, and women's empowerment, the Lakhpati Kisan Initiative benefits farmers, especially small and marginal landholders. The programme aims to solve issues facing Indian agriculture, such as low production, the effects of climate change, and limited market access.

The Lakhpati Kisan Initiative was introduced, building on this experience and utilising the knowledge and experience from earlier initiatives. The chapter offers a road map for the programme, detailing its impact monitoring system and the intended household income targets. The Lakhpati Kisan Initiative is a targeted initiative to address the stability of farmers' incomes in the central tribal belt. The effort seeks to improve rural families, combat poverty, and promote sustainable development by executing targeted interventions and drawing on knowledge from earlier projects.

One of the main conclusions is how vulnerable traditional farming methods are to climate change in rainfed areas. Erratic rainfall patterns, frequent droughts, and rising temperatures negatively impact crop production and livestock health. The livelihoods of rural populations and the security of the food supply are at risk. The Lakhpati Kisan Initiative is aware that these problems require long-term solutions.

Farmers' incomes have increased and their standard of living has improved thanks to the initiative. By implementing better agricultural techniques and technologies and diversifying their crop portfolios and allied livelihoods, farmers have increased yields and gained access to better markets. Initiatives for managing water and raising livestock have also enhanced incomes and resilience. The initiative also strongly emphasises gender equity and women's empowerment, with a focused engagement with women and, through them, their families. Women-run community organisations are essential for fostering agriculture-based livelihoods and guaranteeing family well-being. Women have been encouraged to participate in decision-making processes and have had their capabilities enhanced to lead the action on the ground through their institutions. The Lakhpati Kisan Initiative supports the Indian government's goal of doubling farmers' incomes by implementing reform measures and emphasising market connections. The programme promotes community-based organisations and sustainable business channels for rural areas.

In sum, the Lakhpati Kisan Initiative uses agriculture, livestock, irrigation, non-timber forest produce, and women's empowerment interventions to tackle the problems that smallholder farmers in central Indian states face. The programme's objectives include raising farmers' incomes, enhancing their standard of living, and fostering climate change adaptation. We can comprehend the relevance of the programme's activities and their effect on farmers' lives by considering the main conclusions and observations.

8.3 Limitations and Future Directions: Expanding the Scope of the Lakhpati Kisan Initiative

While the Lakhpati Kisan Initiative documentation offers insightful information on the programme's efforts and results, it's crucial to recognise the limits of the existing research design. By identifying these constraints, future study and analysis can be guided, providing new opportunities for fieldwork.

The current study's dependence on participant testimonies from the past and self-reported data is one of its limitations. Although the programme's management information system and interviews with community members were used to collect information, there may still be certain gaps in the accuracy and dependability of the information. Future studies might use more reliable data collection techniques, including longitudinal studies or

randomised control trials, to produce more accurate and impartial evaluations of the programme's effects.

Lakhpati Kisan is an approach, just like doubling farmers' income, and it has applicability across the country but with a focus on local contextualisation depending on certain parameters. The Lakhpati Kisan Initiative was undertaken in four states in central India. Therefore, it is possible that the results cannot be properly extrapolated to other locales or populations. Future studies should examine the applicability and efficacy of such interventions in various contexts, such as socio-cultural settings or agro-climatic zones. The initiative mainly concentrates on the programme's results and immediate effects on farmers' income and livelihoods. The underlying mechanisms and processes causing these effects should be better understood in future studies. This could entail looking into elements that contribute to the success of interventions to enhance smallholder agriculture, such as the function of social networks, institutional support, or policy frameworks.

Additionally, the current study focuses particularly on the agricultural and allied sectors and their connections to improving the standard of living. Future studies can examine the Lakhpati Kisan Initiative's broader socio-economic and environmental impacts. This can entail looking into how the programme affects objectives for sustainable development, natural resource management, poverty reduction, and food security.

The Lakhpati Kisan Initiative must be continuously monitored and evaluated to determine its long-term effects because it is an ongoing programme. Future studies should evaluate the interventions' viability and scale, looking at their effects beyond the project's scope and considering ways to replicate and scale them up in different areas. Although the current study offers insightful information about the Lakhpati Kisan Initiative, it is vital to recognise its limits and think about possible directions for future research. We can improve our understanding of interventions to boost smallholder agriculture and contribute to creating sustainable and inclusive rural livelihoods by addressing these constraints and investigating new avenues.

8.4 Lakhpati Kisan Programme: Insights for Future

While it may not be possible to generalise from the Lakhpati Kisan Initiative chapters, unique lessons may be learned from the programme's activities and interventions. Even though they do not immediately contribute to a more thorough examination of how to raise farmers' incomes, these lessons are still important for future projects of a similar nature.

8.3.1 Importance of Context-Specific Interventions

The importance of adjusting interventions to the particular needs and difficulties of the target communities was acknowledged by the Lakhpati Kisan

Initiative. The programme focused on filling gaps in the agriculture, livestock, and NTFP (lac) value chains while considering agro-climatic factors, market preferences, and existing value chains to identify context-specific winner crops. This lesson emphasises how critical it is to comprehend the local context when developing treatments that will effectively address the unique problems that farmers may encounter.

8.3.2 Integration of Technological Innovations

The programme strongly emphasised incorporating technical advancements to advance agricultural practices and boost productivity. The effort showed how technology can help enhance yields and revenue by promoting better seeds, effective irrigation systems, and contemporary farming methods. This lesson emphasises the importance of including suitable and affordable technologies in agricultural interventions, allowing farmers to use the advantages of innovation for sustainable lifestyles.

8.3.3 Empowerment through Community Institutions

The Lakhpati Kisan Initiative placed special attention on women-run community organisations and their function in fostering transformation. The initiative promoted gender equity and gave women the tools to effectively engage in decision-making by involving them and enhancing their capacities. This lesson emphasises the critical role that community-based organisations play in fostering social resilience and developing a climate conducive to sustainable agricultural development.

8.3.4 Holistic Approach to Livelihood Enhancement

The Lakhpati Kisan programme adopted a holistic approach, recognising the intricate relationships between livestock management, agriculture, water resource management, and women's empowerment. Understanding the interdependence of these factors, the initiative aimed to create sustainable income avenues by comprehensively addressing all aspects of rural life. This approach underscores the significance of integrated interventions that account for the diverse nature of rural livelihoods, working towards their substantial improvement.

The programme engaged actively with natural resources, promoting responsible practices to ensure the long-term viability of agriculture. The programme aligned itself with environmentally conscious practices through initiatives like creating irrigation structures and introducing sustainable energy solutions such as solar pumps and panels. This approach increased agricultural productivity and fostered resilience in changing climatic conditions.

Furthermore, the programme collaborated with government institutions and external actors to maximise its impact. By working closely with agricultural cooperatives and facilitating easy access to credit, the programme leveraged existing structures to empower farmers. The engagement with external actors, including training rural tribal entrepreneurs, demonstrated a commitment to building capacity and creating a network of skilled individuals who could contribute to the programme's success. Overall, this multifaceted engagement with natural resources, government institutions, and external actors showcases the programme's comprehensive strategy to uplift rural communities and establish sustainable livelihoods.

8.3.5 Community Ownership and Participation

The Lakhpati Kisan Initiative highly valued community ownership and involvement. The initiative promoted a sense of ownership and sustainability by including community members in decision-making, encouraging active engagement, and fostering local business. The necessity of community involvement in the planning, carrying out, and monitoring of projects is stressed in this lesson since it increases their chances of success and long-term effects.

While it may not be possible to generalise from the Lakhpati Kisan Initiative chapters, certain lessons can be taken away from the programme's activities and interventions. These lessons emphasise the value of community ownership and involvement, context-specific interventions, the incorporation of technological advancements, empowerment through local institutions, and holistic approaches to livelihood promotion. By applying these lessons to upcoming initiatives, stakeholders can improve the efficiency and sustainability of comparable projects to improve farmers' livelihoods.

8.5 Implementing Successful Agricultural Interventions: Eight Lessons from the Lakhpati Kisan Initiative

This section summarises the recommendations for practitioners or policymakers interested in implementing such interventions. These suggestions are meant to fill the gap between the chapters' descriptive style and the project's results' actual practical use.

The first lesson is to contextualise interventions. Each context is different. One must tailor interventions to the target population's unique needs and difficulties. For this, make a detailed analysis of the local context, considering market preferences, agro-climatic variables, and current value chains. By addressing the unique needs of farmers, interventions will be relevant, efficient, and sustainable.

Second, we must promote technological innovations. One should accept that technologies can improve production and farming operations. To raise yields and income, we should promote better seeds, effective irrigation systems, and contemporary farming practices. To ensure farmers' successful adoption of new technology, make it easier for them to obtain these technologies and offer them help and training. Efforts should be made to build up the network of rural entrepreneurs by addressing the value chain gaps and creating nursery and goat entrepreneurs, etc. Similarly, there is the need to address the knowledge gap at the farmer level, which was attempted through the pool of trained local extension volunteers.

Third, we must foster community ownership and participation. The focus is on local ownership and involvement throughout the project's execution. Engage residents in decision-making processes, encourage active participation, and foster local businesses. As a result, the community will develop a sense of empowerment, sustainability, and ownership, assuring the intervention's long-term effectiveness. There is a need to build up the working capital of the institutions, blended finance, risk cover, and convergence with the mainstream developmental schemes.

Fourth, there is a need to strengthen women's empowerment. For this, we must *recognise* the crucial part that women play in rural life and agriculture. Invest in programmes that help women expand their skills, encourage them to take on leadership roles in local organisations, and give them opportunities to earn money. Address gender-based restrictions and ensure equal access to resources, knowledge, and decision-making authority.

Fifth, the intervention needs a holistic approach. Achieving this means adopting a holistic strategy acknowledging the connections between farming, raising livestock, managing water resources, and other related livelihoods. Create interventions targeting various areas of rural livelihoods to build long-term avenues for generating revenue and enhancing well-being. To maximise effect and efficiency, encourage sector integration and collaboration.

Sixth, establishing market linkage is paramount to guaranteeing fair prices and access to larger markets and creating strong market ties for farmers' produce. Promote market education and training on market-driven production, high standards of quality, and post-harvest administration. Boost cooperatives and organisations for farmers and producers to provide collective marketing and bargaining strength.

Seventh, we must promote knowledge exchange and learning. This will help create venues for farmers, practitioners, and policymakers to share knowledge and learn. Share success stories, lessons learned, and best practices to promote innovation and continual improvement, to promote evidence-based decision-making and policy formation, and to foster collaborations with academic institutions, research organisations, and other stakeholders.

Lastly, we must monitor, evaluate, and adapt to the new changes. To achieve this, we must create effective mechanisms for monitoring and evaluating initiatives' progress, effects, and results. Assess the intervention's efficacy and efficiency regularly and adjust as needed in light of feedback and lessons learned. To make future interventions more effective, always learn from the successes and difficulties encountered during implementation.

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