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DEVELOPMENT OF CAPITALS AND CAPABILITIES OF SMALLHOLDER FARMERS FOR PROMOTING INCLUSIVE INTENSIFICATION IN AGRICULTURE: EXPERIENCES FROM NORTHERN WEST BENGAL, INDIA

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Abstract

While policies and institutional arrangements aimed at intensification and growth of the Indian agriculture sector are inevitable for the livelihoods and food security of the country's vast population, the inclusion of land-constrained farmers especially women, therein requires certain fundamental changes in the approaches. Efforts toward such changes based on a deeper understanding of the underlying issues and dynamics seem to be more pertinent, particularly at the onset of various crises in the sector and measures undertaken by the government to address the same. This paper analyzes the experiences of interventions in two selected villages in West Bengal and the subsequent changes in farming practices by land-constrained farmers therein to design a framework aimed at strengthening the institutional approach. Using insights from focus group discussions, open interviews, field observations, and repeated engagement with the stakeholders, this paper argues that while collectivization of resources and actions can potentially lead to the inclusion of smallholder farmers and women in the intensification process, benefitting from the opportunities under the changing socioeconomic environment would require the development of the necessary capacities and capabilities of the farmers. Further, such capital formation and capability building through the process of ethical engagement with the community would also be crucial to overcome various constraints, particularly with regard to the scale of farming, market access, bargaining power, and risk-bearing ability. Nevertheless, continuation of the supporting incentives and related institutional reforms would be essential in this regard.

Keywords: institutions, policy, collectivization, smallholders, sustainability, agriculture, West Bengal, India

JEL Classification: Q1, O13, I3, H8

Contents

1. INTRODUCTION

While policies and institutional arrangements are inevitable to address the prolonged crises in Indian agriculture, the issues relating to the livelihoods and food security of its vast population, including the land-constrained farmers and women, require special attention. This is crucial for accelerating the transformation process in rural India as these vulnerable sections account for a significant portion of the rural population, but are characterized by limited capacity and capabilities. In addition, limited access to protective irrigation coupled with imperfections in the markets and weak institutions often make the problems more complex. This is more so with increasing production and market-related risks, primarily because of climate change and other external shocks. Thus, achieving inclusive agricultural intensification at the community level at present as well as in the future (sustainable across generations) would require addressing the externalities and trade-offs associated with soil and water resources, and agro-biodiversity, along with the market-related aspects.

In this context, it is often suggested that accelerating the growth of the Indian agriculture sector and making the intensification inclusive and sustainable would require emphasis on the development of the necessary infrastructure, the promotion of value chains and entrepreneurship, and facilitating free movement of farm produce and exports, along with conservation and judicious use of critical natural resources and the promotion of a climate-smart approach to agriculture. While many of these measures are seen largely in the context of the failure of the existing system of minimum support price (MSP) and the government's procurement through the Agricultural Produce Market Committee (APMC), it is not clear whether they would necessarily promote inclusiveness of the growth process, particularly when there is a significantly high number of land-constrained farmers. Importantly, the inclusiveness of interventions has been the subject of discussions and debates for a number of years (i.e., Majumdar 2021; Bhoi and Dadhich 2019; Singh 2019). It is argued that government procurement and the MSP are biased in favor of cereals such as paddy and wheat. Further, small marketable surpluses of land-constrained farmers and high transaction costs associated with market access often exclude these stakeholders from the benefits of the MSP. Similar apprehensions and concerns are raised even when market-oriented policy suggestions are made, as it would be difficult for the smallholder farmers to bargain effectively with the big corporate houses, given that they often fail in negotiating even with the middlemen and local traders (Ranjan 2017).

However, what is more critical is that the land-constrained farmers lack the necessary capacity and capabilities to reap the benefits of government interventions in activities ranging from input sourcing to selling the produce and enhancing their competitiveness. Given that the small scale of farm operations (along with high input costs and limited use of modern technologies) often results in rising average costs of cultivation, inadequate access to, and a lack of bargaining power in, output markets would make agriculture further unviable for this farming group (Agarwal 2010). The conditions are likely to be more critical with limited access to critical inputs like irrigation and credit (Dev 2018), poor extension services, and both an inadequate infrastructure and unsatisfactory adoption of technology (Sharma 2013). Since these aspects are linked closely with policies and institutions contributing to a deceleration in Indian agriculture (Behera and Mishra 2007), revisiting the intervention strategies and institutional approaches to overcome these constraints is imperative. In particular, emphasis is required on enhancing the capacities and capabilities of the land-constrained farmers to strengthen their competitiveness, bargaining power, and market position so that they can effectively use the infrastructure facilities, participate and

survive in value chains, gain access to markets, and contribute to judicious use and conservation of critical natural resources through appropriate farming practices.

Thus, the key challenge in the Indian agriculture sector is the inclusion of smallholder farmers in the process of intensification, productivity enhancement, and growth acceleration. Nevertheless, while one can see the underlying dynamics in the context of the existing debates on farm size and productivity (e.g., Saini 1971; Srinivasan 1972; Bardhan 1973; Chadha 1978; Carter 1984; Chattopadhyay and Sengupta 1997; Chand, Prasanna, and Singh 2011; Rada and Fuglie 2019), there is also a need to understand the issues relating to enhancing the capacities and capabilities of the land-constrained farmers and the roles of markets, policies, and institutions for the same. This is crucial in the Indian context as the smallholder farms can potentially provide viable livelihood opportunities and ensure food security for the large majority (Imai, Gaiha, and Garbero 2014) even when the large commercial farms have greater economic efficiency (Collier and Dercon 2014). Moreover, the Agricultural Census of the Government of India reports a decline (though marginal) in operational landholding across different farm sizes (Table A1 in Appendix 1), possibly because of further fragmentation of land owing to an increasing population, the division of families, and the use of farmland for other activities. About 96% of holdings belong to the small and marginal farmers, with an average operated area per holding of a mere 0.64 hectares in 2015–2016 in West Bengal, whereas they are 87% and 0.58 hectares, respectively, for India in the same year.

With about 96% of landholders being marginal and small in size, emphasis on raising farm productivity and income is, therefore, imperative. This requires an inclusive approach to the process of intensification in the sector, which in turn depends on access to important capital (social, economic, financial, natural, human, and political) and the development of capabilities by these smallholder farmers. Further, the sustainability of the process would depend on community-supported initiatives, such as organic farming, water management institutions, the development of localized market access and value chains, and generating off-farm livelihood opportunities (Bisht, Rana, and Ahlawat 2020) along with the related policies, leadership, legislation, civil society participation, and sector-specific decision-making (Sidaner, Balaban, and Burlandy 2012). Nevertheless, there are potential trade-offs between inclusiveness and sustainability, and balancing these would require land-constrained farmers to possess the necessary capacities and capabilities.

Hence, efforts towards the development of the necessary capitals and capabilities of this farming group are necessary to mitigate climatic risks, adopt new technologies and farming practices, participate in value chains, and access input and output markets. In addition, the development of such capitals and capabilities is also necessary to cater to diverse agro-climatic and socioeconomic conditions, differences in individual knowledge and skills, heterogeneity in resource endowments, and information asymmetry. However, the important question is, what pathways should be followed in this direction? Can collectivization of the land-constrained farmers and their integration into institutions like the farmer producer organizations (FPOs) help in overcoming their scale disadvantages and other risks? How can the required capitals and capabilities be developed given the changes in production relations and market dynamics?

This paper explores the development pathways of individual and social capitals and capabilities through engagement with the smallholder farming community and their collectivization to promote inclusive and sustainable agriculture. The main objectives of the paper, therefore, include:

i) To examine how the engagement with the farming community and other stakeholders and various interventions can result in the development of individual and social capitals and capabilities

ii) To understand how such capitals and capabilities of the farmers can bring in changes in the farming practices and socioeconomic conditions of the land-constrained farmers

iii) To design the potential pathways that would help to overcome the constraints to the existing approaches and facilitate the development of the necessary capitals and capabilities towards the promotion of inclusive and sustainable intensification in the sector

Here, agricultural intensification refers to the process of multiple cropping along with increasing land productivity through intensive use of high-yielding variety seeds, sophisticated equipment, machines, fertilizers, pesticides, irrigation, etc. The additional benefits generated in the process of agricultural intensification are, for the most part, captured by the affluent classes leading to the deprivation of the marginal and poor farmers. Hence, there is a need for inclusive intensification by incorporating the disadvantaged class of farmers, such as the smallholders, the landless, and women, into the process. In addition, the intensification process needs to be sustainable so that the resource base is not depleted and the process of intensification can continue in the long term (see siagi.org/about-siagi/). Accordingly, in the present context, the issue of sustainability calls for the continuation of the process of intensification by the land-constrained farmers through changes in farming practices (i.e., choice of appropriate crops, technologies, etc.) with adequate emphasis on the conservation of critical natural resources.

The paper is based on the experiences of various interventions under a specific project (SIAGI).[1] More specifically, the paper addresses the above objectives using the insights and experiences of collectivization from two selected villages in West Bengal, India. Uttar Chakoakheti (UC) in the Alipurduar district and Dhalaguri (DG) in the Cooch Behar district under the SIAGI project. In both villages,[2] the collectivization of smallholder farmers is considered an institutional arrangement that facilitates participation in collective farming and integration with other institutions. The SIAGI project was focused on expanding social inclusion by engaging with the landless and marginal farmers, including women, and the tribal community.

2. DEVELOPMENT OF CAPITALS AND CAPABILITIES: ANALYTICAL FRAMEWORK

Existing studies suggest that inclusive growth and poverty alleviation require greater opportunities for and participation of the poor in various economic activities (Subramanyam et al. 2011; Wuyts 2011). Further, inclusion should also be combined with social justice, particularly when individual or household characteristics cause entitlement failures (Dreze and Sen 1990; Burchi and De Muro 2016). This is crucial to ensure that there are opportunities for all, and fair allocation of resources and distribution of benefits is carried out. However, achieving these objectives would

[1] Here, SIAGI refers to the collaborative research project "Promoting Socially Inclusive and Sustainable Agricultural Intensification in West Bengal (India) and Bangladesh" sponsored by the Australian Centre for International Agricultural Research (ACIAR), Government of Australia. The details on this project are available at http://siagi.org.

[2] These two villages were chosen for interventions conducted under the SIAGI project.

require the presence of appropriate institutional support (Acemoglu and Robinson 2012; Mishra, Behera, and Nayak 2010), and the Indian agriculture sector seems to be considerably lacking in this regard. Even the existing institutions have failed to accelerate the growth of this sector (Behera and Mishra 2007).

In this context, it is often argued that group farming as an institutional arrangement can potentially help smallholder farmers to overcome technology, scale, institutional, policy, and other related constraints. However, the international experiences (Liu et al. 2017) as well as those in the Indian context (Agarwal 2018) are mixed in this regard. For example, group farms have performed better than individual male-dominated farming in Kerala, whereas the experience is different in Telengana, largely on account of differences in the institutional approaches toward addressing the technology gaps and group heterogeneities. Experiences are different in respect of the provision of cheaper finance and also the focus on specific crops. In particular, a focus on cash crops results in better outcomes of group farming vis-à-vis traditional crops (Agarwal 2018). Nevertheless, even group farming may not necessarily reach the critical scale when landholding is highly fragmented. As a result, groups may have higher productivity but may not necessarily be profitable due to higher average costs. Further, with high-value cash crops having higher perishability, their market-related risks also increase. Hence, when the groups lack the capacity and capabilities to mitigate such risks, they may become vulnerable.

Furthermore, inclusive intensification in the Indian context requires adequate space for women in the agricultural landscape, particularly considering that the participation of the female workforce is largely limited by various social institutions (The World Bank 2011). For example, in traditional societies, women have relatively less presence in the labor market (Rangarajan, Kaul, and Seema 2011), and their participation in farming is often distress-driven rather than voluntary (Bhalotra and Umana-Aponte 2010; Himanshu 2011; Eswaran, Ramaswami, and Wadhwa 2013; Pattnaik and Lahiri-Dutt 2020). It is also seen that improvement in a household's economic position generally reduces female participation in the workforce (Sen and Sen 1985; Baliyan and Kumar 2014). Overall, women's participation in agriculture is determined by family income, migration of the male workforce, caste category, and landholding size (Pattnaik and Lahiri-Dutt 2020), along with other socioeconomic, demographic, cultural, and institutional factors.

Consequently, despite their immense contribution to the rural economies in general, and the agriculture sector in particular (Rao and Shenoy 2004; Doss 2011), women have limited power to make decisions (Ashby et al. 2009). Existing studies (e.g., Abraham 2009; Chowdhury 2011) also show the disadvantages of women with regard to benefits and property rights. Furthermore, often they are engaged in labor-intensive work (Rao 2011), depending on their education level and age (Klasen and Pieters 2013) as well as other human and social capitals.

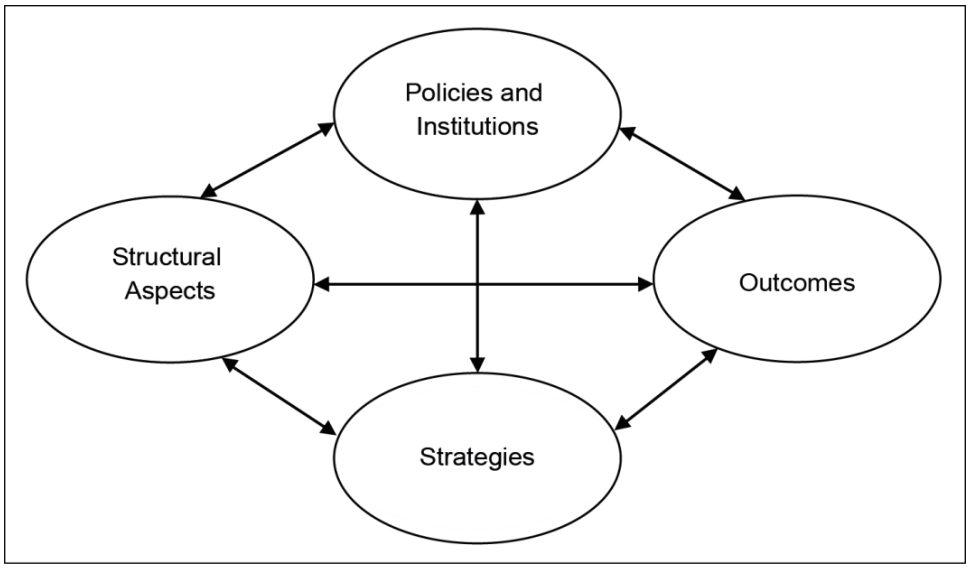
Nevertheless, the deepening agrarian crises in India and consequently forced migration of the male workforce for in search of alternative livelihood opportunities (Agrawal, Chandrasekhar, and Gandhi 2015; Dev 2012; Eapen and Nair 2015) have created additional space for the engagement of the female workforce in farming, particularly during the Rabi season. More specifically, the use of family labor in smaller farms for the cultivation of Rabi crops has increased women's participation therein (Saikia 2004). However, the sustenance of such engagement and the socioeconomic empowerment of women requires the development of the necessary social and human capitals and capabilities. Evidence suggests that group farming improves women's necessary skills, which subsequently help in their individual farms as well (Agarwal 2018), leading

to empowerment. This is crucial given the limited access to resources and the high incidence of poverty (Agarwal 2014).

Based on these insights from the literature and field experiences, the following schematic framework is conceptualized for this paper (Figure 1). This framework is adapted from the structure–conduct–performance (SCP) framework, which was propounded by Bain (1956) and is used extensively in industrial organization. Here, it is hypothesized that the outcomes of different interventions would depend on how various structural (geophysical, agro-climatic, socioeconomic, and demographic) aspects are integrated with policies and institutional setups, farming practices, and other strategies. The linkages (both intra and inter) across various aspects are often multidirectional, making the cause and effect relationships very complex and dynamic. Hence, given the structural aspects, farmers' strategic responses to government interventions and the subsequent outcomes would eventually require continuous efforts to be made towards the development of necessary capitals and capabilities, along with the creation of different assets to withstand shocks and uncertainty.

In this context, the sustainable livelihood approach (SLA) framework of the Department for International Development (DFID) provides a simple but holistic model for addressing these complex issues. It is also useful for designing developmental programs and their assessment framework (DFID 1999) along with engagement with the target groups. The SLA framework depicts the details of various capitals that are important for facilitating sustainable livelihoods. Broadly, these capitals are classified as natural, financial, social, human, and physical.

Figure 1: Basic Analytical Framework

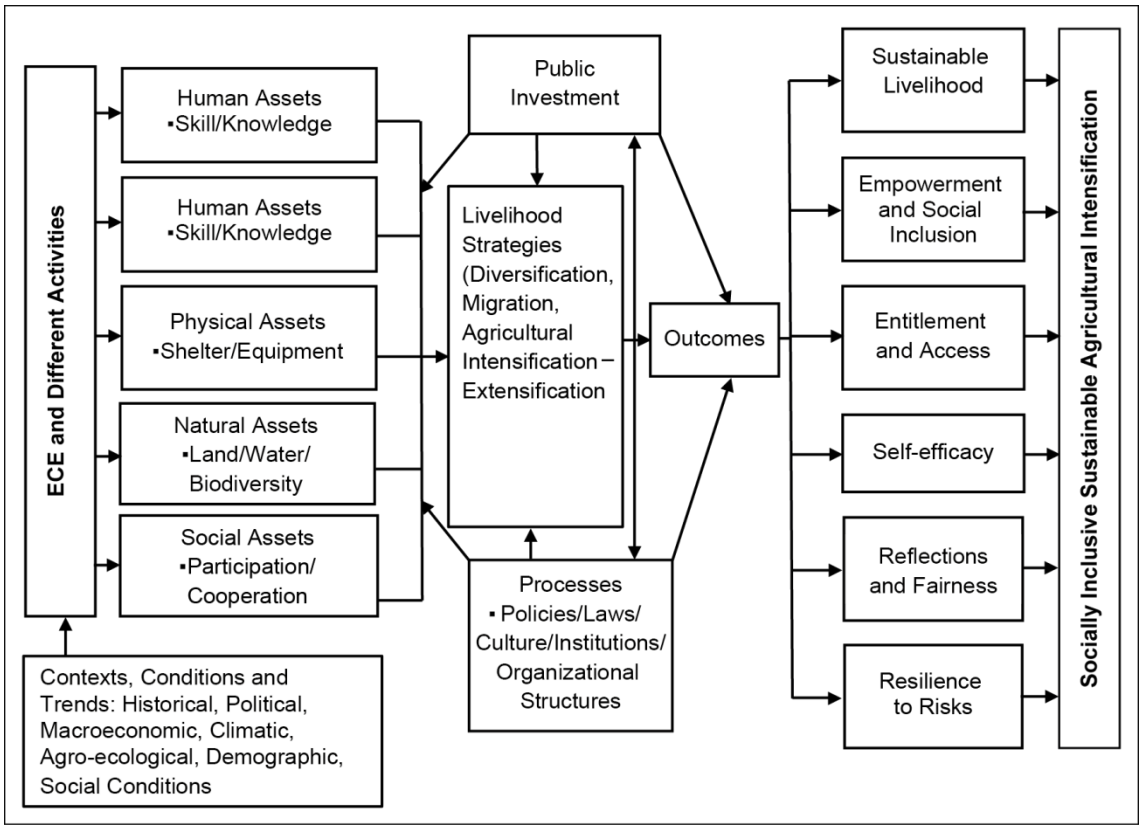


Source: http://siagi.org.

However, according to Scoones (2009), there are a few inherent shortcomings of the SLA framework, and sustainable livelihoods cannot be achieved with interventions in isolation of political, historical, macroeconomic, climatic, agro-ecological, and social conditions. Therefore, it is also necessary to include livelihood strategies—such as intensification-extensification in agriculture, diversification of livelihoods, and migration of the workforce—in the framework to bridge the gaps between the capitals developed and the outcomes achieved. In addition, there are also difficulties in executing the SLA framework in practice (Batterbury 2008).

Based on the SLA of the DFID (1999) and suggestions by Scoones (2009), the modified framework (Figure 2) is used here as it comprehensively links the capitals and capabilities to the desired changes in addition to addressing the potential shocks and the underlying risks. The framework as presented in Figure 2 is modified further based on insights from Mishra et al. (2017) and experiences taken from the SIAGI project. More specifically, the proposed framework looks beyond income or returns from agriculture to understand the underlying issues in achieving inclusive and sustainable agricultural intensification. Given the policies and formal institutional setup, interventions in the sample villages were aimed to fine-tune informal institutional norms and farming strategies, build new institutions such as collectives, and explore further opportunities. Accordingly, the focus was on designing the pathways and outcomes of community engagement and other interventions through the market–policy–institution interface.[3] Thus, the framework presented here can potentially analyze the dynamics of the different types of capital and at different scales (e.g., at household, community, or village levels).

Figure 2: Conceptual Framework for Community Engagement and Socioeconomic Resilience: Sustainable Livelihood Approach



Source: Based on DFID (1999), Scoones (2009), and Mishra et al. (2017).

[3] Here, the outcomes are defined in terms of: social, economic, and ecological benefits; fairness/equity in interventions; access to resources, opportunities, distribution of benefits; and empowerment, including entitlement, dignity, and efficacy. For example, the process of repeated engagement and facilitation under SIAGI enabled farmers to obtain caste certificates, subsidized inputs, and also submersible water pumps under ongoing government schemes. Such efforts of linking the community with different stakeholders helped them to achieve their entitlements.

Figure 2 presents the SLA framework and its applicability to community engagement and resilience. It is envisaged that the design and implementation of interventions through community engagement would help in forming various capitals and reaping the benefits. In addition, farmers' willingness to participate in the process and their capabilities to deal with the changes are also crucial in this regard. However, the larger set of factors influencing the changes may vary across the geographical locations, social structure, and economic conditions of the community depending on institutional efficiency, particularly of those institutions functioning at the local level.

Thus, we assume that households' willingness and ability to respond to the interventions depend largely on their access to the capitals (and hence their capacities and capabilities), which can be developed through community engagement and other interventions (Figure 2). These capitals, in combination with public investment for infrastructure development, capacity building, and other kinds of support, can potentially lead to outcomes that are an integral part of the intensification process. Some of the focus areas of SIAGI, such as sustainable livelihoods, empowerment and social inclusion, entitlement and access, self-efficacy, reflections and fairness, and resilience to risks, are very much pertinent to this framework. Nevertheless, the linkages of initiatives and interventions with markets, policies, and institutions would also influence the nature and extent of outcomes.

2.1 Data and Methods

Given the framework discussed above, this paper addresses the research objectives using both secondary and primary data. The secondary data sourced from the Census of India and the Centre for the Development of Human Initiatives (CDHI) are used to provide the backdrop, whereas necessary primary data and information are gathered from the study villages of Dhalaguri (DG) and Uttar Chakoakheti (UC) and the nearby markets. Instead of carrying out interviews using a structured questionnaire, the primary data are collected mainly through several visits to the study villages and nearby markets, interactions with the farmer members, and engagement with different stakeholders, including input sellers, intermediaries, extension officials, etc. from 2016 to 2019. In addition, we also carried out rounds of focus group discussions (FGDs). Both male and female members participated in the FGDs. Initially, separate FGDs were conducted for male and female farmers. Subsequently, FGDs were conducted with the participation of both male and female farmers together. In general, FGDs consisted of 8 to 12 members. This helped in capturing the gender-related perspectives of intensification. Issues specific to different types of capitals were discussed, and participants' responses were noted for further analysis.

Similarly, a number of visits to the markets were made, and interactions with the market players were carried out. Such repeated engagement helped iterate data and information and get a thorough understanding of the process of changes at the community level and the market dynamics. Thus, the primary data and information used in this paper are expected to be consistent and robust. Furthermore, the paper places emphasis on the use of qualitative methods. Simple descriptive statistics are used, and qualitative analysis of information is carried out to explore how the engagements and interventions could help in the development of the capacities and capabilities of the land-constrained farmers of the study villages and hence their inclusion in the intensification process.

Instead of a top-down approach, which limits a deeper understanding of the community dynamics and hence results in poor performance of the developmental interventions (Mishra, Behera, and Nayak 2010), the approach of repeated community engagement

was adopted in the present case. It is expected that this approach will place the utmost importance on the priorities and needs of the farming community and their inherent knowledge. When the strategies for interventions are designed on the basis of insights from such engagements, they are likely to be more participatory, inclusive, and effective. Here, the views of the community are respected, and an enabling environment of co-learning is created.

In the present context, engagement with the community and other stakeholders (government officials, academia, market actors, and consumers) helped capture diverse and sometimes even competing perspectives/objectives in the development process. This exercise was performed a repeated number of times to fine-tune the insights and experiences. In addition, regular communications with different government agencies to access various schemes and subsidies were also facilitated. Furthermore, efforts were also made to disseminate information on existing government programs and subsidies to the community and to link them with the relevant government departments. As a result, farmers from the study villages were able to reap the benefits of different government initiatives.

Additionally, the capacity building (training and exposure visits) of the community members was carried out with the aim of advancing new knowledge and skills concerning modern farming practices and technologies to cope with changing market dynamics and emerging off-farm livelihood opportunities.[4] These capacity-building initiatives helped in increasing cropping intensity, crop diversification, and the application of modern farming techniques (e.g., zero tillage farming, protected cultivation, etc.). Farmers have also started venturing into supplementary livelihood avenues, such as animal husbandry. Need-based training and capacity building of the farmers, the provision of subsidized inputs under government schemes, and the development of green pastures following intensification seem to have facilitated such changes.

Finally, the observations and findings were repeatedly shared with the community, and their feedback was used to fine-tune the frameworks and approaches. This helped the community to gain new insights into decision-making, marketing, value-chain development, account-keeping, and other issues regarding agricultural development. On the other hand, the researchers had the opportunity to revise and fine-tune their research findings based on the experiences on changes in the study villages.

3. FARMING IN THE STUDY VILLAGES

Some of the basic socioeconomic and demographic aspects of the study villages are discussed in this section. Ninety-eight percent of households in UC are from the Schedule Caste (SC) and Schedule Tribe (ST) category, whereas around 66% of those living in DG belong to these social groups (Table 1). However, while DG is mostly populated with the Scheduled Caste (SC) people, UC has a high concentration of the Scheduled Tribes (STs). Further, the literacy rate in these two villages is also low, though DG has higher literacy rates, particularly in the female population, as compared to UC.

[4] Farmers from both the study villages were given training and taken to exposure visits by the NGO partner of SIAGI (i.e., CDHI) in collaboration with the Indian Institute of Technology Kharagpur, Uttar Banga Krishi Viswavidyalay (UBKV) and different agencies of the government. The UBKV is an agricultural university situated in Coochbehar, West Bengal. This university is a partner in the DSI4MTF project for providing technical supports, including training and workshops, on different agricultural issues.

Table 1: Demographic Features of the Study Villages

Aspect		Dhalaguri	Uttar Chakoakheti
Population composition by gender	Male	1,208 (53.0)	736 (52.6)
	Female	1,073 (47.0)	663 (47.4)
	Total	2,281 (100.0)	1,399 (100.0)
Caste composition of household	General	755 (33.1)	24 (1.7)
	SC	1,476 (64.7)	525 (37.5)
	ST	50 (2.2)	850 (60.8)
	Total	2,281 (100.0)	1,399 (100.0)
Educational qualification of community	Total Literate	1,771 (77.6)	867 (62.0)
	Literate Male	974 (42.7)	505 (36.1)
	Literate Female	797 (34.9)	362 (25.9)
	Total Illiterate	510 (22.4)	532 (38.0)
	Illiterate Male	234 (10.3)	231 (16.5)
	Illiterate Female	276 (12.1)	301 (21.5)

Source: Census of India 2011.

The households in these two villages mostly source livelihoods from agriculture. However, although agriculture is the primary activity in both villages, the majority of people are marginal farmers. Further, they often face challenges in agriculture due to small holdings, low yields, high costs, and low prices, along with crop damage by wild animals (The SIAGI Team 2018). In addition, the irrigation facilities are not well developed in either of the two villages. As a result, cropping intensity in these villages is less than the district average (Reddy et al. 2020). Many households prefer to work as nonfarm laborers for their livelihoods. Thus, both the study villages have scope for promoting agricultural intensification that would be socially inclusive.

Table 2: Classification of Farmers by Landholding Size in the Study Villages

Type of Farmers	Average Landholding (in acres)	Dhalaguri (% of population)	Uttar Chakoakheti (% of population)
Big	More than 5	7	6
Small	3 to 4	21	8
Marginal[5]	Less than 2	52	47

[a] Marginal farmers also include agricultural laborers and tenant farmers with less than 2 acres of land.

Source: Baseline Survey (2015) conducted by CDHI, Jalpaiguri.

As reported in Table 2, the average landholding size for the majority in both the villages is less than two acres (0.8 ha). There are also some landless farmers who grow crops on leased-in land and are engaged as agricultural laborers on others' farms. Such a low scale of farming reduces the farmers' risk-bearing ability and discourages them from farming, which leads to low cropping intensity, occupational shifts, and geographical migration (Tallapragada et al. 2018). Hence, promoting inclusive agricultural intensification in the area is a necessary but difficult task, with the challenge of making intensification inclusive, remunerative, and sustainable (Mishra et al. 2017).

[5] Marginal farmers also include agricultural laborers and tenant farmers with less than 2 acres of land.

It can also be seen that institutional supports to enhance the scale of farming through collective efforts can result in greater intensification. However, negotiation with other interest groups and stronger linkages with markets are critical for the evolution and sustainability of such institutions. Further, these institutions should also ensure fairness in the functioning of collectives and equity in the distribution of benefits in order to nurture the trust and confidence of the members. While the existing institutions in the study villages indicate the potential benefits of collective farming (Bastakoti 2017; Reddy et al. 2020), an emphasis on building the trust and confidence of the members through ethical community engagement and the development of the necessary social and human capitals are necessary to enhance and sustain the success. This paper reflects on how engagements and interventions[6] could facilitate the process of capital formation and capacity building, particularly in respect of inclusive agricultural intensification in the area.

4. INTERVENTIONS AND DEVELOPMENT OF CAPITALS

This section attempts to assess the emerging pathways and outcomes, based on the identification of the gaps between the expected or possible outcomes and the actual changes observed so far due to the interventions. An important aspect in this regard is, therefore, to understand the impact of these interventions on the intensification by the smallholder farmers. Generally, the impact of interventions is examined in terms of incidence, process, and the extent of changes in related indicators or variables. Given that many of the interventions were initiated from 2016 to 2019, this paper could capture only the initial signs of the process of changes and their impacts. Nevertheless, a deeper understanding of the underlying issues and dynamics in a long-run perspective, particularly during the post-pandemic period, leaves an interesting area for further research.

Initially, interventions under the SIAGI project started in 2016, with 27 out of a total of 551 households from Dhalaguri village and 25 out of a total of 294 households from the village of Uttar Chakoakheti. The activities carried out in the project include the hand-holding of the farmers' collectives through ethical community engagement (ECE), focus group discussions, stakeholder consultations, participatory planning, review workshops, various trainings, and exposure visits, capturing reflections of the community and other stakeholders, linkages with government programs, dissemination of changes to the government agencies, etc. A list of training and exposure visits conducted under this project is given in Appendix 2.

Two important outcomes of the continuous engagement process and interventions in the two study villages are the formation and steady functioning of a number of collectives, with the participation of both male and female members as well as landless farmers. There are three collectives in each sample village (Table 3) with each of them having seven to eight members. Importantly, these collectives have landless farmers as members. Moreover, two collectives are headed by female members. The composition of the collectives thus indicates the sign of inclusiveness and women's empowerment in the process of agricultural intensification in the study villages (Bagchi, Mishra, and Behera 2021).

[6] SIAGI made nontangible interventions, such as ethical community engagement and linkages with multiple stakeholders, whereas the sister project DSI4MTF made physical interventions in terms of solar pumps, protected farming structure, etc.

Table 3: Collectives and their Member Details in the Study Villages

Collectives	Name of Village	Total Members	Male	Female	Gender of Head of Collective	Landless
DG_1 DG-I	DG	8	6	2	M	2M, 2F
DG-II	DG	8	5	3	F	3F
DG-III	DG	7	4	3	M	3F
UC-I	UC	7	7	0	M	2M
UC-II	UC	7	5	2	M	1M
UC-III	UC	07	0	07	F	3F

M = male; F = female; DG = Dhalaguri; UC = Uttar Chakoakheti.

Source: Bagchi, Mishra, and Behera (2021).

Table 4: Crop Diversification across Collectives in the Rabi Season

Collectives	**Crops** (area in acre)	Crop Diversification Index (Simpson Index)
DG-I	Boro paddy/wheat (1.33), Potato (5), Chili (0.08), Seasonal vegetables (2), Off-season vegetables (0.03)	0.56
DG-II	Boro paddy/wheat (2), Pulses (1), Oilseeds (1), Maize (1), Chili (0.08), Seasonal vegetables (5), Off-season vegetables (0.17)	0.68
DG-III	Potato (3.67)	0.00
UC-I	Pulses (0.67), Oilseeds (3), Potato (0.17), Maize (1.33), Chili (0.05), Off-season vegetables (0.08)	0.59
UC-II	Boro paddy/wheat (3), Oilseeds (2.67), Potato (0.07), Maize (1)	0.62
UC-III	Boro paddy/wheat (1.33), Pulses (1.67), Oilseeds (2.33), Potato (1.67), Maize (1), Seasonal vegetables (1), Off-season vegetables (0.02)	0.82

Source: CDHI and Filed Visits.

As expected, because the collectives were supposed to create various opportunities and benefits (Sugden et al. 2021, there has been greater crop diversification in the study villages (Table 4). It can be seen that collectives in DG (except DG III) allocated most of the land for paddy, potato, and off-season crops, whereas collectives in UC allocated most of the land for oilseeds, maize, and paddy. In both the villages, the collectives headed by females (DG-II and UC-III) allotted land for the cultivation of Boro paddy, oilseeds, pulses, and potato, resulting in relatively greater crop diversification. This indicates that the active participation of women in the intensification process, particularly when they head the collectives, can facilitate crop diversification. However, to date, collective DG-III has not diversified its crop basket, which requires further scrutiny in order to understand the reasons for this.

The interventions conducted for the creation of different assets, their possible outcomes, and the observed changes taking place in the study villages are outlined in Table 5. Interventions in the study villages can broadly be categorized under the development of the five capitals as envisaged in the framework (Figure 2). Interventions made in the form of helping farmers to have land rights (caste certificates) allowed them to have easier access to credit from formal institutions.[7] This subsequently led to the development of financial capital in the form of higher returns on

[7] Prior to this, these farmers had very little access to institutional credit due to the lack of these documents.

investment in farming and an increase in farm size. Further, the development of the right attitude and tendency towards group financing among the collective members through the process of engagement has also played a crucial role in this regard.

Table 5: Changes Observed During and Post Interventions

Areas of Intervention	Intervention	Possible Outcomes	Observed Changes
Financial Capitals	Easy access to formal credit market because of having official documents related to property rights, caste, etc.	1. Enhancement in farm investment 2. Increase in farm size through lease-in	1. Development of group financing attitude 2. Increase in scale of farming
Human Capitals	1. Bio-economic modeling for informed crop choice from different perspectives 2. Training on off-season (early season) protected cultivation and zero-tillage farming 3. Engagement with different actors of market value chains 4. Training on health care and nutrition intake 5. Engagement in better managerial skills of collective members	1. Better agricultural practices considering the input and output market dynamics 2. Low-cost farming 3. Development of inclusive value chains 4. Women's empowerment 5. Improved decision-making ability of women 6. Use of resources for NSA	1. Practice of maintaining the accounts 2. Improvement in knowledge and skills in modern farming techniques 3. Greater awareness of nutrition and diet diversity 4. Knowledge and awareness of the importance and processes of value addition 5. Women's empowerment and leadership
Physical Capitals	1. Installation of solar pump for irrigation 2. Excavation of dug well 3. Construction of a protective farming structure 4. Better access to HYV seeds and fertilizers	1. Increase in the cropping intensity and crop diversification 2. Improvement in off-season cultivation 3. Improvement in productivity	1. Solar pump 2. Dug well 3. Submersible pump 4. Low-cost polyhouse structure These assets led to better irrigation facilities, higher cropping intensity, and crop diversification
Natural Capitals	1. Better access to irrigation for both Rabi and Kharif season 2. Rational use of water 3. Improvement in soil quality	1. Improvement of soil fertility 2. Natural resource conservation 3. Sustained increase in yield	1. Improvement in the soil quality 2. Conservation of water with better farming practices 3. Sign of increase in production and yield
Social Capitals	1. Formation of water user groups 2. Formation of farmers' collective 3. Participation of both men and women 4. Promotion of social cohesion and collective actions	Formation of FPOs through connecting the common interest groups	1. Formation of sixteen (16) new water user groups 2. Better trust-building among the group members 3. Greater social cohesion 4. Self-efficacy and empowerment 5. Collective actions 6. Development of a risk-sharing attitude

Note: NSA – Nutrition-Sensitive Agriculture; HYV – High Yielding Variety; FPO – Farmer Producer Organization.
Source: Field visits and various reports of SIAGI.[8]

[8] https://siagi.org/project-resources/.

Similarly, different training programs and engagement activities have enriched the human capital in the community. These include training on zero-tillage farming, polyhouse cultivation, livestock rearing, the use of high-yielding varieties, decision-making on crop choice, etc., and engagement in the awareness of nutrition-sensitive agriculture (Baral et al. 2021) and value-chain development (Bagchi, Mishra, and Behera 2021). Signs of many of the expected outcomes, such as improvement in accounts-keeping practices, knowledge and skills in modern farming techniques and their applicability, awareness of nutrition (Baral et al. 2021) and health care, empowerment of women, and leadership evolution, could be seen in the process. Nevertheless, reaping the benefits of nutrition-sensitive agriculture requires enhanced human capital. Likewise, the installation of solar-based submersible pumps and the creation of a dug well (Paria et al. 2021), polyhouse structures and improvement in soil quality led to the development of physical and natural capitals, but increasing farm productivity further and maintaining the same remains a critical challenge, particularly in the absence of the necessary human and social capitals.

In order to have an idea of the extent of the observed changes, the grading of the changes are shown in the following table (Table 6). Responses on a five-point scale (viz., no improvement, moderate improvement, good improvement, very good improvement, and excellent improvement) were collected from 22 collective member farmers from the study villages. The weighted averages of the responses were subsequently graded as good and very good, with the scores being 3.0–3.5 and 3.5–4.0, respectively. Notably, the weighted averages were approximated before assigning a grade. Table 6 shows that the observed changes range from good to very good.

Table 6: Extent of the Observed Changes among the Collective Members

Serial No.	Parameter of Change	Weighted_average_response_1–5	Grade*
1	Scale of Farming	3.82	Very Good
2	Accounts-Keeping Practice	3.41	Good
3	Group Financing Attitude	3.27	Good
4	Skill and Knowledge of Modern Farming Practice	3.68	Very Good
5	Awareness of Nutrition and Diet Diversity	3.68	Very Good
6	Women's Empowerment and Leadership	3.55	Good
7	Water and Irrigation Practices and Management	3.77	Very Good
8	Soil Quality	3.59	Very Good
9	Production and Yield	3.64	Very Good
10	Cropping Intensity	3.50	Good
11	Cropping Diversity	3.45	Good
12	Upscaling in New Group Formation	3.55	Good
13	Trust Building	3.73	Very Good
14	Social Cohesion among Farmers	3.91	Very Good
15	Self-efficacy of Group Members	3.77	Very Good
16	Risk-Sharing Attitude	3.59	Very Good
17	Attitude towards Collective Action	3.36	Good

*Grade: 1 = No improvement, 2 = Moderate, 3 = Good, 4 = Very Good, 5 = Excellent.

Source: Primary data collected by CDHI in May 2022.

Table 7: Broad Changes and Emerging Challenges Faced by the Farmers in the Collectives

Broad Changes Observed	Specific Changes Observed	Challenges
Farming Practices	Collective farming	• Difficulty in arranging land to meet the critical scale of farming • Conflicts of interest between group farming and individual farming • Problem of labor sharing between collective farming and wage labor during seedling and harvest season
	Farming of new crops (including high-value crops) in Rabi season and multi-cropping	• Lack of knowledge of modern farming • Inadequate irrigation water during summer • Unfavorable experience in selling high-value nutritious crops (e.g., broccoli) in nearby rural markets
Technology	Zero-tillage farming	• Crop failure due to inappropriate use of machines
	Protected farming	• Damages to the protective structure due to climatic calamity • Lack of initiative in self-financing for its repairing by the group members
	Use of HYV certified seeds	• Uncertain and irregular supply of quality seeds • Dependency on input sellers' advice for crop choice and other agriculture inputs
Behavioral	Regular observation of group meeting	• Lack of time of group members as they used to work outside the group also
	Keeping records of yield and returns	• Lack of awareness about the benefits of record-keeping
Socioeconomic Conditions	Reduced seasonal migration	• Lack of adequate and remunerative farming and other work at the local level
	Women's empowerment	• Dependence of landless women members on wage labor
	Improved land security	• Absence of proper land right document
Access to Information	Improved network with different stakeholders such as input sellers, financial institutions, government extension services, etc.	• Lack of regular interactions with relevant stakeholders, such as government departments and experts from academia • Lack of awareness of ICT
	Improved awareness of government's agriculture-related schemes	• Lack of linkages with government offices on agriculture-related works
Market	Improved linkages with market agents and traders	• Crop choice not based on market demand • Distance, the problem of transportation, and the lack of a proper environment for women to bargain or sell in the nearby markets • Lack of market information
Agriculture-based livelihood	Initiation of multiple cropping and leasing in land	• Sustainability of intensification • Increasing gross cropped area due to lack of adequate irrigation facilities • Less availability of land for leasing-in • Low returns but high risks • Crop damage due to animal attack

HYV = High Yielding Variety.

Source: Field visits.

Thus, while the formation of different capitals has led to changes in farming practices, technology, behavioral and various socioeconomic spheres of the study villages, there are also challenges that have emerged in the process (Table 7). For example, the nonavailability of adequate labor is a limiting factor, particularly during the harvest and plantation season. In addition, the initiative of the collectives toward farming broccoli caused a setback for the farmers as they faced huge losses due to marketing failure. This occurred because the nearby rural markets are not familiar with these types of high-value nutritious crops. Broadly, addressing these challenges and maintaining the momentum of collective farming requires a focus on developing the required capacity and capabilities. The repeated engagements of NGOs and researchers with the community in recent times have helped in building their awareness of different issues and instilling them with the confidence to try new ways of farming. It also helped to create proper linkages between the community and different stakeholders, such as government officials, input suppliers, and academia. Regular training on modern farming practices and technology and providing them with the necessary field support motivated the community to overcome the hurdles that came their way.

One of the major focuses of SIAGI was to improve the social capital of the community and to do so the approach of community engagement was adopted as the main tool of intervention. In this sphere of intervention, the formation of collectives and user groups, collective farming and management practice, and attempts to resolve group conflicts and problems all show signs of expected changes. Some new collectives and user groups have emerged after several interventions, and there is considerable improvement in the trust, confidence, and cohesion among the members. However, there is scope for moving up the ladder towards much larger collective actions, such as the formation of a farmer-producer company (FPC) at the local level. Importantly, the social capitals, such as team spirit, trust, and collective managerial skills created through repeated engagement with the community, helped the members stay upbeat during times of crisis during the COVID-19 pandemic and continue their agricultural activities with full vigor.

While the nurturing and management of collectives were the main intervention points at the initial stages of SIAGI, some departures from the expected pathways at later stages cast doubt on the long-term sustainability of the collectives. Despite various efforts, some members left collectives, though there were others who were interested in forming new collectives or joining the existing ones. Thus, while the interventions discussed above are necessary in the given socioeconomic milieu, they do not appear to be sufficient to make farming attractive (viable) and to sustain the initiatives. This is irrespective of the engagement process. For example, farm viability is dependent on the economic, institutional, and policy environment and various other support services, along with communities' willingness to engage with the process (ECE).

Following Scoones (2009), it can be said that parallel interventions at the local level might have helped in mobilizing the communities in the study villages. However, capturing those aspects was beyond the scope of this study. Nevertheless, some of the gaps in expected and actual outcomes can be attributed to the underlying power relations along with other unobserved factors. For example, it was not clear if the farmers of the study villages have been successful in developing effective linkages with other organizations/agencies, particularly after the COVID-19 pandemic. Another such example was the failure of farmers in UC to get a pre-promised loan from a financial institution for potato cultivation in the Rabi season of 2020, despite repaying all their previous loans to the same institution. These experiences leave some interesting areas for further research.

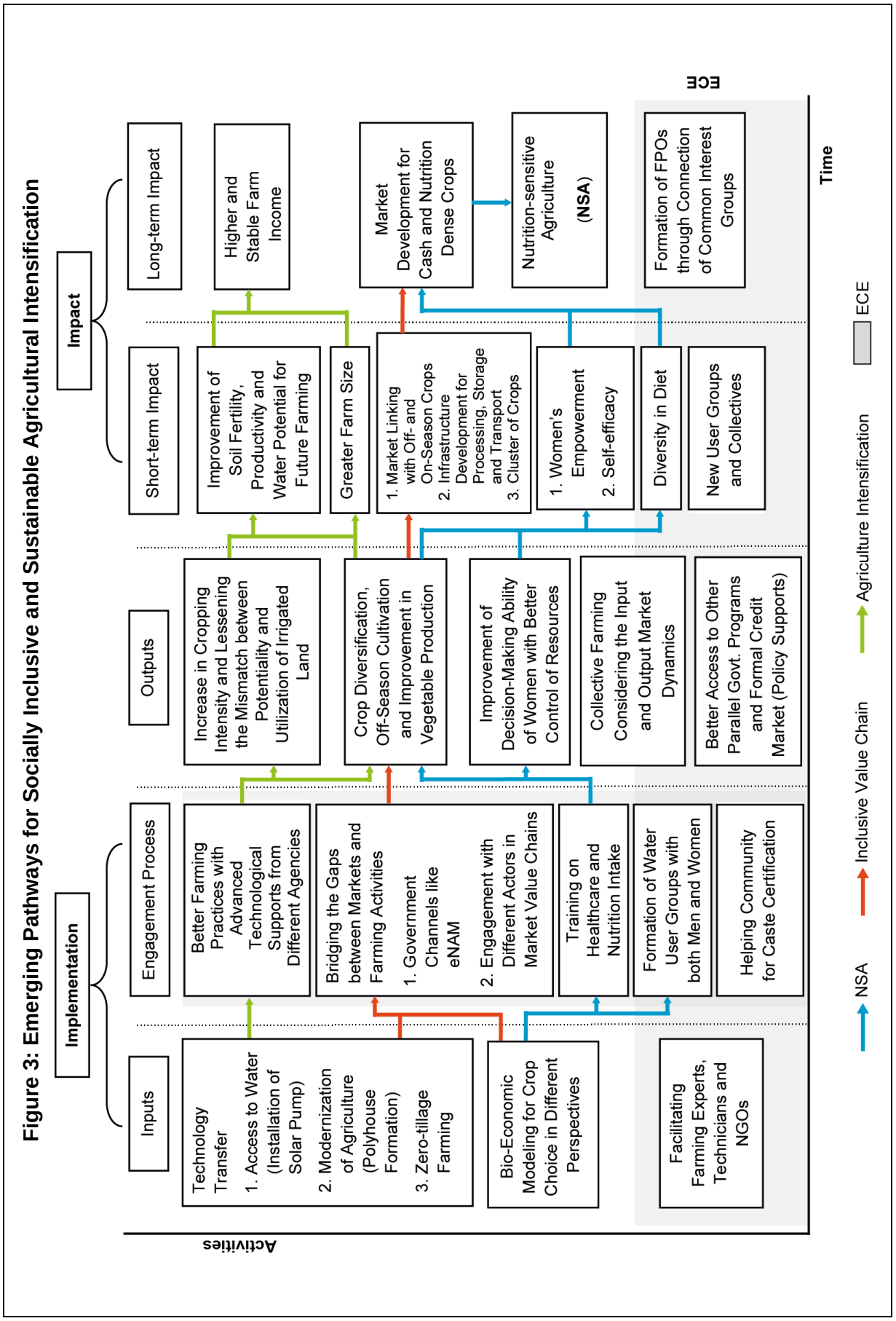
5. EMERGING PATHWAYS

Based on the scope and opportunities discussed above, the following framework of emerging pathways is proposed (Figure 3). Given the current agro-climatic and geophysical state, socioeconomic and demographic background, landholding size and scale of farming, and the dynamics in the input and output markets, certain strategies are needed in respect of crop choice, method of farming, and market linkages. These strategies may be of horizontal integration, such as the formation of collectives, and vertical integration, such as value chain development, crop diversification, input intensification, and farm mechanization. Other important strategies may be improving information flow, developing new markets, and improving existing ones. These strategies are to be implemented through appropriate policies, institutional arrangements, and repeated community engagement. One may expect that, in the process, collective farming, and value chain development, would lead to a higher and more stable income, greater access to quality foods, women's empowerment, improved risk management, and a better quality of life through the intensification of agriculture, with a focus on inclusion and sustainability.

Nevertheless, addressing the constraints relating to land and other inputs and the selling of produce is the real challenge for small and marginal farmers. While sharing these critical resources is the key to the promotion of inclusive and sustainable intensification in agriculture, capacity building of the farmers and the improvement of social capital would help resolve several of these constraints. Strong collective actions among these farmers may result in better access to inputs, information, and credits that are otherwise very difficult for marginal farmers to have, primarily because of the lack of capacity and bargaining power. Importantly, with limited availability of land, small and marginal farmers often encounter the trade-off between an increase in farm income and securing nutrition for their family members (Baral et al., 2021). In other words, these farmers often have to choose between cash crops and food crops, and getting a balance between the two becomes a difficult proposition. Although sharing labor and land resources through collective farming can be a pathway to resolve this trade-off, differences in objective functions across the members may lead to conflicts of interest and hence instabilities in the structure and functioning of the groups.

There is also a possibility of elite capture, even within the groups with regard to access to critical resources and the distribution of benefits. Such elite capture may arise because of access to social and/or political powers, greater access to information, and better human capitals and capabilities. Countering these possibilities requires the development of social capitals, such as collective actions, in addition to the necessary human capitals and capabilities by of other group members. It is also necessary to build trust and confidence among the members of a group, and bringing transparency and accountability into the functioning of the collectives would be crucial in this regard.

Figure 3: Emerging Pathways for Socially Inclusive and Sustainable Agricultural Intensification



6. CONCLUDING REMARKS

Thus, the interventions under SIAGI and its sister project seem to have resulted in some interesting processes of change, including awareness, self-efficacy, collective actions, resource mobilization, women's empowerment, and a sense of entitlement. However, it is necessary to segregate the impact of interventions under SIAGI from other initiatives. In addition, understanding the limitations of the interventions and subsequent changes and exploring future potential requires quantifying the outcomes and examining the causal relationships. Hence, further research using quantitative tools and techniques embedded in the broader qualitative framework used in SIAGI would provide better insights in this regard.

Nevertheless, the experiences of SIAGI have opened up some important trade-offs/conflicts that require serious attention in future studies. For example, the farmers in general in the study villages face the challenges of balancing social inclusion and sustainability. In particular, socially inclusive agricultural intensification by land-constrained farmers through input-intensive methods of production poses serious threats to the sustainability of the process. Similarly, while SIAGI focuses on the development of inclusive (social) value chains, the survival of the actors therein requires an emphasis on the business potential of such linkages. However, often business and social value chains may conflict with each other. This is so because inclusive value chains aim at maximizing social welfare, whereas the objective of their business counterparts is to maximize profit. But, what maximizes social welfare may not necessarily be profit-maximizing, leading to conflicts in the objectives of the actors.

Despite the success of the farmers' collectives in various aspects, as described in the study, the deviations from the expected pathway of collective participation and group behavior in terms of the quitting of some members midway in the process and a lack of adequate interest in expanding the collective actions is a matter of concern for the sustainability of the collectives. One reason for these deviations could be the low margins (profits) obtained from the collectives. This requires a deeper understanding of the functionality and processes adopted by the collectives. The situation is further exacerbated by the COVID-19 pandemic-induced slump in economic activities. This calls for the continuation of the supporting incentives (Scherr and Hazell 1994), such as follow-up engagements with the community and other government and private agricultural schemes.

The other critical aspect is the choice of crop baskets in the process of intensification. While crop diversification can reduce the production and market-related risks and provide stable livelihood opportunities for the farmers, often the development of clusters of a few crops results in economies of scale and enhances trading opportunities. Similarly, land-constrained farmers may find it difficult to make a rational choice between high (market) value cash crops and nutritious items. These aspects are very critical for the small and marginal farmers, as lower returns or higher risks may discourage them from farming, leading to occupational shifts and hence lower intensification.

Importantly, balancing these conflicts/trade-offs would require an emphasis on building up the necessary capabilities of the smallholder farmers and providing them with a continuous policy and institutional support for capacity creation and maintenance. Further, the COVID-19 pandemic-induced slump in economic activities has created the need for a continuation of the supporting incentives at the local level, such as follow-up engagements with the community and other government and private initiatives, along with the development of essential capitals and capabilities to enhance resilience to various unexpected shocks/crises. Hence, the existing approaches to, and the process of the development of, capital and capabilities to promote inclusive intensification by smallholder farmers require fine-tuning to address these aspects, leaving important areas for future studies.

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APPENDIX 1

Table A1: Changes in Composition of Farm Size in West Bengal vis-à-vis India
(%)

	1995–96		2000–01		2005–06		2010–11		2015–16	
Type of Farm Size	**West Bengal**	**India**	**West Bengal**	**India**	**West Bengal**	**India**	**West Bengal**	**India**	**West Bengal**	**India**
Marginal and Small	93.23 (0.66)	80.95 (0.63)	95.33 (0.67)	82.28 (0.63)	95.56 (0.66)	83.74 (0.60)	95.94 (0.65)	85.57 (0.60)	96.25 (0.64)	86.66 (0.58)
Medium	6.75 (3.08)	18.00 (3.73)	4.67 (3.03)	16.84 (3.67)	4.44 (2.92)	15.56 (3.59)	4.06 (2.89)	13.85 (3.58)	3.75 (2.88)	12.87 (3.50)
Large	0.02 (13.98)	1.05 (15.98)	0.00 (14.07)	0.88 (15.63)	0.00 (12.16)	0.71 (15.46)	0.00 (11.25)	0.58 (15.71)	0.00 (13.62)	0.47 (15.46)

Note: Figures in parentheses indicate average landholding (in hectares).

Source: Agricultural Census (Various Issues from 1995–96 to 2015–16), Government of India.

APPENDIX 2

Table A2: List of Training and Exposure Visits

1	Training on institutional building including internal governance, rules and regulation preparation, record-keeping etc.
2	Training on Ethical Community Engagement towards collective farming.
3	Training on crops planning and introduction of new crops
4	Training on bookkeeping
5	Training on gender and women's development on evolving issues
6	Training on water management and pump maintenance
7	Training on crop management (including INM and IPM)
8	Training on polyhouse cultivation
9	Training on vermin compost pits preparation
10	Meeting with market actors—dealers, retailers, middlemen etc.
11	Hand-holding training on water discharge measurement and fuel consumption
12	Exposure visits to progressive farmers' fields outside of the district as well as visit to FPO– Farmer Producer Organization
13	Exposure visit to ICAR (CPCRI – Central Plant and Crop Research Institute)
14	Demonstration on polyhouse construction
15	Training on linkage building with different line departments and access to government schemes
16	Workshop with government line departments