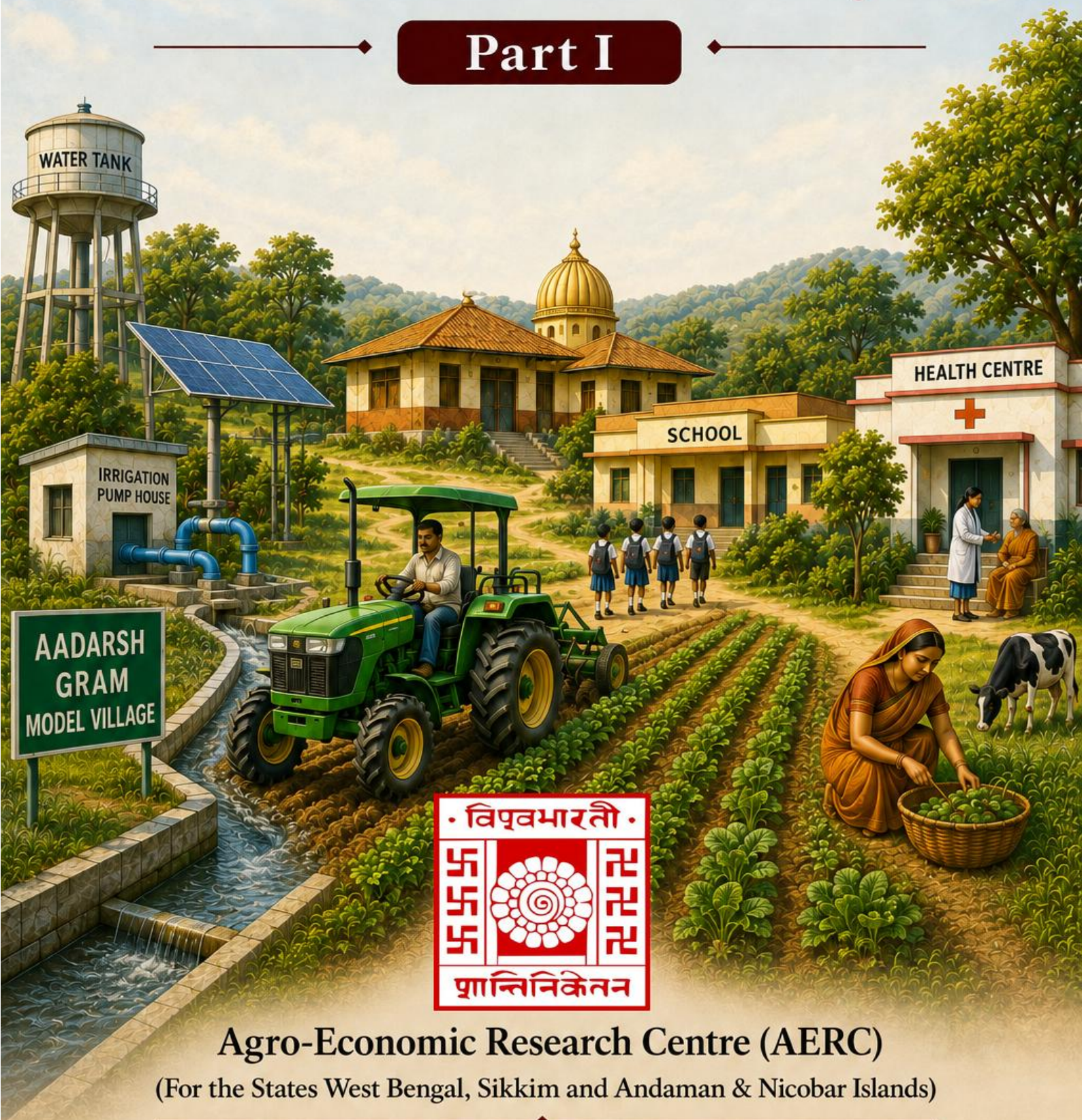


Aadarsh Gram: A Situational Analysis

Part I



Agro-Economic Research Centre (AERC)

(For the States West Bengal, Sikkim and Andaman & Nicobar Islands)

Visva-Bharati, Santiniketan

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2026

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Study Team, AERC

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Chapter - 1: Introduction

1.1 Introduction

Rabindranath Tagore's philosophy behind the Sriniketan experiment was rooted in his conviction that India's regeneration must begin in its villages. He believed that rural life had been neglected under colonial rule, leaving communities impoverished, stagnant, and dependent. For Tagore, the village was not merely an economic unit but a cultural and spiritual foundation of society. His vision was to reconstruct villages into self-reliant, creative, and dignified communities, where education, agriculture, health, and art were harmoniously integrated.

Tagore rejected charity-based approaches, insisting instead on empowerment through cooperation and participation. He wanted villagers to take responsibility for their own development, guided by modern science but enriched by traditional wisdom. Sriniketan was conceived as a laboratory of rural reconstruction, where adapted villages could demonstrate how collective effort, vocational training, and cultural revival could transform rural society. At its core, the philosophy emphasized that true progress must blend material well-being with aesthetic joy and moral responsibility, ensuring that development was not just about survival but about living a life of dignity and creativity.

This philosophy resonates strongly with contemporary initiatives such as the Sansad Adarsh Gram Yojana, which seeks to transform selected villages into model communities. Just as Sriniketan emphasized integrated education, cooperative health systems, and agricultural innovation, Adarsh Gram initiatives focus on sanitation, infrastructure, social inclusion, and sustainable livelihoods. Both approaches underscore the importance of community participation, in which villagers are empowered to take responsibility for their own development rather than relying solely on external interventions. In this way, Tagore's vision anticipated modern sustainable development frameworks, aligning closely with today's SDG goals.

The enduring relevance of Sriniketan lies in its insistence that rural progress must be people-centric, blending economic resilience with cultural enrichment. By linking Tagore's adapted villages to present-day model village programmes, we see a continuity of thought: true development is measured not only by infrastructure or income but also by the dignity,

creativity, and collective spirit of rural communities. This makes Sriniketan not just a historical experiment but a living philosophy that continues to inspire India's journey toward inclusive and sustainable village transformation.

1.2 Objectives of the Study

1. To Assess Demography, Livelihood, Resource, and Agriculture Scenario
2. To Explore the Activities of Visva-Bharati and Document the Success Story
3. To Evaluate the Potentiality and Performance as a Model Village
4. To Identify Major Problems and Proposed Solutions

1.3 Methodology

The methodology of this study is designed to capture the multi-dimensional realities of rural development, recognizing that villages are not merely economic units but complex socio-cultural ecosystems. To achieve this, the research adopted a mixed-method approach, integrating quantitative data analysis with qualitative insights from community participation. This ensured that the study was not only statistically rigorous but also socially grounded, reflecting the lived experiences of villagers.

The guiding principle was Tagore's holistic vision of rural reconstruction, which emphasized the integration of livelihood, education, health, and culture. Accordingly, the methodology sought to balance technical precision with participatory inclusiveness, making the study both academically robust and practically relevant.

1.3.1 Study Area: Location and Context

The study area comprises six adapted villages of Visva-Bharati located in two administrative blocks of Birbhum district, West Bengal:

Bolpur Sriniketan Block: Raipur, Nurpur, Kankutia & Kartickdanga

Illambazar Block: Halsidanga, Srichandrapur, and Kamarpara

This distribution allows the study to capture both the institutional influence of Sriniketan the centre of Rabindranath Tagore's rural reconstruction experiment and the diverse socio-economic realities of Illambazar, which represents a more traditional agrarian setting.

Geographically, the villages are situated within the Ajay River basin, a fertile alluvial zone that has historically supported agriculture and fisheries. Villages in the Bolpur Sriniketan block (Raipur, Nurpur, Kankutia & Kartickdanga) benefit from direct river access, which strengthens irrigation and aquaculture systems. In contrast, villages in Illambazar block (Halsidanga, Srichandrapur, and Kamarpara) face structural water challenges, with limited river access, making them more dependent on ponds and seasonal rainfall.

1.3.2 Data Sources

- The study relied on multiple sources to ensure reliability and comprehensiveness:
- Census 2011 for demographic and socio-economic baselines.
- Village-level institutional records for governance, resource management, and service delivery.
- Focus Group Discussions (FGDs) with farmers, fishers, SHG members, youth, and local leaders to capture community perspectives.
- Direct observations by researchers from AERC and REC, Visva-Bharati, to contextualize findings.
- Remote sensing data (Sentinel-2 imagery, 2017 & 2024) for land-use and resource mapping, enabling spatial analysis of change.

1.3.3 Analytical Framework

The research adopts a combined analytical framework that integrates qualitative and quantitative approaches. On the qualitative side, the villages are described in detail covering aspects such as population, social composition, livelihood systems, and resource base. To capture diverse perspectives, at least three Focus Group Discussions (FGDs) were organized, in each village, each involving around 10 to 15 participants drawn from different expert fields including agriculture, fishery, livestock, social activism, and other community stakeholders. These sessions generated individual responses, which were scored numerically on a scale of 1 to 10 across 87 sub-indicators, ensuring that local voices were systematically incorporated into the analysis.

The quantitative dimension builds upon these inputs by calculating weighted averages for five major indicators, Infrastructural, Economic, Farming, Social, and Environmental following the methodologies of Ponnusamy et al. (2015) and Bhattacharyya & Ponnusamy (2017). This structured process ensures that empirical measures are firmly grounded in community realities.

Beyond indicator analysis, the study highlights the role of Visva-Bharati University in rural development, documenting its contributions in education, agriculture, and community empowerment. This contextual layer enriches the understanding of the broader social and cultural background of the villages. Furthermore, the research identifies the major problems faced by the communities and outlines practical solutions through a structured problem–solution tree, ensuring that challenges are not only recorded but also addressed with actionable recommendations.

By combining qualitative insights with quantitative measures, the framework offers a balanced perspective. It captures both the human dimension of rural life and the measurable outcomes of institutional and infrastructural interventions, making the study comprehensive, practical, and valuable for future planning.

1.3.4 Structure of the Report

The study consists of six chapters. The current chapter (**Introduction**) has elaborated the objectives of the study along with methodology, study area, data sources, and analytical framework.

The second chapter (**Profile of the Villages**) illustrates the demography of the six adopted villages by Visva-Bharati, including population characteristics, social composition, livelihood and economic structure, resource base and infrastructure (like water resources, land resources, physical infrastructure, institutional infrastructure, and social capital), agricultural profile, and input use in agricultural activities.

The third chapter (**Role of Visva-Bharati in Aadarsh Gram**) focuses on Visva-Bharati's activities in six adopted villages and their success stories.

The fourth chapter (**Potentiality and Performances**) represents the model village potential index based on the construction of an analytical framework, including the selection of indicators, scoring system, average score performance, weightage assignment, weighted score calculation, and finally the model village potential index's (MVPI) calculations, and finally the potentiality assessment of six villages.

The fifth chapter (**Major Problems and Proposed Solutions**) bring out the key problems faced by village communities and solutions for the particular problem to overcome this, through introducing “*Problem and Solution Trees*”.

Finally, the last chapter (**Conclusion and Policy Suggestions**) accomplish major findings of the study, and policy implications in terms of village-specific development planning, strengthening irrigation and water management, agricultural modernization and diversification, reinforcing farmer institutions and opening market channels, livelihood diversification and women's empowerment through entrepreneurship, concentrate upon youth education and healthcare, environmental sustainability and land management, strengthening the Visva-Bharati and village partnership, institutionalizing MVPI-based monitoring and lastly, village-specific priorities.

Chapter - 2: Profile of the Villages

2.1 Introduction

The profile of the surveyed villages provides a comprehensive understanding of their demographic, social, economic, and resource characteristics. Each settlement reflects a unique blend of population structure, caste and religious composition, livelihood systems, and access to infrastructure. The chapter is going to highlight the demographic livelihood, resource-based infrastructure, and agricultural profile of the villages. By documenting these aspects, the chapter establishes a foundation for analysing development challenges and opportunities in subsequent sections.

2.2 Demographic Profile

In any social sciences study, showcasing the demographic profile of a village is crucial because it provides the foundational context for interpreting findings and ensuring the validity of the research. Demographic variables such as total households, total population, gender, caste, religion, literacy rate, livelihood details, and location help in understanding the macro-level composition of the village. Without this profile, it cannot be possible to assess whether the study adequately represents the target population or whether the results can be generalized. Moreover, demographic details often explain variations in attitudes, behaviours, and outcomes; for instance, differences in livelihood strategies across caste groups, or variations in health outcomes by age and gender. Presenting this profile also enhances transparency, allowing other researchers to critically evaluate sampling methods and potential biases. In essence, the demographic profile acts as the lens through which social phenomena are interpreted, linking village-level differential characteristics to broader infrastructural, economic, agricultural, social, and environmental parameters.

2.2.1 Population Characteristics

The demographic landscape of the surveyed villages reveals both strengths and disparities in household size, population distribution, gender balance, and literacy achievements. Raipur, with 650 households and a population of 2,877, demonstrates remarkable educational attainment, recording the highest literacy rate of 97%. Its sex ratio of 1,009 indicates a slightly higher number of females per 1,000 males, reflecting a balanced gender composition. Nurpur, the largest settlement with 1,080 households and 4,058 people, also maintains a near-equal sex

ratio of 1,003 and a strong literacy rate of 96%, suggesting that larger population size has not hindered educational progress.

In contrast, Kartickdanga and Kankutia, with 797 households and 3,027 people, show a slightly lower sex ratio of 976, indicating fewer females relative to males, though literacy remains high at 95%. Halsidanga, the smallest village with only 186 households and 770 people, records the lowest sex ratio of 920, pointing to a significant gender imbalance. However, its literacy rate of 96% is commendable, showing that even small communities can achieve strong educational outcomes.

Srichandrapur, with 230 households and 980 people, presents a mixed picture: while its sex ratio of 970 is moderately balanced, the literacy rate drops sharply to 80%, the lowest among all villages. This suggests challenges in educational access or attainment that set it apart from the otherwise high-performing region. Finally, Kamarpara, with 390 households and 1,527 people, stands out for having the most favourable sex ratio of 1,058, indicating a clear female advantage. Its literacy rate of 85%, though lower than Raipur and Nurpur, is still respectable and above Srichandrapur level.

Table 2.1 Population Characteristics (Estimated)

Villages	Total households	Total population	Sex ratio (per 1000 male)	Literacy rate (%)
Raipur	650	2877	1009	97.00
Nurpur	1080	4058	1003	96.00
Kartickdanga and Kankutia	797	3027	976	95.00
Halsidanga	186	770	920	96.00
Srichandrapur	230	980	970	80.00
Kamarpara	390	1527	1058	85.00

Source: FGD with Stakeholders

2.2.2 Social Composition

The caste composition varies significantly across villages, shaping social dynamics and access to resources. Table 2.2 shows that most of the households in Raipur village belong to the General Caste (64.00%), followed by the Scheduled Caste (21.00%), the Scheduled Tribe (10.00%), and the OBC (5.00%). Nurpur has a majority Scheduled Caste (49.90%) population, with General Caste at 35.21% and Scheduled Tribe at 14.89%. Kankutia & Kartickdanga show a balanced mix, with 41.27% General, 37.50% Scheduled Caste, and 21.23% Scheduled Tribe.

Halsidanga is dominated by General caste (65.90%), with 34.10% Scheduled Caste and no Scheduled Tribe presence.

Srichandrapur has a strong Scheduled Caste majority (69.33%), with 30.45% General and a negligible Scheduled Tribe presence (0.22%). Kamarpara is unique, with a significant Scheduled Tribe population (42.16%), alongside 31.92% Scheduled Caste and 25.92% General caste. This diversity reflects varied socio-economic structures across the villages.

Table 2.2 Caste Distribution

Villages	General (%)	OBC (%)	SC (%)	ST (%)
Raipur	64.00	5.00	21.00	10.00
Nurpur	35.21	0.00	49.90	14.89
Kartickdanga and Kankutia	41.27	0.00	37.50	21.23
Halsidanga	65.90	0.00	34.10	0.00
Srichandrapur	30.45	0.00	69.33	0.22
Kamarpara	25.92	0.00	31.92	42.16

Source: FGD with Stakeholders

Table 2.3 Religious Distribution

Villages	Hindu	Muslim	Christian	Others
Raipur	100.00	0.00	0.00	0.00
Nurpur	86.00	14.00	0.00	0.00
Kartickdanga and Kankutia	62.94	37.06	0.00	0.00
Halsidanga	93.53	6.47	0.00	0.00
Srichandrapur	100.00	0.00	0.00	0.00
Kamarpara	98.97	1.02	0.00	0.00

Source: FGD with Stakeholders

Religious composition also highlights pluralism. Table 2.3 indicates that Raipur is an entirely Hindu-inhabited village, whereas Nurpur is predominantly Hindu (86%) with a Muslim minority (14%). Kankutia & Kartickdanga show greater diversity, with 62.94% Hindu and 37.06% Muslim populations. Halsidanga is overwhelmingly Hindu (93.53%) with a small Muslim presence (6.47%). Srichandrapur is entirely Hindu (100%), while Kamarpara is almost entirely Hindu (98.97%) with a small Muslim minority (1.02%).

The village comprises socially and religiously diverse groups that coexist with relatively high levels of social harmony. This diversity contributes to a pluralistic social structure, reinforced by shared cultural activities and institutions.

2.3 Livelihood and Economic Structure

Raipur: Agriculture is the primary occupation and the backbone of the village economy, sustaining the majority of households. Alongside farming, agricultural and non-farm wage labour provides regular employment opportunities, ensuring livelihood security for many families. Income diversification is further supported by service sector employment, with both government and private jobs contributing to household earnings. Livestock rearing acts as an important supplementary source of livelihood, while fisheries activities, sustained by village ponds, add another dimension to rural sustenance. In addition, local businesses and petty trade strengthen the rural economy, fostering household-level entrepreneurship and enhancing community resilience.

Nurpur: In Nurpur village, the fisheries occupation is the primary livelihood, forming the backbone of the local economy and sustaining the majority of households. Alongside this, agricultural and non-farm wage labour provides regular employment opportunities, ensuring income stability for many families. The service sector also contributes to diversification, with government and private jobs supplementing household earnings. Livestock rearing acts as an important supplementary source of livelihood, while local businesses and petty trade strengthen the rural economy, fostering entrepreneurship and enhancing household resilience. Together, these diverse livelihood activities create a balanced economic structure that supports both sustainability and growth in Nurpur village.

Kankutia & Kartickdanga: In Kankutia and Kartickdanga villages, agriculture is the primary occupation, forming the backbone of the local economy and sustaining most households. Alongside farming, non-farm wage labour provides another important source of regular employment opportunities, ensuring livelihood security for many families. The fisheries occupation also plays a significant role, offering an additional source of income and food security for the villagers. Income diversification is further supported by service sector employment, with both government and private jobs contributing to household earnings. Livestock rearing acts as an important supplementary livelihood, while local businesses and petty trade strengthen the rural economy, fostering entrepreneurship and enhancing household

resilience. Together, these diverse livelihood activities create a balanced and sustainable economic structure in Kankutia and Kartickdanga.

Halsidanga: In Halsidanga village, agriculture serves as the primary occupation, forming the backbone of the local economy and supporting the majority of households. Alongside farming, non-farm wage labour provides a vital source of regular employment, ensuring livelihood stability for many families. The fisheries occupation also contributes significantly to household income, offering an additional means of sustenance. Income diversification is further enhanced by service-sector employment, with both government and private jobs playing important roles. Moreover, livestock rearing acts as a supplementary livelihood, while local businesses and petty trade strengthen the rural economy by promoting small-scale entrepreneurship and self-reliance.

Srichandrapur: In Srichandrapur village, agriculture is the main occupation, supporting most households and forming the backbone of the local economy. Alongside farming, agricultural and non-farm wage labour provides regular employment, ensuring livelihood security for many families. Fisheries activities in village ponds provide another source of income and enhance food security. The service sector, through government and private jobs, further diversifies household earnings. Supplementary livelihoods such as livestock rearing and small businesses strengthen the rural economy, fostering entrepreneurship and resilience.

Kamarpara: In Kamarpara village, agriculture is the primary occupation, forming the backbone of the local economy and sustaining most households. Farming activities dominate the livelihood structure, with most families engaged in crop cultivation year-round. Alongside agriculture, agricultural wage labour provides an important source of regular employment, ensuring livelihood security for landless and marginal farmers. The village also supports fisheries activities, with several ponds used for fish farming and household consumption, contributing to income diversification. Additionally, service-sector employment, including both government and private jobs, supplements household earnings and enhances economic stability. Local residents also participate in petty trade and small businesses, which strengthen the rural economy by promoting entrepreneurship and self-reliance. Together, these diverse livelihood activities create a balanced and resilient economic structure in Kamarpara, where farming remains central but is complemented by labour, fisheries, and service-based income sources.

Table 2.4 Livelihood Details

Villages	Major Primary Occupation	Secondary occupation
Raipur	Agriculture	Non-farm wage labour, service sector jobs, livestock rearing, fisheries, local businesses & petty trade
Nurpur	Fisheries	Agriculture, non-farm wage labour, service sector jobs, livestock rearing, local businesses & petty trade
Kartickdanga and Kankutia	Agriculture	Non-farm wage labour, fisheries, service sector jobs, livestock rearing, local businesses & petty trade
Halsidanga	Agriculture	Non-farm wage labour, fisheries, service sector jobs, livestock rearing, local businesses & petty trade
Srichandrapur	Agriculture	Non-farm wage labour, fisheries, service sector jobs, livestock rearing, local businesses & petty trade
Kamarpara	Agriculture	Non-farm wage labour, fisheries, service sector jobs, livestock rearing, local businesses & petty trade

Source: FGD with Stakeholders

2.4 Resource Base and Infrastructure

2.4.1 Water Resources

Raipur: Raipur village has a rich, well-managed water resource system that supports both agricultural and livelihood activities. The village has almost 40 ponds used for fishing and irrigation, including four constructed under the MGNREGA scheme, which enhance water conservation and employment generation. Additionally, the village enjoys direct access to the Ajay River, located approximately 1 km away, ensuring a reliable source of surface water throughout the year. This proximity to the river, combined with the extensive pond network, provides adequate water availability for irrigation and fishing. The integrated water resource framework of Raipur thus contributes significantly to agricultural productivity, fisheries development, and overall rural sustainability.

Nurpur: Nurpur village possesses a diverse and sustainable water resource system that supports its primary livelihood in fisheries and agriculture. The village has 25 ponds used particularly for fishing and aquaculture. These ponds serve as vital assets for local employment and food security. In addition, the village has access to the Ajay River, located approximately 1 km away, which provides a dependable source of surface water. The combination of pond-based water management and river proximity ensures adequate water availability throughout the year, strengthening the village's fisheries-based economy.

Kankutia & Kartickdanga: Kankutia & Kartickdanga villages possess a well-developed and sustainable water resource system that supports both agricultural and fisheries-based livelihoods. The villages have 52 ponds utilized for irrigation and fishing, including one constructed under MGNREGA and eleven reshaped through the WBADMI Project, which have significantly improved water storage and management capacity. These ponds serve as vital assets for crop cultivation, aquaculture, and livestock watering, ensuring year-round water availability. Additionally, the villages have access to the Ajay River, located approximately 2.5 km away, providing a dependable source of surface water for irrigation and domestic use. The combination of extensive pond networks and river proximity ensures adequate water availability throughout the year, strengthening agricultural productivity and supporting fisheries development. This integrated water management system highlights the villages' commitment to sustainable resource utilization and climate-resilient rural growth.

Halsidanga: Halsidanga village maintains a well-balanced and sustainable water resource system that supports its agricultural and fisheries-based livelihoods. The village has 35 ponds that serve multiple purposes, including irrigation and fish farming. In addition, the village benefits from access to the nearby Ajay River, which provides a dependable source of surface water for irrigation and household needs. The combination of pond-based water storage and river access ensures adequate water availability throughout the year, strengthening agricultural productivity and supporting fisheries development. This integrated water resource framework contributes significantly to Halsidanga's rural economy and enhances its resilience against seasonal water scarcity.

Srichandrapur: Srichandrapur village faces considerable challenges in water resource management compared to other surveyed settlements. The village has 25 ponds, of which 20 are actively used for fishing and domestic purposes, making aquaculture a significant contributor to household sustenance. However, unlike other villages, Srichandrapur lacks direct river access, which severely limits its irrigation potential. The absence of a perennial river system results in water scarcity for agriculture, restricting crop diversification and reducing farming productivity. While the ponds provide some relief by supporting fisheries and limited household needs, they are insufficient to meet the village's broader irrigation requirements. This dependency on pond-based water resources, without supplementary river access, creates a structural vulnerability in the local economy. As a result, Srichandrapur's

agricultural sector struggles with inadequate water availability, leading to lower yields and reduced resilience against seasonal fluctuations.

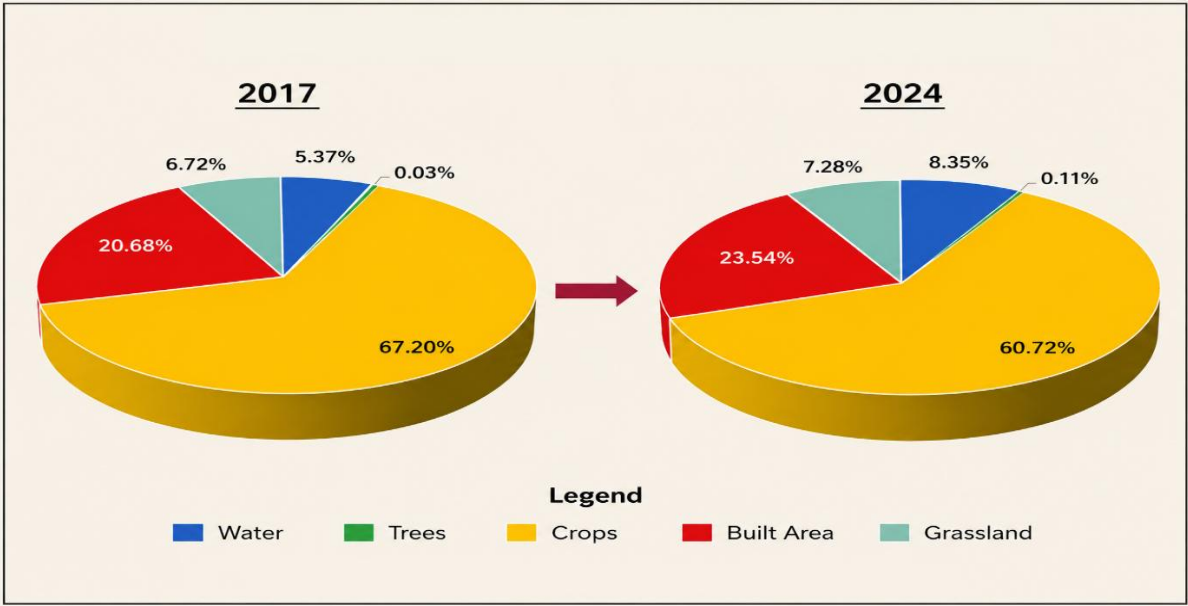
Kamarpara: Kamarpara village has a limited water resource base, which directly affects its agricultural sustainability. The settlement contains 14 ponds, primarily used for fishing and domestic purposes. These ponds provide some livelihood support through aquaculture and household water needs, but they are insufficient to meet the village's irrigation demands. Unlike other villages in the region, Kamarpara lacks access to a nearby river, so there is no perennial water availability for agriculture. This absence of river resources creates a significant irrigation problem, restricting crop diversification and reducing agricultural productivity. Farmers remain heavily dependent on seasonal rainfall and pond water, which is often inadequate during dry periods. Consequently, while fisheries and domestic use benefit from the existing ponds, the lack of irrigation infrastructure poses a major challenge to farming activities and long-term rural resilience. The water resource profile of Kamarpara highlights the urgent need for interventions such as pond rejuvenation, rainwater harvesting, and groundwater management to strengthen irrigation capacity and ensure sustainable agricultural development.

2.4.2 Land Resources

Raipur: The recent land use data (2024) for Raipur reveal a diverse spatial distribution across land types, reflecting both agricultural dominance and gradual urban expansion. Of the total area of 191.79 hectares, cropland remains the largest category, covering 116.45 ha (60.72%) and continues to form the backbone of the local economy. The built-up area occupies 45.14 ha (23.54%), indicating significant infrastructural growth and settlement expansion. Water bodies cover 16.02 ha (8.35%), showing improvement in water resource management or pond development. Grassland accounts for 13.97 ha (7.28%) and supports livestock and ecological balance, while tree cover remains minimal at 0.21 ha (0.11%), indicating limited forested areas. To understand land transitions, the land use pattern of Raipur shows a clear transformation between 2017 and 2024, reflecting both developmental expansion and environmental adjustments. In 2017, cropland dominated the area, covering about 67.20% of the total land area, making agriculture the principal land use. However, by 2024, this share had declined to 60.72%, indicating a gradual reduction in agricultural space. Meanwhile, the built-up area increased significantly from 20.68% to 23.54%, highlighting ongoing urbanization and infrastructure growth. The proportion of water bodies rose from 5.37% to 8.35%, possibly due to improved water management or expansion of ponds and reservoirs. Similarly, tree cover

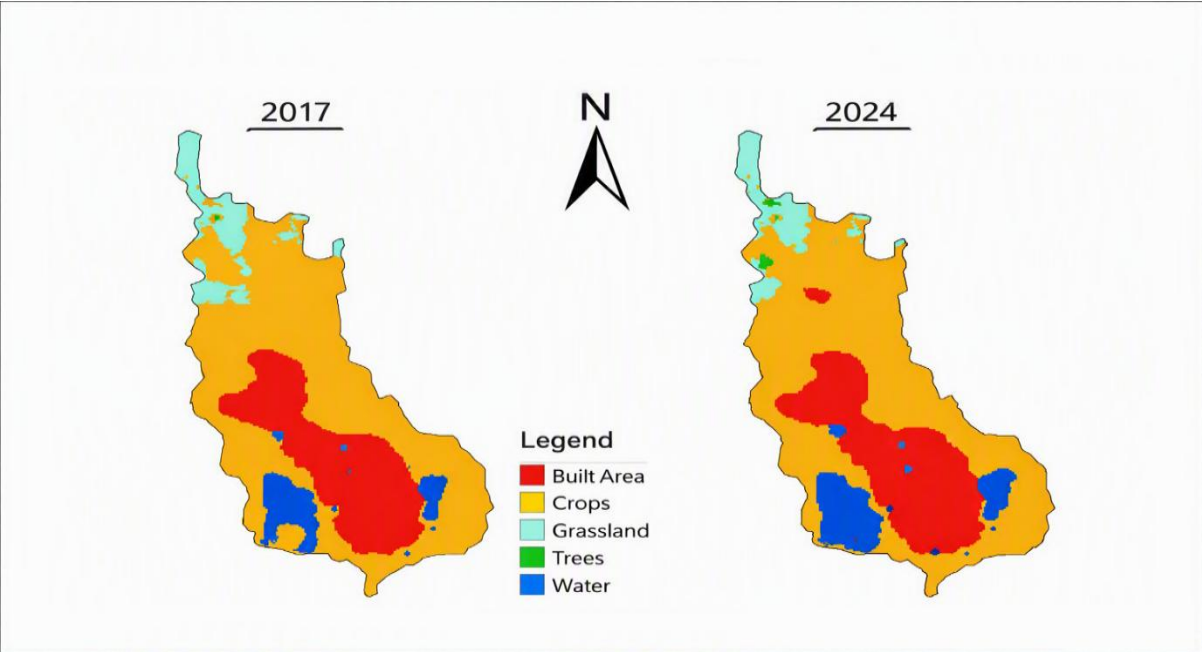
grew from 6.72% to 7.28%, suggesting minor ecological improvement or afforestation efforts. Grassland remained negligible, increasing only slightly from 0.03% to 0.11%. Overall, the maps and charts indicate that Raipur’s landscape is shifting toward greater built-up development and diversified land use, while maintaining moderate agricultural and ecological balance.

Figure 2.1 Distribution of Land and Its Change in Raipur Village



Source: Calculated from Sentinel-2 LULC Time Series

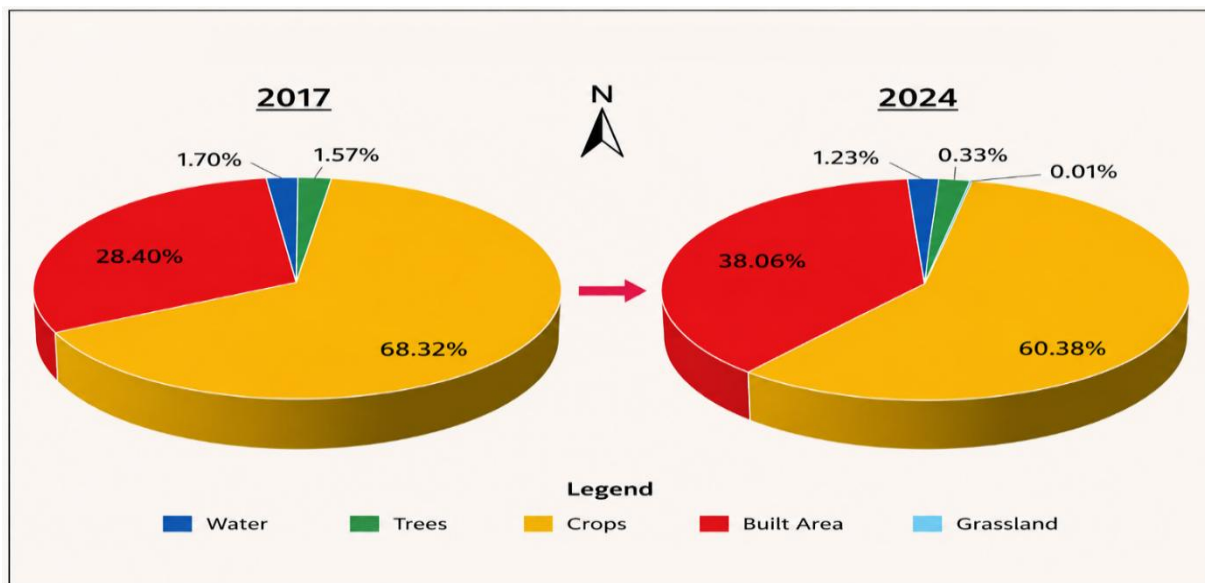
Figure 2.2 Change of Land Use in the Map of Raipur



Source: Sentinel-2 LULC Time Series

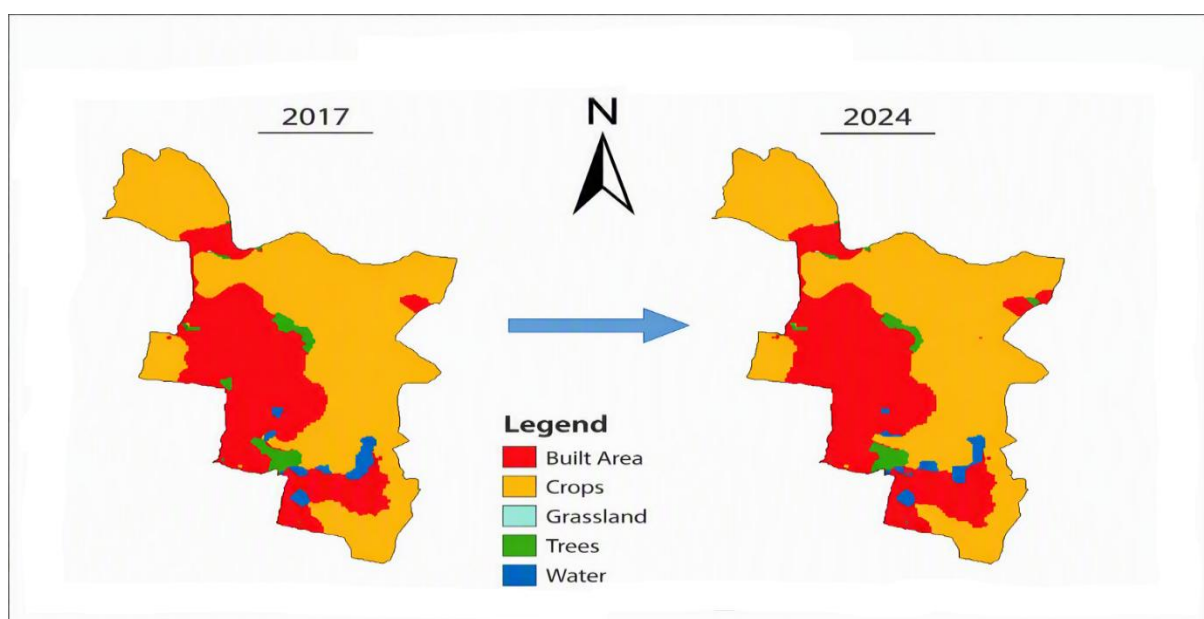
Nurpur: The recent land use data (2024) for Nurpur highlights a diversified but shifting spatial distribution. Cropland continues to dominate, covering the majority of the area and forming the backbone of the village economy. However, the built-up area has expanded considerably, reflecting settlement growth and infrastructural development. Water bodies, sustained by village ponds, provide ecological and livelihood support, while tree cover and grassland remain minimal, indicating limited forested and grazing zones.

Figure 2.3 Distribution of Land and Its Change in Nurpur Village



Source: Calculated from Sentinel-2 LULC Time Series

Figure 2.4 Change of Land Use in the Map of Raipur



Source: Sentinel-2 LULC Time Series

When compared with 2017 data, clear changes emerge. Cropland has declined, reflecting a gradual reduction in agricultural land, while built-up areas have expanded, indicating urbanization. Water bodies and tree cover have seen slight fluctuations, reflecting ecological adjustments, and grassland remains negligible.

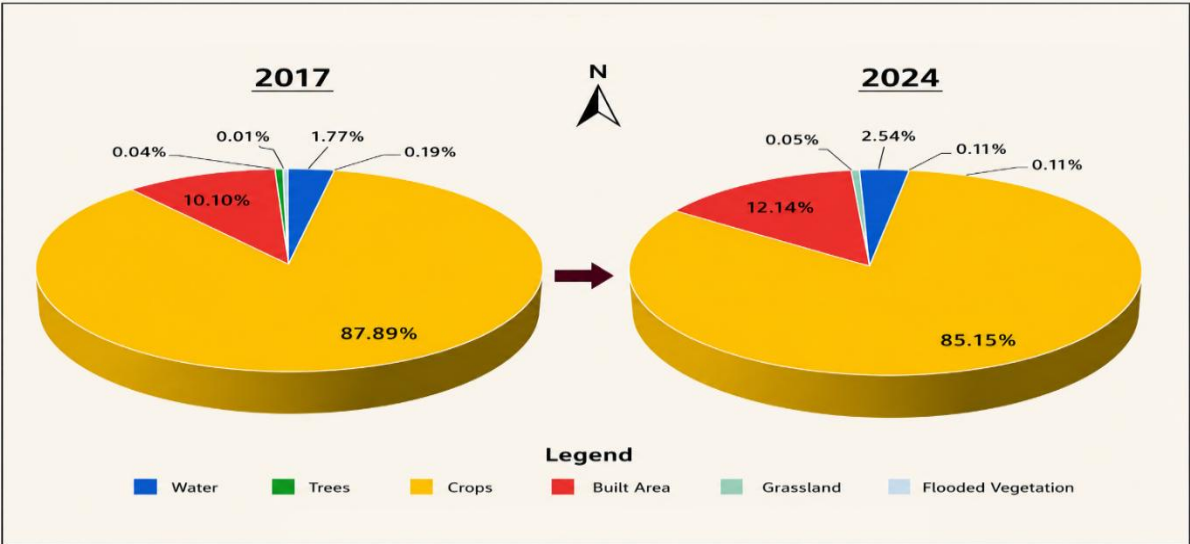
Overall, Nurpur's land-use transformation between 2017 and 2024 reveals a shift toward urban growth and land diversification, with agriculture remaining dominant yet increasingly complemented by settlement expansion and ecological elements. This mirrors the broader rural-to-urban transition observed in similar villages.

Kankutia & Kartickdanga: The recent land-use data (2024) for Kankutia & Kartickdanga Village indicate a predominantly agricultural landscape. Cropland occupies 343.37 ha (85.15%) of the total geographical area, making it the dominant land use and the primary source of livelihood for the village population. The built-up area covers 48.95 ha (12.14%), reflecting the gradual expansion of residential settlements and associated infrastructure. Water bodies cover 10.26 ha (2.54%) and play important roles in irrigation, fisheries, and the maintenance of the local ecological balance. In contrast, tree cover (0.45 ha; 0.11%) and grassland (0.22 ha; 0.05%) occupy only a very small proportion of the village area, indicating limited forested and grazing land.

Compared with the 2017 land use pattern, noticeable changes are evident. Cropland declined from 354.41 ha (87.89%) in 2017 to 343.37 ha (85.15%) in 2024, indicating a gradual conversion of agricultural land to other land uses. In contrast, the built-up area increased from 40.74 ha (10.10%) to 48.95 ha (12.14%), reflecting the expansion of settlements and infrastructure in response to socio-economic development. Water bodies increased from 7.14 ha (1.77%) to 10.26 ha (2.54%), suggesting improvements in water resource availability and management. Tree cover declined slightly from 0.75 ha (0.19%) to 0.45 ha (0.11%), while grassland increased marginally from 0.15 ha (0.04%) to 0.22 ha (0.05%). Flooded vegetation, which accounted for 0.06 ha (0.01%) in 2017, was absent in the 2024 land use classification. Overall, the land-use transformation of Kankutia & Kartickdanga Village between 2017 and 2024 reveals a gradual shift toward settlement expansion and land-use diversification. Although agriculture continues to dominate the village landscape, the decline in cropland, coupled with the increase in built-up area, reflects growing developmental pressure on agricultural land. At the same time, the expansion of water bodies indicates improved management of local water resources. These changes illustrate the ongoing rural transformation

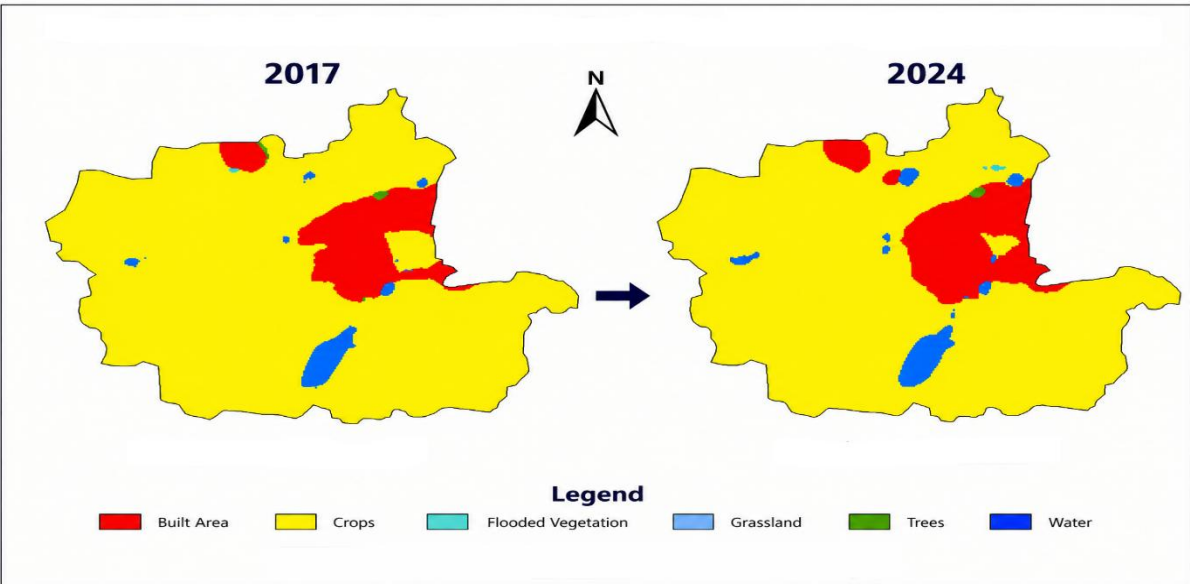
of the village, where agricultural land remains the backbone of the local economy, while increasing settlement development and shifting land-use patterns reflect broader socio-economic changes.

Figure 2.5 Distribution of Land and Its Change in Kankutia & Kartickdanga Village



Source: Calculated from Sentinel-2 LULC Time Series

Figure 2.6 Change of Land Use in the Map of Kankutia & Kartickdanga

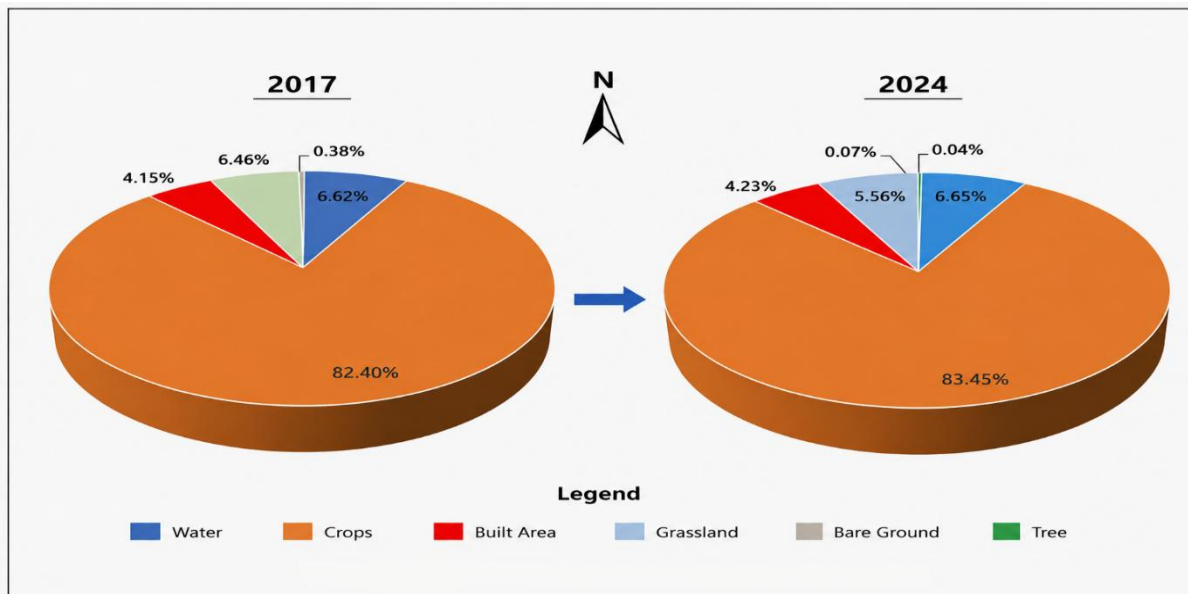


Source: Sentinel-2 LULC Time Series

Halsidanga: The recent land-use data (2024) for Halsidanga Village indicate a predominantly agricultural landscape. Cropland occupies 219.63 ha (83.45%) of the total geographical area, making it the dominant land use and the primary source of livelihood for the village population.

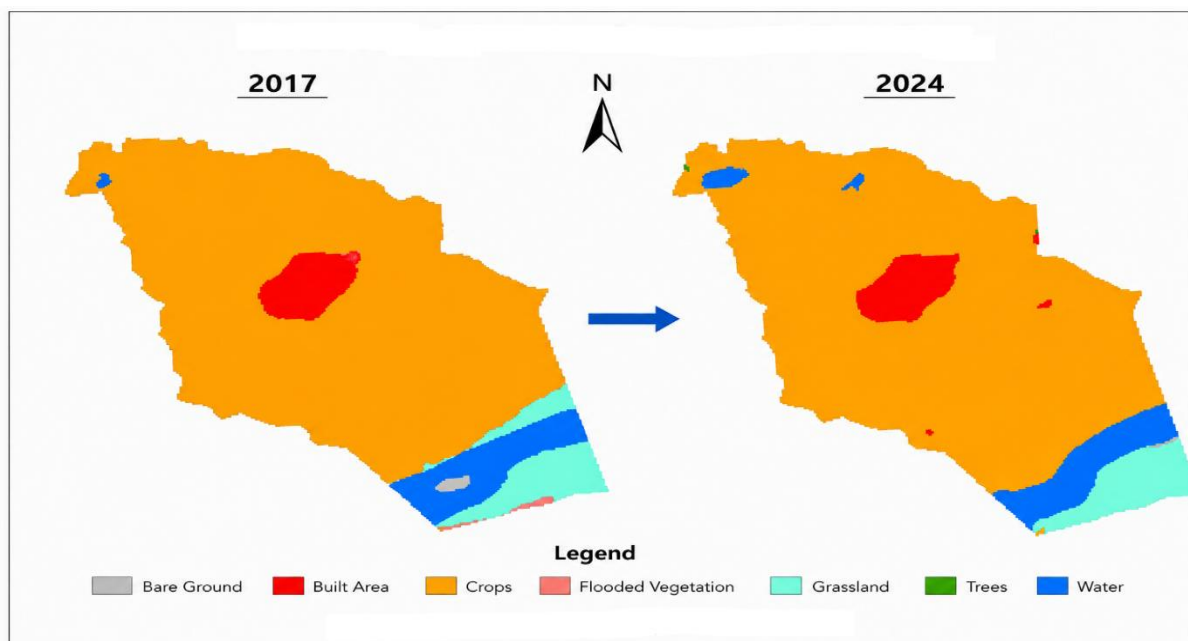
The built-up area covers 11.13 ha (4.23%), reflecting the gradual expansion of residential settlements and associated infrastructure. Water bodies cover 17.51 ha (6.65%) and play vital roles in irrigation, fisheries, and the maintenance of the local ecological balance. Grassland covers 14.64 ha (5.56%), while bare ground (0.18 ha; 0.07%) and tree cover (0.11 ha; 0.04%) occupy only small portions of the village area, indicating limited forested and open land.

Figure 2.7 Distribution of Land and Its Change in Halsidanga Village



Source: Calculated from Sentinel-2 LULC Time Series

Figure 2.8 Change of Land Use in the Map of Halsidanga



Source: Sentinel-2 LULC Time Series

Compared with the 2017 land-use pattern, noticeable changes are evident. Cropland increased slightly from 216.87 ha (82.40%) to 219.63 ha (83.45%), suggesting improved agricultural utilization and productivity. The built-up area expanded marginally from 10.92 ha (4.15%) to 11.13 ha (4.23%), reflecting steady settlement growth. Water bodies remained nearly stable, increasing from 17.42 ha (6.62%) to 17.51 ha (6.65%), indicating consistent water resource management. Grassland declined from 17 ha (6.46%) to 14.64 ha (5.56%), possibly due to conversion into cropland or settlement areas. Bare ground decreased sharply from 0.99 ha (0.38%) to 0.18 ha (0.07%), while tree cover, newly classified in 2024, accounted for 0.11 ha (0.04%).

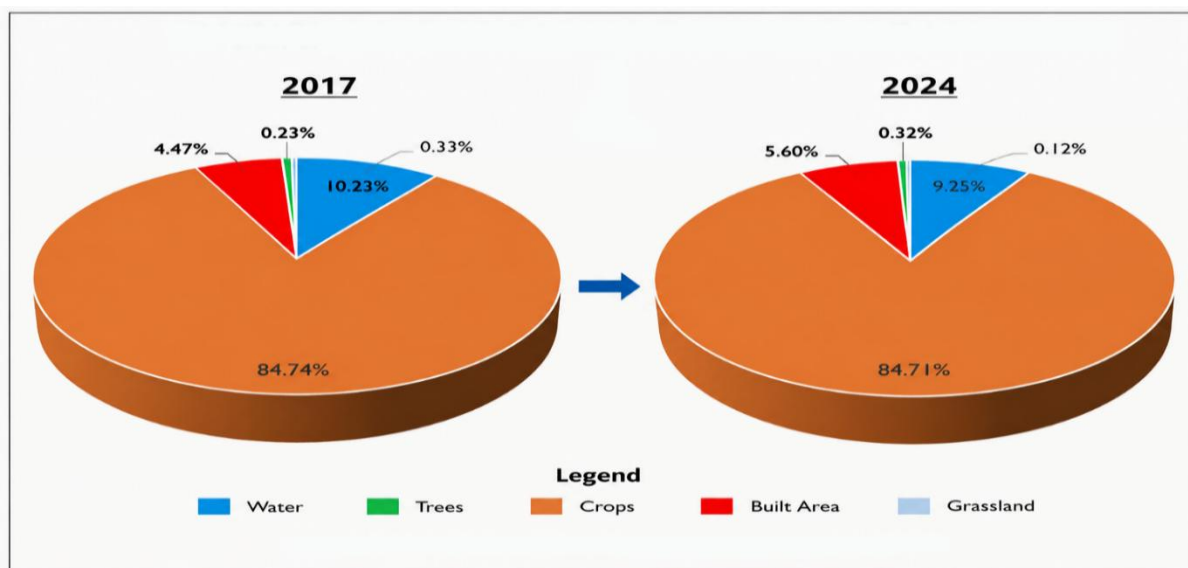
Overall, the land-use transformation of Halsidanga Village between 2017 and 2024 reveals a stable agricultural base with minor diversification. The slight increase in cropland and built-up area reflects ongoing rural development and settlement expansion, while the reduction in grassland and bare ground indicates more efficient land utilization. These changes highlight Halsidanga's gradual evolution toward a more organized and productive rural landscape, where agriculture continues to dominate but settlement growth and improved resource management signal progressive socio-economic development.

Srichandrapur: The recent land-use data (2024) for Srichandrapur Village indicate a predominantly agricultural landscape. Cropland occupies 170.83 ha (84.71%) of the total geographical area, making it the dominant land use and the primary source of livelihood for the village population. The built-up area covers 11.29 ha (5.60%), reflecting the gradual expansion of residential settlements and associated infrastructure. Water bodies occupy 18.66 ha (9.25%), playing vital roles in irrigation, fisheries, and maintaining the local ecological balance. Grassland covers 0.65 ha (0.32%), while tree cover (0.24 ha; 0.12%) occupies only a small portion of the village area, indicating limited forested land.

Compared with the 2017 land-use pattern, noticeable changes are evident. Cropland remained almost stable, declining slightly from 170.89 ha (84.74%) to 170.83 ha (84.71%), showing sustained agricultural dominance. The built-up area increased from 9.02 ha (4.47%) to 11.29 ha (5.60%), reflecting settlement growth and infrastructure development. Water bodies decreased from 20.64 ha (10.23%) to 18.66 ha (9.25%), suggesting a minor reduction in surface water coverage. Grassland expanded from 0.46 ha (0.23%) to 0.65 ha (0.32%), while tree cover declined from 0.66 ha (0.33%) to 0.24 ha (0.12%), indicating reduced vegetation density.

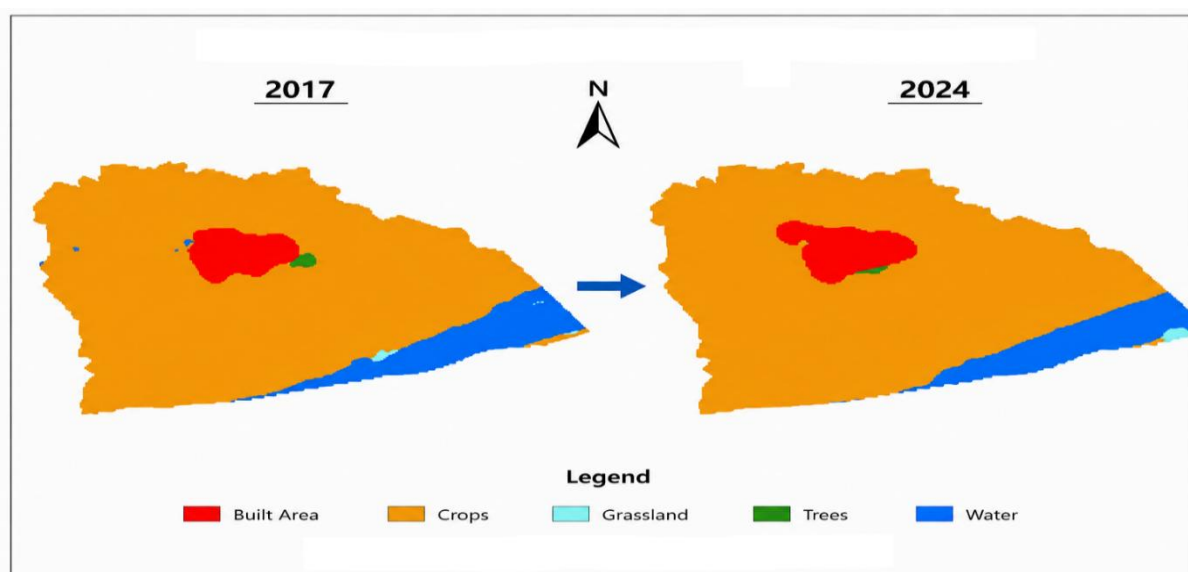
Overall, the land-use transformation of Srichandrapur Village between 2017 and 2024 reveals a stable agricultural base with gradual settlement expansion and minor ecological shifts. The slight increase in built-up area and grassland reflects ongoing rural development, while the reduction in water and tree cover points to changing environmental conditions. These trends highlight Srichandrapur's steady evolution toward a more developed rural landscape, where agriculture continues to dominate but settlement growth and land-use diversification signal progressive socio-economic change.

Figure 2.9 Distribution of Land and Its Change in Srichandrapur Village



Source: Calculated from Sentinel-2 LULC Time Series

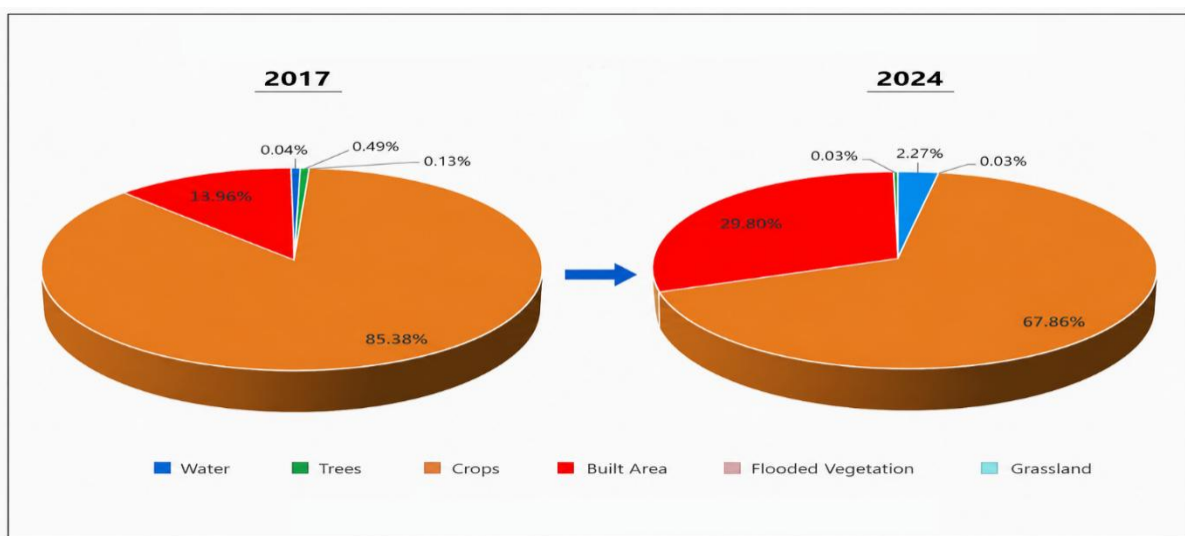
Figure 2.10 Change of Land Use in the Map of Srichandrapur



Source: Sentinel-2 LULC Time Series

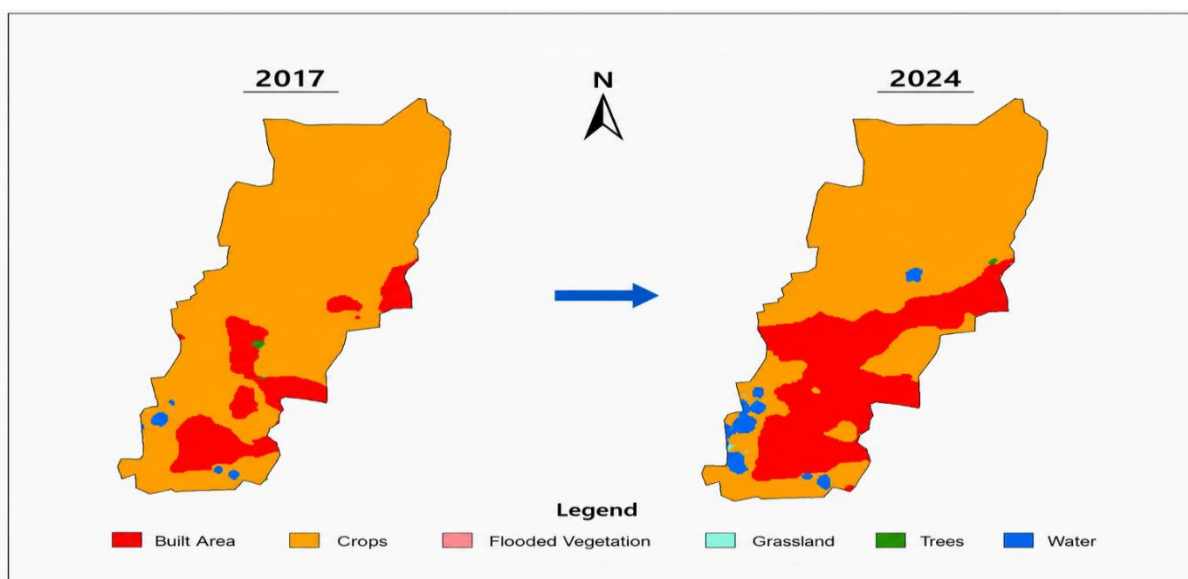
Kamarpara: The recent land-use data (2024) for Kamarpara Village reveal a significant transformation in the local landscape. Cropland occupies 138.47 ha (67.86%) of the total geographical area, remaining the dominant land use but showing a marked decline compared with 2017. The built-up area has expanded sharply to 60.81 ha (29.80%), reflecting rapid settlement growth, infrastructure development, and increasing urbanization. Water bodies cover 4.64 ha (2.27%), playing a crucial role in irrigation and ecological balance, while trees (0.06 ha; 0.03%) and grassland (0.06 ha; 0.03%) occupy minimal portions of the area, indicating limited vegetation and open land.

Figure 2.11 Distribution of Land and Its Change in Kamarpara Village



Source: Calculated from Sentinel-2 LULC Time Series

Figure 2.12 Change of Land Use in the Map of Kamarpara



Source: Sentinel-2 LULC Time Series

Compared with the 2017 land-use pattern, the changes are striking. Cropland declined from 174.21 ha (85.38%) to 138.47 ha (67.86%), showing a substantial conversion of agricultural land into built-up zones. The built-up area more than doubled, rising from 28.49 ha (13.96%) to 60.81 ha (29.80%), highlighting accelerated residential and infrastructural expansion. Water bodies increased from 0.99 ha (0.49%) to 4.64 ha (2.27%), suggesting improved water management or creation of new ponds and reservoirs. Tree cover decreased from 0.27 ha (0.13%) to 0.06 ha (0.03%), while grassland, newly classified in 2024, accounted for 0.06 ha (0.03%). Flooded vegetation, which occupied 0.08 ha (0.04%) in 2017, was absent in the 2024 classification.

Overall, the land-use transformation of Kamarpara Village between 2017 and 2024 reflects a clear shift toward urban expansion and declining agricultural dominance. The rapid increase in built-up area and reduction in cropland indicate growing developmental pressure on farmland, while the rise in water bodies points to improved resource management. These changes illustrate Raipur's ongoing transition from a primarily agrarian settlement to a semi-urban landscape, where agriculture remains vital, but urban growth and infrastructure development increasingly shape the village's socio-economic profile.

2.4.3 Physical Infrastructure

Raipur: The infrastructure and service status of Raipur Village reflect a well-developed, connected rural settlement with strong community facilities and essential amenities. Regular electricity supply and a functioning bus stand support daily mobility and household needs. Residents have access to drinking water through both pipeline supply and dug wells, indicating reliable water infrastructure. The presence of strong mobile networks from all major providers and internet access further enhances digital connectivity, enabling communication and access to online services.

Nurpur: The infrastructure and service status of Raipur village reflect a well-developed, connected rural settlement with strong community facilities and essential amenities. The village benefits from pucca road connectivity, ensuring smooth transportation and accessibility to nearby areas. Regular electricity supply and a functioning bus stand support daily mobility and household needs. Residents have access to drinking water through both pipeline supply and dug wells, indicating reliable water infrastructure. The presence of strong mobile networks

from all major providers and internet access further enhances digital connectivity, enabling communication and access to online services.

Kankutia & Kartickdanga: The villages exhibit a strong, well-balanced infrastructure network, complemented by active institutional participation. Both have pucca road connectivity, ensuring smooth transportation and access to nearby areas. The presence of a solar-based irrigation system highlights sustainable agricultural practices, while regular electricity supply, a functioning bus stand, and safe drinking water ensure reliable daily amenities. Strong mobile networks from all major providers, along with internet access, further enhance digital connectivity and communication.

Halsidanga: The village maintains a functional infrastructure and service framework that supports both daily life and community development. It has pucca road connectivity, ensuring smooth transportation, though a bus stand is not available, which limits direct public transport access. Regular electricity supply and safe drinking water provide reliable utilities for households. The presence of a reliable mobile network and internet access enhances communication and digital connectivity, reflecting the village's gradual modernization.

Srichandrapur: The village maintains a modest infrastructure framework that supports essential services but shows notable gaps in institutional outreach. It has pucca road connectivity, ensuring smooth transportation, though a bus stand is not available, limiting direct public transport access. Regular electricity supply and safe drinking water provide reliable utilities for households. The presence of a good mobile network and internet access enhances communication and digital connectivity, reflecting gradual modernization in the village.

Kamarpara: The village has a modest yet functional infrastructure that meets essential daily needs and supports community life. It has pucca road connectivity, ensuring smooth local transportation, and a functioning bus stand that facilitates travel to nearby areas. Regular electricity supply and safe drinking water from tap connections provide reliable utilities for households. The presence of a reliable mobile network and internet access enhances communication and digital connectivity, reflecting the gradual modernization of the village's service framework.

2.4.4 Institutional Infrastructure and Social Capital

Raipur: The village of Raipur also features community spaces such as a Village and children's library, a Community Hall (Yuva Sangha, REC), and eight active local clubs, fostering social engagement and collective activities. Institutionally, Raipur demonstrates strong accessibility across multiple sectors. It has three educational institutions, including the historic Raipur Sitikantha Memorial H.S. School (established in 1902), and three locally operated Common Service Centres providing digital services. Financial inclusion is supported by two operational banks-UCO Bank and West Bengal Grameen Bank-alongside three Anganwadi Centres, an Agricultural Credit Co-operative, and a Post Office. However, the village faces challenges in accessing healthcare, as there is no government healthcare centre within its boundaries, resulting in poor public health facilities. Despite this, 55 active Self-Help Groups empower women economically, and a Fair Price Shop ensures food security through the Public Distribution System. The overall institutional framework of Raipur reflects a robust and participatory community structure that supports holistic development across education, finance, and social welfare.

Nurpur: Nurpur also features vibrant community spaces, including a Village and Children Library, a Community Hall, six active local clubs, and a Yoga Centre (Bratee Dal), which collectively foster social engagement, cultural activities, and wellness. Institutionally, the village maintains a strong foundation of active community organisations. It has two educational facilities-one primary school and one Upper Primary School (MSK)-ensuring access to basic education. Two locally operated Common Service Centres provide digital services, while a Fair Price Shop ensures food security through the Public Distribution System. The presence of 143 active Self-Help Groups highlights women's empowerment and economic participation. Additionally, three Anganwadi Centres and one Farmers' Club contribute to social welfare and agricultural development. Although the village's Primary Health Centre offers limited services, Nurpur's overall institutional framework remains resilient. Its combination of educational, digital, and community facilities underscores a balanced and inclusive approach to rural development, strengthening the village's connectivity, social cohesion, and economic stability.

Kankutia & Kartickdanga: Community engagement is supported through two Village and Children Libraries, one Community Hall, four active local clubs, and one registered Farmer's Group, which collectively foster social interaction, cultural activities, and agricultural collaboration. Institutionally, Kankutia and Kartickdanga maintain a robust foundation of

community organizations. They host three educational facilities—two primary schools and one higher secondary school (Kankutia Santidev Ghosh Higher Secondary School, established in 2001)—ensuring access to quality education. One locally operated Common Service Centre provides digital services, while a Fair Price Shop ensures food security through the Public Distribution System. Although financial services are not available within the villages, residents have access to UCO Bank and West Bengal Grameen Bank located at Raipur, about 3 km away. The villages also have five Anganwadi Centre that support maternal and child welfare. In terms of social empowerment, 45 active Self-Help Groups strengthen women's economic participation, while two active User Groups (Binoy & Badal Swanirvor Gosthee) promote men's involvement in community development. A Primary Health Centre operates locally, though with limited services. Overall, Kankutia and Kartickdanga demonstrate a well-integrated infrastructure and institutional framework that supports holistic rural development across education, health, and community welfare. Their combination of sustainable practices, active social organizations, and accessible services reflects steady progress toward inclusive and resilient village growth.

Halsidanga: Community facilities include a village library, which serves as a local learning hub. However, there is no community hall, children's library, or yoga centre, indicating limited public gathering and recreational infrastructure. Educational access is comparatively stronger, with one primary school, one secondary school, and one higher secondary school available, ensuring continuity in local education. Healthcare access remains a challenge. A primary sub-centre is located 2 km away, while the nearest Primary Health Centre is about 8 km away, making medical services less accessible within the village itself. Social and economic participation is supported by 15 active Self-Help Groups, which empower women and strengthen community cooperation. A private Common Service Centre (CSC) provides digital services, while Public Distribution System (PDS) facilities ensure food security for residents. Financial and agricultural institutions are limited. Banks and co-operative societies are not located within the village but are accessible within 3 km, while there are no farmers' clubs or Farmer-Producer Organizations (FPOs). Overall, Halsidanga's infrastructure reflects a developing rural settlement with essential utilities and educational facilities in place, but notable gaps in healthcare and institutional outreach.

Srichandrapur: Community facilities include a village library, which serves as a local learning hub. However, there is no community hall, children's library, or yoga centre, indicating limited

public gathering and recreational infrastructure. Educational access is basic, with only one primary school available; there are no secondary or higher secondary schools, restricting opportunities for advanced education within the village. Healthcare access remains a challenge. A primary sub-centre is located 3 km away, while the nearest Primary Health Centre is about 8 km away, making medical services less accessible. Social and economic participation is supported by 12 active Self-Help Groups, which empower women and strengthen community cooperation. A private Common Service Centre (CSC) is available about 4 km away, providing digital services, while Public Distribution System (PDS) facilities ensure food security for residents. Financial and agricultural institutions are limited. Banks and co-operative societies are not located within the village but are accessible within 3 km, while there are no farmers' clubs or Farmer Producer Organizations (FPOs). Overall, Srichandrapur's infrastructure reflects a developing rural settlement with essential utilities in place but significant gaps in healthcare, education, and institutional support. The presence of active Self-Help Groups and access to PDS services, however, marks important steps toward inclusive community development.

Kamarpara: In terms of community facilities, the village has a library that serves as a local space for learning and engagement. However, there is no community hall, children's library, or yoga centre, indicating limited public gathering and recreational infrastructure. Educational access is limited: there is only one primary school, and there are no secondary or higher secondary schools, which restricts local educational advancement. Healthcare access remains a challenge - the village lacks a primary sub-centre, and the nearest Primary Health Centre is located about 8 km away, making medical services less accessible. Social and economic participation is supported by 23–25 active Self-Help Groups, which play a key role in women's empowerment and community cooperation. A private Common Service Centre (CSC) provides digital services, while Public Distribution System (PDS) facilities ensure food security for residents. There are no banks, co-operative societies, farmers' clubs, or Farmer-Producer Organizations (FPOs) within the village, limiting formal financial and agricultural institutional support. Overall, Kamarpara's infrastructure reflects a developing rural settlement with essential utilities in place but notable gaps in education, healthcare, and institutional outreach.

Across the six villages Raipur, Nurpur, Kankutia & Kartickdanga, Halsidanga, Srichandrapur, and Kamarpara the infrastructure and services reflect a mix of strengths and gaps. Pucca road connectivity, regular electricity, safe drinking water, and strong mobile networks are common

features, ensuring basic utilities and digital access. Community facilities such as libraries, clubs, and halls vary across villages, with some settlements offering vibrant social spaces while others have limited options. Educational infrastructure shows diversity: Raipur and Kankutia & Kartickdanga have higher secondary schools, Halsidanga has a full range of schools, while Nurpur, Srichandrapur, and Kamarpara remain restricted to primary education. Healthcare access is a consistent challenge-most villages rely on sub-centers or distant Primary Health Centers, limiting immediate medical support. Institutional strength is visible in the presence of Self-Help Groups (SHGs), which range from 12 in Srichandrapur to 143 in Nurpur, highlighting women's empowerment and community participation. Digital services through Common Service Centres (CSCs) and food security via Public Distribution System (PDS) are available in all villages, though financial institutions and farmer organizations are unevenly distributed.

Overall, the villages demonstrate progressive rural transformation: agriculture remains the backbone, but settlement growth, digital connectivity, and SHG activity are reshaping socio-economic dynamics. Persistent gaps in healthcare, higher education, and institutional outreach highlight areas for targeted development.

2.5 Agricultural Profile and Input Use

2.5.1 Irrigation and Cropping

Farmers depend on multiple irrigation sources, such as canals, river water, ponds, and groundwater, using channel systems, diesel pumps, and submersible pumps. Cropping patterns are influenced by irrigation availability and climatic variability.

2.5.2 Cost of Input and Labour

- Urea: ₹900/quintal
- DAP: ₹3,800/quintal
- NPK: ₹4,000/quintal
- Manure: ₹3,000/quintal
- Labour wages: ₹300–350/day
- Average irrigation expenditure: ₹16,000/ha

Rising input costs significantly reduce net farm income.

2.5.3 Advisory and Extension Services

Farmers access information from input dealers, REC and RKVK (Visva-Bharati), Krishi Vigyan Kendra, newspapers, radio, television, and digital platforms such as Kisan Suvidha.

2.5.4 Awareness and Utilization of Government Schemes

➤ Schemes with High Uptake

- PM-Kisan
- Kisan Credit Card (KCC)
- Fasal Bima Yojana
- Krishak Bandhu

➤ Schemes with Low Awareness

- Farmer Producer Organizations (FPOs)
- e-NAM and MSP
- Soil Testing Facilities
- ATMA, KPS, RKVY, AIF, PM-KMY, and SMAM

Raipur: Raipur Village demonstrates a more diversified and intensified agricultural system compared to other villages in the region. Agricultural land comprises 60.72% of the total area, with a Net Sown Area of 116.45 hectares and a Gross Cropped Area of 215.43 hectares, resulting in a notably high cropping intensity of 185%. This significantly higher cropping intensity indicates that Raipur farmers are practicing year-round cultivation with multiple crops on the same land, making efficient use of available resources across three distinct seasons. Unlike villages with two-season patterns, Raipur follows a three-season cropping system, demonstrating greater agricultural diversification. During the Kharif season, 116.45 hectares are cultivated with Aman Paddy, achieving a productivity of 45 quintals per hectare. The Rabi season expands cultivation to 69.87 hectares, with farmers growing Potato, Mustard, and Vegetables. Notably, Potato shows exceptionally high productivity at 295 quintals per hectare, while Mustard and Vegetables yield 12 quintals per hectare. The Summer season further extends cultivation to 29.11 hectares dedicated to Sesame, Chilli, and other vegetables, with Chilli demonstrating impressive productivity of 185 quintals per hectare, though Sesame yields only 10 quintals per hectare. This seasonal diversification allows farmers to maintain

continuous production and optimize land utilization throughout the year. Raipur Village benefits from consistent irrigation availability, with 80% of the area irrigated year-round and only 20% remaining unirrigated. The village taps multiple water sources, including canal water, river water, pond water, and groundwater, delivered through channel systems, diesel pumps, and submersible pumps. This reliable irrigation infrastructure supports the intensive three-season cultivation pattern, though it requires substantial investment averaging Rs. 16,000 per hectare.

Labour and mechanization costs are comparable to other villages, with wages ranging from Rs. 250–300 per day (with seasonal variation), mechanical ploughing at Rs. 9,000 per hectare, and bullock ploughing at Rs. 7,500 per hectare. However, Raipur's fertilizer use is more comprehensive, reflecting the higher productivity demands of intensive cultivation. Farmers invest in Urea (Rs. 900 per quintal), DAP (Rs. 3,800 per quintal), NPK at a specialized formulation of 10:26:26 (Rs. 4,000 per quintal), Manure (Rs. 3,000 per quintal), Potash (Rs. 3,000 per quintal), and Single Super Phosphate or SSP (Rs. 1,200 per quintal). Overall, Raipur Village's agricultural economy is characterized by intensive, diversified, and year-round farming with high cropping intensity, driven by reliable irrigation, vegetable and cash crop production, and substantial input investments to maximize productivity across multiple seasons.

Table 2.5 Crop Details of Raipur Village

Seasons	Area (Hectare)	Major Crops	Productivity (Quintal/Hectare)
Kharif	215.00	Aman Paddy	50
Rabi	74.89	Potato	380
		Mustard	10.5
Summer	33.45	Boro Paddy	52

Source: FGD with Stakeholders

Nurpur: The village of Nurpur demonstrates a mixed agricultural system centered on seasonal farming practices, with significant variations in land use and productivity. Agricultural land comprises 60.38% of the total area, with a Net Sown Area of 122.6 hectares and a Gross Cropped Area of 147.12 hectares, resulting in a cropping intensity of 120%. This indicates that farmers are intensifying production by cultivating the same land multiple times during the year. The village follows a two-season cropping pattern. During the Kharif season, nearly all available land, 122.6 hectares, are brought under cultivation with Aman Paddy as the major

crop, achieving a productivity of 45 quintals per hectare. Irrigation is almost universally available during this season, with 98.93% of the area irrigated and only 1.08% remaining unirrigated. However, the Rabi season shows a dramatic contraction, with cultivation limited to just 24.52 hectares dedicated to Mustard and Vegetables. Productivity during this season drops significantly to 10 quintals per hectare, and irrigation availability declines sharply to only 20%, leaving 80% of the land unirrigated. The village relies on multiple irrigation sources, including canal water, river water, pond water, and groundwater, with water delivery managed through channel systems, diesel pumps and submersible pumps. This infrastructure requires substantial investment, with average irrigation expenditure reaching Rs. 16,000 per hectare. Additional farming costs include labour at Rs. 300-350 per day (with seasonal variation), mechanical ploughing at Rs. 9,000 per hectare, and bullock ploughing at Rs. 7,500 per hectare. Fertilizer inputs constitute another significant expense, with farmers purchasing Urea (Rs. 900 per quintal), DAP (Rs. 3,800 per quintal), NPK (Rs. 4,000 per quintal), and manure (Rs. 3,000 per quintal). Overall, the village's agricultural economy is heavily dependent on Kharif paddy production and faces considerable seasonal fluctuations in both cropping area and resource availability.

Table 2.6 Crop Details of Nurpur Village

Seasons	Area (Hectare)	Major Crops	Productivity (Quintal/Hectare)
Kharif	122.60	Aman Paddy	45
Rabi	24.52	Mustard	10
		Vegetables	Moderate

Source: FGD with Stakeholders

Kankutia-Kartickdanga: The Village represents an exceptionally intensive agricultural system with the highest cropping intensity observed among the villages studied. Agricultural land comprises 85.15% of the total area, reflecting a strong agricultural orientation in the village economy. The village operates with a Net Sown Area of 343.37 hectares and a Gross Cropped Area of 618.07 hectares, resulting in a remarkable cropping intensity of 180%. This extraordinarily high cropping intensity demonstrates that farmers in this village practice highly intensive year-round cultivation with multiple crops planted sequentially on the same land, maximizing agricultural productivity and land utilization. The village follows a three-season cropping system that supports continuous agricultural production throughout the year. During the Kharif season, the largest cultivation area of 343.37 hectares is dedicated to Aman Paddy,

achieving a productivity of 52 quintals per hectare, notably higher than many other villages. The Rabi season witnesses substantial cultivation of 206.02 hectares with a diversified crop portfolio including Potato, Mustard, Wheat, and Vegetables. Potato demonstrates exceptional productivity at 375 quintals per hectare, far exceeding the productivity of Mustard (11 quintals per hectare) and Wheat (30 quintals per hectare). The Summer season further extends cultivation to 68.67 hectares with Boro Paddy, Vegetables, and Sesame, where Boro Paddy yields 50 quintals per hectare and Sesame yields only 10 quintals per hectare. This tri-seasonal pattern with diversified crops, particularly high-value vegetables and potato production, indicates a market-oriented farming approach. Irrigation availability in Kankutia-Kartickdanga is superior to most other villages, with excellent coverage across seasons. During the Kharif season, 80% of the area is irrigated with only 20% un-irrigated, while in the other season, irrigation reaches 100%, ensuring complete water availability year-round. The village taps multiple water sources, including canal water, river water, pond water, and groundwater, utilizing advanced delivery methods, including channel systems, diesel pumps, and notably, submersible pumps powered by both electric and solar energy. This modern infrastructure, particularly the inclusion of solar-powered irrigation systems, reflects progressive agricultural practices and reduced dependence on fossil fuels.

Table 2.7 Crop Details of Kankutia-Kartickdanga Village

Seasons	Area (Hectare)	Major Crops	Productivity (Quintal/Hectare)
Kharif	343.37	Aman Paddy	52
Rabi	206.02	Potato	375
		Mustard	11
		Wheat	30
Summer	68.67	Boro Paddy	52
		Sesame	10

Source: FGD with Stakeholders

Irrigation represents a substantial investment at Rs. 18,000 per hectare, the highest among the villages studied, reflecting the intensive nature of cultivation. Labour costs in Kankutia-Kartickdanga range from Rs. 250-300 per day with seasonal variation, consistent with other villages. However, mechanization costs are slightly lower, with mechanical ploughing at Rs. 8,500 per hectare and bullock ploughing at Rs. 7,500 per hectare. The village employs a comprehensive fertilizer strategy to support intensive production, with investments in Urea (Rs. 900 per quintal), DAP (Rs. 3,800 per quintal), NPK with a specialized formulation of 10:26:26 (Rs. 4,000 per quintal), Manure (Rs. 3,000 per quintal), Potash (Rs. 3,000 per quintal),

and Single Super Phosphate or SSP (Rs. 1,200 per quintal). Overall, Kankutia-Kartickdanga Village stands out for its highly intensive, year-round agricultural system with exceptional cropping intensity, reliable full-season irrigation infrastructure, including renewable energy options, diversified high-value crop production, particularly in potatoes and vegetables, and substantial input investments that reflect a commercially oriented, technology-enabled farming economy.

Halsidanga: Halsidanga Village demonstrates a highly intensive agricultural system with strong agricultural orientation and substantial land productivity. Agricultural land comprises 83.45% of the total area, indicating a predominantly farming-based economy. The village operates with a Net Sown Area of 219.63 hectares and a Gross Cropped Area of 363.34 hectares, resulting in a cropping intensity of 165.43%. This high cropping intensity indicates that farmers practice intensive year-round cultivation with multiple crops grown sequentially on the same land, though with lower intensity compared to the most advanced villages, reflecting a balanced approach to agricultural intensification. Halsidanga follows a three-season cropping system that maximizes agricultural production throughout the year. During the Kharif season, 215.00 hectares are cultivated with Aman Paddy, achieving a productivity of 50 quintals per hectare, a respectable yield that supports household food security and marketable surplus. The Rabi season witnesses a substantial contraction to 114.89 hectares with diversified crops including Potato, and Mustard. Notably, Potato demonstrates exceptional productivity at 380 quintals per hectare, among the highest observed, while Mustard yields only 10.5 quintals per hectare. The Summer season further extends cultivation to 33.45 hectares dedicated primarily to Boro Paddy, which achieves a productivity of 52 quintals per hectare. This tri-seasonal pattern with emphasis on paddy production and high-value potato cultivation reflects a strategy balancing subsistence food security with commercial income generation. Irrigation availability in Halsidanga is excellent and consistent across seasons, supporting the intensive cultivation pattern. During the Kharif season, 90% of the area is irrigated with only 10% remaining unirrigated, while in other seasons, irrigation reaches 100%, ensuring complete water availability year-round without any dependence on rainfall. Unlike villages with access to multiple water sources, Halsidanga relies on pond water and groundwater as its primary irrigation sources, indicating localized water management. The village employs diesel pumps and advanced submersible pumps powered by both electric and solar energy for water delivery, demonstrating adoption of modern and renewable irrigation technology. Irrigation represents a moderate investment at Rs. 16,000 per hectare, reflecting efficient water management. Labour

and mechanization costs in Halsidanga are competitive, with wages ranging from Rs. 250–300 per day with seasonal variation. Mechanical ploughing costs Rs. 9,000 per hectare, while bullock ploughing is slightly more economical at Rs. 7,800 per hectare. The village employs a comprehensive fertilizer strategy to support intensive production, with investments in Urea (Rs. 850 per quintal—the lowest cost observed among the villages), DAP (Rs. 3,900 per quintal), NPK with specialized formulation 10:26:26 (Rs. 4,000 per quintal), Manure (Rs. 3,000 per quintal), Potash (Rs. 3,000 per quintal), and Single Super Phosphate or SSP (Rs. 1,200 per quintal). Overall, Halsidanga Village represents a well-balanced agricultural economy characterized by high cropping intensity, reliable year-round full irrigation with renewable energy adoption, diversified crop production with emphasis on high-value potatoes and paddy, efficient cost management through competitive input prices, and sustainable farming practices that combine productivity with resource efficiency.

Table 2.8 Crop Details of Halsidanga Village

Seasons	Area (Hectare)	Major Crops	Productivity (Quintal/Hectare)
Kharif	215.00	Aman Paddy	50
Rabi	74.89	Potato	380
		Mustard	10.5
Summer	33.45	Boro Paddy	52

Source: FGD with Stakeholders

Srichandapur: The village demonstrates a highly agriculture-oriented economy, with significant land dedicated to farming. Agricultural land comprises 84.74% of the total area, one of the highest proportions among the villages studied, indicating a strong farming-based livelihood system. The village operates with a Net Sown Area of 170.89 hectares and a Gross Cropped Area of 240.89 hectares, resulting in an exceptionally high cropping intensity of 140.96%. This intensity reflects intensive sequential cropping across multiple seasons, demonstrating efficient use of available agricultural land to maximize production and income. Srichandapur follows a dynamic three-season cropping system that optimizes land productivity throughout the year. During the Kharif season, 165.89 hectares are dedicated to Aman Paddy cultivation, achieving a solid productivity of 53 quintals per hectare. The Rabi season involves a substantial area of 58.65 hectares with diverse crops including Potato and Mustard. Potato demonstrates the consistently high productivity of 380 quintals per hectare observed across high-performing villages, while Mustard yields 11.5 quintals per hectare. The Summer season extends cultivation to 16.35 hectares, primarily for Boro Paddy, which achieves a noteworthy

productivity of 56 quintals per hectare. This tri-seasonal pattern with emphasis on paddy production and high-value potato cultivation reflects a balanced strategy between food security and commercial income, with progressively smaller cultivation areas in successive seasons typical of regional farming practices. Irrigation in Srichandapur shows a unique pattern compared to other villages, indicating seasonal water availability challenges. During the Kharif season, irrigation covers only 45.02% of the area, with 46.74% remaining unirrigated, suggesting reliance on monsoon rainfall during this season. However, during other seasons, irrigation coverage reaches 100%, ensuring that dry-season crops receive full water support. The village taps pond water and groundwater as its primary irrigation sources, employing diesel pumps and modern submersible pumps powered by both electric and solar energy for water delivery. This mixed irrigation approach reflects adaptation to seasonal water availability patterns. Irrigation investment stands at Rs. 16,000 per hectare, consistent with regional standards. Labour and mechanization costs in Srichandapur are standard for the region, with labour wages ranging from Rs. 250-300 per day depending on seasonal demand. Mechanical ploughing costs Rs. 9,000 per hectare, while bullock-based ploughing is more economical at Rs. 7,800 per hectare. To support intensive multi-season production, the village employs a comprehensive fertilizer strategy including Urea (Rs. 850 per quintal), DAP (Rs. 3,900 per quintal), NPK with specialized formulation 10:26:26 (Rs. 4,000 per quintal), Manure and Potash (both at Rs. 3,000 per quintal), and SSP (Rs. 1,200 per quintal). Overall, Srichandapur Village represents a mature agricultural system characterized by high cropping intensity; monsoon-supported Kharif production complemented by full irrigation during dry seasons; high-yielding paddy varieties and potato cultivation, and comprehensive input management that supports sustained agricultural productivity and farmer income generation

Table 2.9 Crop Details of Srichandapur Village

Seasons	Area (Hectare)	Major Crops	Productivity (Quintal/Hectare)
Kharif	165.89	Aman Paddy	53
Rabi	58.65	Potato	380
		Mustard	11.5
Summer	16.35	Boro Paddy	56

Source: FGD with Stakeholders

Kamarpara: Kamarpara Village exhibits a unique land distribution, with non-agricultural use predominant at 67.74%, leaving 32.26% for agricultural activities. Despite this limited agricultural land base, the village achieves a respectable cropping intensity of 137.21%, with a

Net Sown Area of 138.47 hectares and a Gross Cropped Area of 189.99 hectares. This intensity indicates that the available farming land is utilized efficiently across multiple seasons to maximize output. The village follows a productive three-season cropping pattern characterized by high yields. In the Kharif season, the entire Net Sown Area of 138.47 hectares is dedicated to Aman Paddy, which achieves an impressive productivity of 53 quintals per hectare. The Rabi season involves 28.96 hectares of cultivation, focusing on Potato and Mustard. Similar to neighboring high-performing villages, Potato productivity here is very high at 380 quintals per hectare, while Mustard yields 11.5 quintals per hectare. The Summer season covers 22.56 hectares, primarily for Boro Paddy, which reaches a peak productivity of 56 quintals per hectare. This focus on high-yielding paddy varieties and cash crops like potatoes highlights a strong emphasis on maximizing caloric and economic returns from the land. Irrigation infrastructure in Kamarpara is robust and reliable. During the Kharif season, 30% of the land is irrigated, with 70% remaining unirrigated. However, during other seasons, irrigation coverage reaches 30%, ensuring that dry-season crops are fully supported. The village relies on pond water and groundwater as its primary water sources, with submersible pumps (both electric and solar-powered) for distribution. The average expenditure on irrigation is maintained at Rs. 16,000 per hectare, reflecting a standard investment level for the region's intensive practices.

Table 2.10 Crop Details of Kamarpara Village

Seasons	Area (Hectare)	Major Crops	Productivity (Quintal/Hectare)
Kharif	138.47	Aman Paddy	53
Rabi	28.96	Potato	380
		Mustard	11.5
Summer	22.56	Boro Paddy	56

Source: FGD with Stakeholders

Economic inputs for farming are consistent with regional trends. Labour costs range between Rs. 250 and Rs. 300 per day, depending on the season. Mechanization costs are set at Rs. 9,000 per hectare for machine ploughing and Rs. 7,800 per hectare for bullock-based ploughing. To sustain high yields, farmers use a comprehensive range of fertilizers, including Urea at Rs. 850 per quintal, DAP at Rs. 3,900 per quintal, and NPK (10:26:26) at Rs. 4,000 per quintal. Other essential inputs include Manure and Potash (both at Rs. 3,000 per quintal) and SSP at Rs. 1,200 per quintal. Overall, Kamarpara is characterized by high yields in paddy and potato production, supported by modern, solar-integrated irrigation and intensive use of inputs, despite having a smaller share of agricultural land.

Chapter - 3: Role of Visva-Bharati in Aadarsh Gram

3.1 Introduction

Visva-Bharati has consistently undertaken a wide range of initiatives in its adopted villages, ensuring that development is not only sustained but also deeply rooted in community participation. These activities-spanning training programmes, awareness campaigns, and livelihood interventions-are primarily guided and financially supported by the Department of Lifelong Learning (Rural Extension Centre) under the Palli Samgathana Vibhaga (PSV). The involvement of this department has been crucial in shaping the trajectory of rural transformation, as it provides both institutional backing and practical guidance to the communities.

Equally significant is the documentation of success stories emerging from these villages. Capturing such narratives during surveys is essential, as they vividly illustrate the transformation brought about by Visva-Bharati's interventions. These stories serve as living testimonies of resilience and progress, highlighting the contrast between pre-intervention challenges and post-intervention achievements. They reveal how communities have adapted to new opportunities, improved their socio-economic conditions, and strengthened their collective identity through the support of Visva-Bharati.

The following section, therefore, presents the success stories of six adopted villages, offering an elegant account of how institutional engagement has reshaped local realities. These accounts not only underscore the tangible outcomes of development programmes but also reflect the broader dynamics of empowerment, sustainability, and community-driven change fostered by Visva-Bharati's initiatives.

3.2 Activities and Success Stories

3.2.1 Raipur

Activities and Intervention by Visva-Bharati:

- Development of a mango orchard at the village by RKVK, Sriniketan in 2002-03.
- Maize cultivation initiative started with the help of seed technology for the farmers by RKVK, Sriniketan in 2002-03.

- Training on jute artwork on paper pulp for village women by REC, PSV in 2004-05.
- Youth of the Village Development Societies (VDS) under the operational area of the Department for Extension Programmes has taken active role for creating awareness about prevention of pandemic COVID 19 in the village.
- Infrastructural development in irrigation (Sprinkler distribution) for the farmers by RKVK, Sriniketan in 2022-23.
- Library resources (Computer, Printer) by REC, PSV.
- Awareness Programme by RKVK, Sriniketan in 2025.
- Digital Awareness Campaign by CJMC, Visva-Bharati in 2025.
- Support provided for Cultural Activities and distribution of books by REC, PSV (Annually).

Success Story

Mrs. Mallika Das, a 48-year-old woman from Raipur village in Bolpur-Sriniketan, stands as a remarkable example of how skill, determination, and community spirit can transform lives. With formal education only up to Class 9, she defied the odds by embracing training in jute artistry offered by the Rural Extension Centre, Visva-Bharati, during 2004–05. The programme, focused on jute artwork on paper pulp, became the turning point in her life. Inspired by the possibilities of sustainable craftwork, she established *Gouranga Hastashilpa* in 2006-07, a domestic organization run from her own home. Though unregistered, the enterprise quickly grew into a hub of creativity and empowerment.

What began as a modest initiative soon blossomed into a livelihood opportunity for many women in her village. Today, *Gouranga Hastashilpa* employs 15 women and trains another 12, all of whom are gaining financial independence and social recognition through their craft. The products-ranging from intricately designed horses, owls, elephants, and Lord Ganesh idols to functional items like pen stands-reflect both artistry and utility. These creations, rooted in traditional jute work, have found markets not only in local and regional fairs but also at the national level and even internationally, reaching customers in the USA. This global reach underscores the universal appeal of indigenous craftsmanship when nurtured with dedication. Beyond economic success, Mallika Das’s journey is a story of empowerment. By creating a space where rural women can learn, work, and earn, she has challenged social norms and opened doors for others who once had limited opportunities. Her initiative demonstrates how grassroots entrepreneurship can foster self-reliance, preserve cultural heritage, and contribute

to sustainable development. The ripple effect of her work is visible in the growing confidence of her trainees, who now see themselves not just as artisans but as contributors to a larger movement of rural transformation.



Mrs. Mallika Das and Her Husband



Mrs. Mallika Das is working with her fellow

Mallika's story is more than a tale of personal achievement-it is a testament to the power of skill development, community solidarity, and sustainable practices. It shows how a single individual, armed with training and vision, can ignite change that resonates far beyond her village. *Gouranga Hastashilpa* is not just a craft enterprise; it is a beacon of hope, proving that empowerment through artistry can bridge the gap between tradition and modern opportunity.

3.2.2 Nurpur

Activities and Intervention by Visva-Bharati:

- Library resources (Computer, Books) by REC, PSV.
- Cultural Activities by REC, PSV.
- Financial help for the annual cultural programme.
- Continuous support in the functioning of Bratee dal in Nurpur in terms of finance by REC as per allotment in the Annual Programme.
- Providing the cultural platform to enhance themselves in Maghmela, Halakarshana by REC (provides Travelling Allowances, Tiffin).
- Promoting local Pottery, Sports and Culture through Nurpur Aambagan Gram Unnyan Samity (NAGUS).
- Youth of the Village Development Societies (VDS) under the operational area of the Department for Extension Programmes has taken active role for creating awareness about prevention of pandemic COVID 19 in the village.
- Organize an awareness rally every year jointly by REC and NAGUS on 6th February (Inauguration Day of Sriniketan Experiment) and 5th June (World Environment Day).
- Tailoring training by REC, Visva-Bharati (2022-23).

Success Story

The story of Bratee Dal in Nurpur stands as a vivid example of how Visva-Bharati's vision for rural reconstruction continues to inspire cultural enrichment and social transformation. Rooted in Rabindranath Tagore's pioneering Sriniketan experiment of 1922, and guided by Leonard Knight Elmhirst, the initiative was conceived as a way to blend education, culture, and community service into the everyday lives of villagers. From its inception, Bratee Dal embodied the spirit of Shramadan (voluntary labour for collective welfare), while nurturing creativity, discipline, and social responsibility among the youth.

Over the years, the practice of Bratee Dal has grown into a dynamic force for community development. Young members actively participate in village festivals, awareness rallies, environmental campaigns, and cultural gatherings, ensuring that tradition and modernity coexist in harmony. Through music, drama, storytelling, and folk art, they have revitalized indigenous cultural expressions, while their involvement in literacy drives, health initiatives, and environmental stewardship has strengthened the social fabric of the village. These activities

not only preserve heritage but also cultivate empathy, cooperation, and leadership among the younger generation, preparing them to take on future responsibilities with confidence.



Bratee dal performance in the village



Bratee dal performance in the village cultural event

The impacts of Bratee Dal are visible in multiple dimensions of village life. It has enriched cultural identity by keeping folk traditions vibrant, fostered social cohesion by bringing together people across caste, age, and gender, and empowered youth by giving them recognition and leadership opportunities. The initiative has also created a strong sense of community identity, positioning Nurpur as a model of rural cultural integration. By blending

art, education, and rural values, Bratee Dal ensures that Tagore's vision of holistic development remains alive, sustainable, and relevant for generations to come.

This success story demonstrates how a cultural movement, when nurtured with institutional support and community participation, can transcend its original purpose to become a beacon of empowerment, unity, and heritage preservation. Nurpur's journey with Bratee Dal is not merely about cultural activities, but also about shaping resilient communities that thrive on shared values, creativity, and collective responsibility.



Village awareness programme by Bratee dal

3.2.3 Kankutia and Kartickdanga

Activities and Intervention by Visva-Bharati

- Library resources (Computer, Printer, Books) by REC, PSV.
- Cultural Activities by REC, PSV.
- Financial help for the cultural activities.
- Providing the cultural platform to enhance themselves in Maghmela, Halakarshana by REC (provides Travelling Allowances, Tiffin).
- Organize an awareness rally every year jointly by REC, PSV and Local 2 Libraries on 6th February (Inauguration Day of Sriniketan Experiment) and 5th June (World Environment Day).
- Periodic technical advice from RKVK, Sriniketan and PSB, VB.
- Awareness programme to promote Horticulture and Organic Farming was organized by REC, PSV in 2020-21 under Agricultural Extension Activities.

- Youth of the Village Development Societies (VDS) under the operational area of the Department for Extension Programmes has taken active role for creating awareness about prevention of pandemic COVID 19 in the village.
- Consultation provided by REC and RKVK, Sriniketan for Formation of a registered farmer's group, taking consultation from REC and RKVK, Sriniketan in 2019.
- Visited by the then Honourable Vice-Chancellor, and 50 Pcs of Mango Saplings were provided by REC, PSV, Visva-Bharati in 2017-18 to establish a Mango Orchard.
- Awareness programme on Horticulture and Swachha Bharat Abhijan was organized by REC, PSV, and Department of Horticulture, VB in 2017-18.
- Training given on Pisciculture for villagers by RKVK, Sriniketan in 2014-15.

Success Story

The story of Mr. Falguni Chatterjee, a 49-year-old entrepreneur from Kankutia and Kartickdanga in Bolpur-Sriniketan, is a powerful example of how creativity, institutional support, and community participation can converge to transform rural livelihoods. With only a Class XII education, she began her journey by crafting copper wire art from her home, turning a modest domestic enterprise into a thriving livelihood opportunity. Her determination and skill attracted the attention of Visva-Bharati University, which played a pivotal role in expanding her reach. By providing free stalls at Pous Mela and Sriniketan Mela, the university enabled her to showcase her work beyond the confines of her village, connecting her directly with buyers and markets at local, regional, and eventually national levels. This exposure not only enhanced the visibility of her craft but also legitimized her enterprise, allowing her to transition from a home-based artisan to a recognized entrepreneur.

The impact of this transformation has been profound. Today, Falguni employs twenty-six rural women, offering them stable income and financial independence while simultaneously empowering them with dignity and recognition in their community. What began as a small initiative has grown into a model of women's collective empowerment, where each participant contributes to and benefits from the enterprise's success. The expansion of her market reach has ensured economic stability, while the recognition she has gained has elevated her social status, instilling confidence and pride in both her and her team.

Beyond individual success, Mr. Falguni's journey reflects the broader vision of sustainable rural development. Her enterprise demonstrates how university-community collaboration can

nurture entrepreneurship, create employment, and preserve traditional craft practices while adapting them to modern markets. By blending artistry with livelihood creation, she has shown that rural women can be at the forefront of economic and social transformation. Her copper wire art, now admired across fairs and exhibitions, is more than a product-it is a symbol of resilience, empowerment, and the possibilities that emerge when institutional support meets grassroots initiative.



Artwork of Mr. Falguni Chatterjee



Mr. Falguni Chatterjee and his art in Maghmela

This success story underscores how a single entrepreneur's determination, when supported by the right opportunities, can ripple outward to empower dozens of women, strengthen

community identity, and contribute to sustainable development. Mr. Falguni Chatterjee's enterprise stands as a beacon of hope, proving that rural creativity, when nurtured, can flourish into a source of empowerment and pride for generations to come.

Another notable success story has emerged particularly in Kartickdanga. The journey of the *Kartickdanga Kalimata Jal Byaboharkaree Samity* in the villages of Kankutia and Kartickdanga, Bolpur-Sriniketan, illustrates how small interventions can blossom into sustainable livelihoods and community resilience. In 2018, the Rural Extension Centre (REC) under Palli Samgathana Vibhaga (PSV) of Visva-Bharati, together with RKVK Sriniketan, provided fifty mango saplings and continuous technical support to local farmers. This initial assistance, coupled with guidance in pest control, soil management, and disease prevention, laid the foundation for a registered farmer's group that could collectively plan and manage agricultural activities. The intervention was further strengthened by the West Bengal Accelerated Development of Minor Irrigation Project (WBADMIP), a World Bank-supported initiative, which reshaped twenty-two ponds in 2019–20. This not only improved irrigation but also opened avenues for pisciculture, while simultaneously expanding the orchard to include mango, jackfruit, guava, lemon, mosambi, and currant trees.

The transformation of these villages is remarkable. Women, once confined to household responsibilities, became active participants in orchard and fish farming, gaining financial independence and social recognition. Local youth found employment in orchard maintenance, harvesting, and fishery activities, ensuring both seasonal and permanent job opportunities. Families diversified their income streams, reducing dependence on a single crop and building resilience against climate shocks. The registered farmer group fostered collective bargaining power, better market access, and stronger social cohesion, while training programmes enhanced farmers' technical knowledge in sustainable water use and pest management.

Beyond immediate economic gains, the initiative has created long-term social and intergenerational impacts. Improved household income has enabled families to invest in children's education and healthcare, ensuring a brighter future for the next generation. Efficient pond management has secured water availability for irrigation and fish farming, embedding sustainability into the community's agricultural practices. The orchards, now thriving with multiple fruit varieties, stand as living proof of how institutional support, community participation, and integrated farming can reshape rural livelihoods.

This success story is not merely about saplings growing into orchards; it is about the blossoming of confidence, empowerment, and resilience within the community. It demonstrates how a carefully nurtured initiative can evolve into a sustainable livelihood model, balancing economic growth with social empowerment and environmental stewardship. The villages of Kankutia and Kartickdanga today embody the spirit of collective progress, showing how rural communities can flourish when tradition, innovation, and institutional support converge.



Glimpse of Kartickdanga



Mango orchard in the initial stage



Mango orchard in the productive stage

3.2.4 Halsidanga

Activities and Intervention by Visva-Bharati:

- Library resources, (Books, Almirah) provided by REC, PSV.
- Financial help for the annual cultural programme by REC, VB.
- Providing the platform to enhance themselves and showcasing their handicrafts in Poushmela, Maghmela and other celebrated programmes by REC as well as Visva-Bharati.
- Periodic technical advice and training from RKVK, Sriniketan and REC, VB for agricultural development as well as increasing awareness.
- Various training programmes have been jointly arranged by RKVK, Sriniketan and the Agriculture Departments of PSB, VB since 1980, covering the cultivation of several vegetables (such as brinjal, potato, and pointed gourd) as well as livestock rearing.
- A Training on “Book Binding” was given by Shilpa Sadana, VB in 1984-85.
- A “Bratee Dal” was formed in 2004-05 by REC, but it stopped functioning in 2023-24 due to the reluctance of the village’s current youth.
- Youth of the Village Development Societies (VDS) under the operational area of the Department for Extension Programmes has taken active role for creating awareness about prevention of pandemic COVID 19 in the village.
- Training given on copper wire handicrafts by REC, VB in 2012, where 5 village women participated and took the training.

Success Story

Mrs. Susmita Mondal's journey with Maa Durga Hastashilpa in Halsidanga, Illambazar, is a shining example of how skill development and determination can transform lives and communities. Born and raised in Halsidanga, Susmita, a Higher Secondary passed, attended training in copper wire handicrafts at the Rural Extension Centre (REC), PSV, Visva-Bharati in 2012. This training, rooted in traditional Indian folk-inspired art, became the turning point in her life. With creativity and perseverance, she established Maa Durga Hastashilpa in 2019, formally registering her enterprise through the DIC Office in Suri, and began operating from her own home. Also, she owns "Udyam Card" and "Shilpi Bhata Card", officially known as "Lokprasar Prkalpo", is a financial assistance scheme by the Government of West Bengal.

What started as a modest initiative has grown into a thriving domestic organization specializing in copper wire artistry. The products, intricately crafted idols of gods and goddesses, ornaments, and decorative items which reflect both cultural heritage and modern craftsmanship. Today, Susmita employs 15 women from her village, offering them not only financial independence but also dignity and recognition in society. Her enterprise has become a centre of empowerment, where women collaborate, learn, and contribute to sustaining traditional artistry while building sustainable livelihoods.

The transformation in Susmita's own life is remarkable. Before training, her annual income was barely INR 6,000, but through her enterprise, she now earns approximately INR 200,000 per year. This rise in income has not only improved her family's standard of living but also inspired other women in Halsidanga to pursue skill-based entrepreneurship. The reach of her products has expanded far beyond her village, finding buyers at regional and national fairs, and even crossing borders to Myanmar once a year on order-basis. This international recognition highlights the universal appeal of indigenous craftsmanship when nurtured with dedication and vision.

Beyond economic success, Maa Durga Hastashilpa embodies empowerment and resilience. By creating opportunities for rural women, Susmita has challenged traditional norms and fostered a spirit of collective progress. Her enterprise demonstrates how grassroots entrepreneurship, supported by institutional training, can preserve cultural heritage while simultaneously opening doors to modern markets. Today, Susmita Mondal stands as an example of hope in Halsidanga, proving that artistry, when combined with determination and community spirit, can transform lives and empower future generations as well.



Mrs. Susmita Mondal's art craft

3.2.5 Srichandrapur

Activities and Intervention by Visva-Bharati:

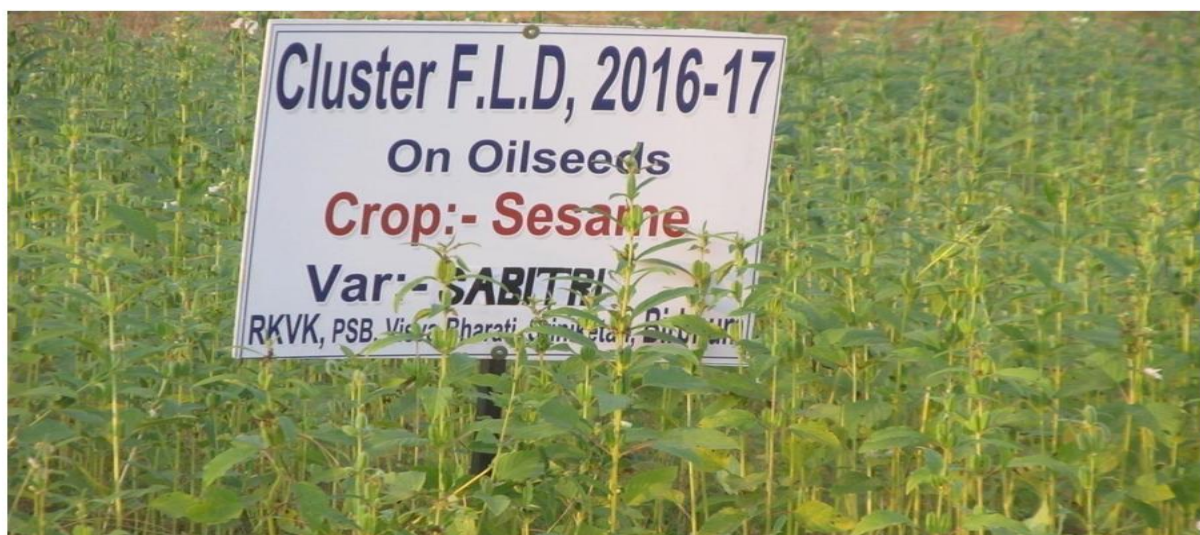
- Library resources, (Books, Almirah) provided by REC, PSV.
- Financial help for the annual cultural programme by REC, VB.
- Providing the platform to enhance themselves and showcasing their agricultural produces in Maghmela by REC.
- Periodic technical advice and training from RKKV, Sriniketan and REC, VB for the cultivation of several vegetables (such as potato, cauliflower, cabbage etc.
- Awareness programme to promote Horticulture and Organic Farming was organized by REC, PSV in 2020-21 under Agricultural Extension Activities.
- Youth of the Village Development Societies (VDS) under the operational area of the Department for Extension Programmes has taken active role for creating awareness about prevention of pandemic COVID 19 in the village.
- Cluster FLD (Frontline Demonstration) on Kharif Sesame in 2016-17 organized by the Rathindra KVK, Birbhum at the Vegetative Growth Stage.

Success Story

Mr. Paritosh Biswas, a 45-year-old progressive farmer from Srichandrapur village in Illambazar block, stands as a shining example of how institutional support and continuous

learning can transform rural livelihoods. Over the years, he has actively participated in various agricultural training programmes, particularly those focused on vegetable cultivation, organized by the Rural Extension Centre (REC) under Palli Samgathana Vibhaga, Visva-Bharati. These trainings not only enhanced his technical knowledge but also instilled confidence in adopting innovative farming practices.

His association with REC has brought him both tangible and intangible benefits. In 2025, he received seeds of nut, which added diversity to his cropping pattern. Earlier, in 2024, REC provided him with a platform to exhibit his unique produce, i.e., cauliflowers, cabbages, and broccoli at Maghmela, giving him visibility among wider audiences and connecting him to new market opportunities. He also benefited from Rathindra Krishi Vigyan Kendra (RKVB), PSB, from where he got sesame seeds in 2016-17. Such exposure has been crucial in showcasing the potential of innovative vegetable varieties and in motivating other farmers in the locality.



Mr. Paritosh Biswas's cultivation

The periodic technical guidance and training sessions offered by REC, especially in vegetable production, have had a measurable impact on his livelihood. By adopting improved cultivation techniques and diversifying his crops, he has witnessed a steady rise in his farming income, currently increased by 15 to 20 percent. This growth not only strengthens his household economy but also reflects the broader success of knowledge-driven agricultural development. Therefore, his journey highlights the importance of sustained institutional support, farmer training, and market linkages in rural development. His success story is not just about higher yields or increased income-it is about resilience, innovation, and the empowerment of small

farmers who, with the right guidance, can transform their agricultural practices into sustainable and profitable ventures.



Mr. Paritosh Biswas's cultivation

3.2.6 Kamarpara

Activities and Intervention by Visva-Bharati:

- Library resources, (Books, Almirah) provided by REC, PSV.
- Cultural Activities by REC, PSV.
- Financial help for the cultural activities.
- Providing the platform to enhance themselves and showcasing their handicrafts in Poushmela, Maghmela and other celebrated programmes by REC as well as Visva-Bharati.
- Organize an awareness rally every year jointly by REC, PSV and Local Library on 6th February (Inauguration Day of Sriniketan Experiment) and 5th June (World Environment Day).
- Periodic technical advice from RKVK, Sriniketan and PSB, VB.
- Establishment of 15 Self-Help Groups (SHG) by taking technical help of REC to empower the village women.
- Youth of the Village Development Societies (VDS) under the operational area of the Department for Extension Programmes has taken active role for creating awareness about prevention of pandemic COVID 19 in the village.
- Training given on Jute Craft making, Embroidery and Applique for villagers by REC and Shilpa Sadana, Sriniketan before 2000.

Success Story

Mr. Mihir Gupta and Mrs. Hena Gupta of Kamarpara, Illambazar, embody the spirit of rural entrepreneurship and artistic resilience. With formal education only up to the secondary level, both of them chose to pursue their passion for craftwork through dedicated training and experiential learning. Mr. Gupta honed his skills over seven years at Shilpa Sadana, Visva-Bharati, while Mrs. Gupta gained expertise through hands-on practice at the Rural Extension Centre (REC) and Shilpa Sadana. Their journey reflects how determination and institutional support can nurture creativity into livelihood opportunities.

In 1995, from their own home in Kamarpara village, they established an unregistered domestic enterprise specializing in jute side bags, shopping bags, and exquisite embroidery and applique art on khadi, suti, and silk fabrics. Over time, their artistry expanded to include Punjabi, table cloths, table runners, sarees, kurtas, and salwar kameez, blending traditional techniques with modern utility. What began as a modest household initiative has grown into a vibrant organization employing ten women, all of whom have found financial independence and dignity through this collective effort.

The enterprise's reach has steadily grown from local and regional markets to national exhibitions and even international buyers in the USA. Their products, rooted in indigenous craft traditions, have gained recognition for their quality, creativity, and cultural authenticity. By combining jute artistry with embroidery and applique, the Guptas have created a unique position that appeals to diverse audiences while preserving traditional skills.

Beyond economic success, their initiative has had profound social impact. By employing women from the village, they have fostered empowerment, skill development, and community solidarity. The enterprise has become a beacon of sustainable rural development, showing how grassroots creativity, when nurtured by institutions like Visva-Bharati, can evolve into a livelihood model that balances cultural heritage with modern market demands.

The story of Mihir and Hena Gupta is not just about craftwork, it is about resilience, empowerment, and vision. Their journey demonstrates how rural households can transform into centres of creativity and opportunity, inspiring others to believe that with skill, perseverance, and community support, even small beginnings can lead to global recognition. Their enterprise stands today as a testament to the power of art in shaping livelihoods and bridging tradition with modern opportunity.



Mr. Mihir Gupta and Mrs. Hena Gupta with their embroidery and applique artwork



Mr. Mihir Gupta and Mrs. Hena Gupta with their jute craftwork



Mr. Mihir Gupta and Mrs. Hena Gupta with their jute craftwork

Chapter - 4: Potentiality and Performances

4.1 Introduction

Rural development has emerged as a major priority for achieving balanced regional development and sustainable economic growth. The concept of a Model Village emphasizes holistic development by integrating physical infrastructure, agricultural productivity, economic opportunities, environmental sustainability, and social well-being. Rather than focusing on a single aspect of development, the model village approach seeks to create self-reliant villages capable of providing improved livelihoods, quality public services, and environmental resilience. To evaluate the developmental status of the selected villages, the present study developed a Model Village Potential Index (MVPI). The MVPI provides a scientific and quantitative framework for assessing the overall developmental potential of villages by combining multiple dimensions into a single composite index. The framework enables comparison among villages, identification of strengths and weaknesses, and formulation of appropriate policy interventions.

4.2 Model Village Potential Index

The MVPI is rooted in the idea that villages are the fundamental units of civilization and must be developed as self-sufficient centers of excellence. As highlighted in Ponnusamy et al. (2015), model villages should ensure food security, education, healthcare, sanitation, housing, and good governance, while promoting equality, social justice, and eco-friendly agricultural practices. The MVPI operationalizes these ideals by quantifying village performance across multiple dimensions. In this study, the MVPI framework is primarily based on the methodology of Ponnusamy et al. (2015) and has been refined through focus group discussions (FGDs) with local stakeholders.

4.2.1 Selection of Indicators

The MVPI framework is structured around five indicators of rural development, adapted from the model village components described in the article:

1. Infrastructure – The infrastructure dimension measures the availability and quality of essential public facilities such as roads, drinking water, electricity, educational

institutions, healthcare, communication, internet access, public distribution system, libraries, and governance services.

2. Economic – The economic dimension evaluates financial inclusion, employment opportunities, poverty, availability of food and livestock products, women's participation in the workforce, insurance coverage, and micro-enterprise development.
3. Farming (Agriculture and Livestock) – The farming dimension represents the productive capacity of agriculture through assessment of irrigation, crop diversification, mechanization, soil health, livestock development, veterinary services, climate-resilient agriculture, farmer organizations, storage, processing, and extension support.
4. Social – The social dimension measures community cohesion, literacy, gender equality, cultural participation, social justice, prevalence of social evils, and communal harmony.
5. Environmental – The environmental dimension evaluates renewable energy, waste management, biodiversity conservation, climate awareness, pollution control, disaster preparedness, rainwater harvesting, and natural resource management.

Together, these pillars ensure that the MVPI captures the holistic reality of village life, balancing physical, economic, social, and ecological dimensions. This study encompasses 87 sub-indicators across the five indicators above, ensuring that every aspect of village life is captured in the assessment. The study counted 17 sub-indicators for the Infrastructure indicator, 13 for the Economic indicator, 35 for the Farming indicator, 10 for the Social indicator, and 12 for the Environmental indicator, respectively.

4.2.2 Scoring System

Each sub-indicator is scored on a 0–10 scale, reflecting performance levels:

- 0.01–4.00: Low performance
- 4.01–7.00: Moderate performance
- 7.01–10.00: High performance

The average score for each major indicator is calculated by summing the scores of all its sub-indicators and dividing by the number of sub-indicators.

For each major indicator:

$$\text{Average Score of Indicator } (A_j) = \frac{\sum_{i=1}^n S_i}{n}$$

A_j = Average Score of Indicator j

S_i = Score of each sub-indicator

n = Number of sub-indicators under that major indicator

4.2.3 Average Score Performance

Infrastructure Indicator:

Table 4.1 Average Score of Infrastructural Indicator

Sl	Sub-Indicators	Average Score						
		Raipur	Nurpur	Kankutia & Kartickdanga	Halsidanga	Srichandrapur	Kamarpara	All
1	Types of roads and their accessibility	8.00	9.00	7.50	7.50	6.00	8.00	7.67
2	Drainage and sanitation	7.00	7.00	4.25	7.00	6.50	2.00	5.63
3	Safe drinking water facilities	8.00	8.00	8.00	7.50	7.50	7.00	7.67
4	Electricity	9.00	9.00	8.50	8.00	7.00	7.00	8.08
5	Type of houses (kutch/pucca)	8.00	6.50	8.00	9.00	9.00	6.00	7.75
6	Village community centre and its usage	8.00	7.00	8.50	0.00	0.00	0.00	3.92
7	School and enrolment	9.00	9.00	9.50	9.00	9.00	8.00	8.92
8	Health facilities	2.00	7.00	7.50	4.50	4.00	4.00	4.83
9	Communication facilities	8.00	9.00	7.50	7.00	5.00	8.00	7.42
10	PDS service	9.00	10.00	9.50	8.00	7.50	9.00	8.83
11	Post Office Service	6.00	5.00	3.50	7.00	7.00	7.00	5.92
12	Police Station Service	8.00	8.00	8.00	9.00	9.00	7.00	8.17
13	Governmental office Service	7.00	6.00	6.75	8.00	8.00	5.00	6.79
14	E-governance facility	7.00	5.00	6.50	8.00	8.00	6.00	6.75
15	Cyber-cafe service	8.00	9.00	2.00	7.00	7.00	7.50	6.75
16	Village Library	9.00	9.00	8.00	9.00	9.00	9.00	8.83
17	Internet Accessibilities	10.00	10.00	7.50	9.00	9.00	9.00	9.08
Average Score of Infrastructure Indicator		7.71	7.85	7.12	7.32	6.97	6.44	7.24

Source: FGD with Stakeholders

Infrastructure emerged as the strongest component across all villages, with an overall average score of 7.24 shown in Table 4.1, indicating high levels of infrastructural development. Among the villages, Nurpur achieved the highest infrastructural score (7.85), closely followed by Raipur (7.71) and Halsidanga (7.32). Kamarpara recorded the lowest score (6.44), although it still remained within the moderate-to-high-performance category. The analysis reveals that almost all villages have excellent access to electricity, schools, internet connectivity, public distribution systems, libraries, and drinking water facilities. Average scores exceeding 8 for these indicators demonstrate substantial public investment in rural infrastructure. However, certain deficiencies remain. Health facilities scored only 4.83, indicating inadequate availability of medical services. Village community centres also showed poor performance (3.92), especially in Halsidanga, Srichandrapur, and Kamarpara where such facilities were absent. Drainage and sanitation facilities require further improvement in Kankutia & Kartickdanga and Kamarpara. Overall, the infrastructural base of the study villages is relatively strong and provides a favourable foundation for future rural development.

Economic Performance

From Table 4.2, the overall economic indicator score is approximately 5.48, indicating moderate economic development. Halsidanga recorded the highest economic score (6.23), followed by Srichandrapur (5.62) and Raipur (5.69). Nurpur exhibited the lowest economic performance (4.54). Financial inclusion is one of the major strengths of the study villages, with universal bank account ownership receiving a perfect score of 10. Self-help groups are also functioning effectively.

Despite these achievements, several challenges remain:

- limited employment opportunities,
- weak micro-enterprise development,
- low insurance coverage,
- inadequate livestock-based economic activities,
- limited female workforce participation.

The findings indicate that although financial inclusion has expanded significantly, productive employment generation and rural entrepreneurship have not progressed at the same pace.

Table 4.2 Average Score of Economic Indicator

Sl.	Indicators	Average Score						
		Raipur	Nurpur	Kankutia & Kartickdanga	Halsidanga	Srichandrapur	Kamarpara	All
1	Proportion of account holders in bank	10.00	10.00	10.00	10.00	10.00	10.00	10.00
2	Proportion of APL (Above Poverty Line) and BPL (Below Poverty Line) families	8.00	4.00	7.00	8.00	6.00	5.00	6.33
3	Presence of Self-Help Groups (SHGs)	10.00	8.00	9.00	8.00	8.00	8.00	8.50
4	Proportion of insurance holders	3.00	5.00	6.00	3.00	2.00	2.00	3.50
5	Proportion of credit/debit card holders	7.00	5.00	6.50	7.00	5.00	5.00	5.92
6	Proportion of the population approaching moneylenders	3.00	6.00	3.00	9.00	9.00	8.00	6.33
7	Availability of foodgrains	10.00	3.00	8.50	10.00	9.00	9.00	8.25
8	Availability of Milk	3.00	2.00	4.00	7.00	7.00	3.00	4.33
9	Availability of eggs and meat	3.00	2.00	2.00	4.00	4.00	6.00	3.50
10	Employment opportunities	4.00	4.00	2.50	4.00	4.00	3.00	3.58
11	Microenterprises	1.00	1.00	1.00	0.00	0.00	2.00	0.83
12	General Poverty	7.00	4.00	5.00	8.00	6.00	5.00	5.83
13	Female at work	5.00	5.00	4.25	3.00	3.00	6.00	4.38
Overall Economic Indicator		5.69	4.54	5.29	6.23	5.62	5.54	5.48

Source: FGD with Stakeholders

Farming Indicator

The farming indicator recorded the overall average score of 4.55 shown in Table 4.3, indicating a moderate agricultural sustainability. Halsidanga (5.49) and Kankutia & Kartickdanga (5.30) recorded relatively high farming scores, whereas Nurpur obtained low at only 3.47 comparing the villages. The assessment revealed several weaknesses:

- Very limited adoption of organic farming,
- Absence of seed banks,

- Absence of Farmer-Producer Organizations (FPOs),
- Poor promotion of natural farming,
- Inadequate farmer groups,
- Weak climate-resilient agricultural practices.

Positive aspects include reasonably good veterinary services, vaccination programmes, artificial insemination, nearby agricultural markets, and deworming practices. Overall, the farming sector remains a moderate pillar of model village development and requires substantial policy intervention.

Table 4.3 Average Score of Farming Indicator

Sl.	Indicators	Average Score						
		Raipur	Nurpur	Kankutia & Kartickdanga	Halsidanga	Srichandrapur	Kamarpara	All
1	Crop rotation	4.00	2.00	5.50	6.50	4.00	3.00	4.17
2	Intercropping	4.00	2.00	4.00	6.00	4.00	3.00	3.83
3	Mixed farming	3.00	2.00	5.00	6.00	4.00	5.00	4.17
4	Integrated Pest Management (IPM)	4.00	2.00	5.00	5.00	4.00	3.00	3.83
5	Organic pesticide usage	4.00	2.00	5.00	5.00	5.00	4.00	4.17
6	Green manuring	4.00	2.00	6.00	6.00	5.00	4.00	4.50
7	Usage of farm implements	7.00	5.00	8.00	8.00	8.00	7.00	7.17
8	Electric pump sets or motors	5.00	3.00	5.00	8.00	8.00	5.00	5.67
9	Availability of irrigation water and modern techniques	5.00	3.00	5.00	8.00	4.00	3.50	4.75
10	Soil Health	7.00	5.00	8.00	8.00	7.00	6.50	6.92
11	Organic Farming Practices	0.00	0.00	1.00	3.00	2.00	0.00	1.00
12	Seed bank	0.00	0.00	0.00	2.00	0.00	0.00	0.33
13	Storage facilities	7.00	6.00	7.00	7.50	7.00	6.50	6.83
14	Custom hiring centre	7.00	6.00	8.00	8.00	7.00	5.00	6.83
15	Fair price shops	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	Crop Diversification	4.00	2.00	6.00	7.00	3.00	3.00	4.17
17	Water Harvesting Structure	3.00	2.00	7.00	4.00	3.00	4.00	3.83
18	Natural Farming Practices	2.00	1.00	3.00	3.00	1.00	1.00	1.83

19	Pucca sheds for animals	6.00	6.00	8.00	7.00	7.00	6.00	6.67
20	Practice of Artificial Insemination (AI)	8.00	6.00	8.00	8.00	8.00	8.00	7.67
21	Practice of deworming	9.00	9.00	9.00	9.00	9.00	9.00	9.00
22	Vaccination	8.00	8.00	9.00	9.00	9.00	8.00	8.50
23	Balanced feeding	6.00	5.00	6.00	8.00	8.00	8.00	6.83
24	Fodder production	6.00	4.00	6.00	6.00	5.00	7.00	5.67
25	Backyard poultry/apiary/fishery	6.00	9.00	5.00	5.00	4.00	6.00	5.83
26	Veterinary health centre and services	7.00	8.00	8.00	8.00	8.00	8.00	7.83
27	Nearest market for marketing farm produce	6.00	6.00	7.00	6.50	6.00	5.00	6.08
28	Use of improved inputs	4.00	3.00	7.00	8.00	7.00	6.00	5.83
29	Knowledge of farming schemes	6.50	4.50	8.00	7.50	7.00	7.00	6.75
30	Processing centre	5.00	2.00	4.00	0.00	0.00	0.00	1.83
31	Visit by agriculture personnel	3.00	3.00	4.00	5.00	2.00	4.00	3.50
32	AI facilities and services	0.00	1.00	2.50	0.00	0.00	0.00	0.58
33	Farmer Interest Groups (FIGs)/Farmers' club	0.00	0.00	2.00	0.00	0.00	0.00	0.33
34	FPO	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	Climate-resilient crops adoption	2.00	2.00	3.50	4.00	2.00	1.00	2.42
Overall Farming Indicator		4.36	3.47	5.30	5.49	4.51	4.19	4.55

Source: FGD with Stakeholders

Social Indicator

From Table 4.4, the social indicator achieved an overall score of 7.73, indicating relatively strong social development. Raipur recorded the highest score (8.75), followed by Halsidanga (8.00). The villages demonstrated excellent communal harmony, a low incidence of conflict, active cultural participation, a low prevalence of untouchability, and relatively high gender awareness. Nevertheless, certain issues, such as early marriage, alcohol consumption, and lower female participation in entrepreneurship, continue to affect some villages, particularly Nurpur. Overall, social capital appears considerably stronger than economic and agricultural development.

Table 4.4 Average Score of Social Indicator

Sl.	Indicators	Average Score						
		Raipur	Nurpur	Kankutia & Kartickdanga	Halsidanga	Srichandrapur	Kamarpara	All
1	Female marriage age	10.00	5.00	6.00	7.00	4.00	6.50	6.42
2	Incidents of clashes in the village	10.00	9.00	8.00	10.00	10.00	8.00	9.17
3	Female participation, literacy, and entrepreneurship	7.00	5.00	6.00	8.00	6.00	7.00	6.50
4	Consumption of alcohol and tobacco	7.00	3.00	6.50	7.50	7.00	5.00	6.00
5	Prevalence of purdah system	9.00	8.00	8.00	7.00	9.00	9.00	8.33
6	Communal conflict	10.00	8.00	9.00	9.00	10.00	10.00	9.33
7	Sex discrimination	7.00	5.00	8.00	9.00	9.00	9.00	7.83
8	Prevalence of dowry system	9.00	9.00	8.00	6.50	6.00	7.00	7.58
9	Prevalence of untouchability	8.50	7.00	9.00	7.50	7.00	9.00	8.00
10	Cultural participation	10.00	8.00	7.00	8.50	8.00	7.00	8.08
Overall Social Indicator		8.75	6.70	7.55	8.00	7.60	7.75	7.73

Source: FGD with Stakeholders

Environmental Indicators

Environmental sustainability remains another weak component, with an overall average score of only 3.08. The assessment indicates poor adoption of renewable energy technologies, inadequate waste segregation systems, limited rainwater harvesting, insufficient climate awareness programmes, and poor forest coverage. Only cremation practices and low industrial emission sources achieved relatively high scores. The results suggest that environmental management has not yet become an integral component of village development planning.

Table 4.5 Average Score of Environmental Indicator

Sl.	Sub-Indicators	Average Score						
		Raipur	Nurpur	Kankutia & Kartickdanga	Halsidanga	Srichandrapur	Kamarpara	All
1	Renewable energy sources (solar/biogas)	2.00	2.00	3.50	2.00	0.00	2.00	1.92
2	Pollution-free village pond	5.00	3.00	5.00	5.00	5.00	4.00	4.50
3	Forest coverage	4.00	0.00	2.00	0.00	0.00	0.00	1.00
4	Community grazing land	4.00	2.00	2.50	3.00	2.00	0.00	2.25
5	Use of biodegradable materials	5.00	3.00	2.00	3.00	2.00	3.50	3.08
6	Systematic waste management	1.00	1.00	1.50	6.00	6.50	5.00	3.50
7	Separate dustbin for degradable and non-degradable wasteages	2.00	0.00	1.50	1.00	1.00	1.50	1.17
8	Cremation Practices	7.00	6.00	8.00	8.00	8.00	9.00	7.67
9	Rainwater Harvesting	0.00	0.00	4.50	0.00	0.00	0.00	0.75
10	Disaster Preparedness activities	2.00	1.00	1.00	7.00	7.00	2.00	3.33
11	community awareness programmes on climate change	3.00	2.00	2.00	3.00	3.00	2.00	2.50
12	Emission Sources	9.00	8.00	8.00	8.00	8.00	8.00	8.17
Overall Social Indicator		3.67	3.67	2.33	3.46	3.83	3.54	3.08

Source: FGD with Stakeholders

The performance assessment of the six villages reveals distinct strengths and weaknesses across the five indicators of the Model Village Potential Index. Infrastructure indicators

consistently show high performance across all villages, reflecting strong connectivity, reliable electricity, safe drinking water, and communication facilities that form the backbone of rural development. In contrast, the economic and social indicators demonstrate moderate performance, suggesting that while financial inclusion, employment opportunities, and community participation are present, they remain balanced but require further strengthening to achieve sustainable growth. The most critical gaps are observed in the farming and environmental indicators, which record low performance. This highlights the urgent need for interventions in agricultural modernization, the adoption of climate-resilient practices, and ecological sustainability measures. Without targeted improvements in these areas, the long-term resilience and productivity of the villages will remain constrained, despite their infrastructural and social progress.

4.2.4 Weightage (w_i) Assignment

To reflect the relative importance of each indicator, weights are assigned following Bhattacharyya and Ponnusamy (2017):

- Infrastructure: 24%
- Economic: 21%
- Farming: 25%
- Social: 16%
- Environmental: 14%

4.2.5 Weighted Score Calculation

After assigning the weight for each indicator, the weighted score for each indicator is derived using the following formula:

$$\sum_{j=1}^5 W_j = \sum_{j=1}^5 A_j \times w_j$$

Where:

W_j = Weighted score of indicators j

A_j = Average score of the indicator j

w_j = Weightage of indicator j

4.2.6 Calculation of MVPI

The MVPI value for each village is then obtained by summing all weighted scores:

$$MVPI = \sum_{j=1}^5 W_j$$

4.2.7 Potentiality Assessment

Table 4.6 Model Village Potential Index

Model Village Potential Index (MVPI)							
Villages	Parameters	Infrastructural Indicator	Economic Indicators	Farming Indicator	Social Indicators	Environmental Indicators	MVPI
Raipur	Average Score	7.71	5.69	4.36	8.75	3.67	60.47
	Weighted Score	18.49	11.95	10.89	14.00	5.13	
Nurpur	Average Score	7.85	4.54	3.47	6.70	2.33	51.04
	Weighted Score	18.85	9.53	8.68	10.72	3.27	
Kankutia & Kamarpara	Average Score	7.12	5.29	5.30	7.55	3.46	58.36
	Weighted Score	17.08	11.11	13.25	12.08	4.84	
Halsidanga	Average Score	7.32	6.23	5.49	8.00	3.83	62.54
	Weighted Score	17.58	13.08	13.71	12.80	5.37	
Srichandrapur	Average Score	6.97	5.62	4.51	7.60	3.54	56.93
	Weighted Score	16.73	11.79	11.29	12.16	4.96	
Kamarpara	Average Score	6.44	5.54	4.19	7.75	3.08	54.27
	Weighted Score	15.46	11.63	10.46	12.40	4.32	
All	Average Score	7.24	5.48	4.55	7.73	3.32	57.27
	Weighted Score	17.36	11.52	11.38	12.36	4.65	

Source: Author's calculation from the village-level data

Table 4.6 of the MVPI analysis provides a comprehensive and layered understanding of developmental strengths and weaknesses across the six villages studied. The results reveal clear variations in performance, with Halsidanga (62.54) and Raipur (60.47) emerging as relatively

strong performers. Their higher scores are largely driven by strong infrastructural indicators and cohesive social structures. Reliable electricity, safe drinking water, pucca road connectivity, and active community participation have created a supportive environment that enhances developmental potential. These villages demonstrate how physical infrastructure and social capital together can sustain growth and resilience, although the farming and environmental sectors need improvement.

Kankutia & Kamarpara (58.36) and Srichandrapur (56.93) occupy a middle position, reflecting moderate overall performance. Both villages benefit from balanced infrastructure and social indicators, yet their farming systems and environmental management remain underdeveloped. This suggests that while basic services and community participation are in place, agricultural modernization and ecological sustainability have not kept pace. Kamarpara (54.27) performs slightly lower, with weaker farming practices and environmental sustainability despite moderate social cohesion. Its challenges highlight the importance of integrating agricultural reforms with environmental safeguards to ensure balanced development.

The village Nurpur (51.04) lags behind among all the selected villages. Its weaker performance stems from underdeveloped farming systems and poor environmental indicators. Although Nurpur benefits from social capital through Self Help Groups and basic infrastructure, its agricultural base remains fragile. Limited crop diversification, irrigation modernization gaps, and poor adoption of climate-resilient practices constrain its developmental potential. Environmental indicators across Nurpur and other villages remain low, pointing to systemic vulnerabilities in waste management, renewable energy adoption, and disaster preparedness.

Looking across all six villages, infrastructure and social indicators consistently fall into the high-performance range, reflecting strong connectivity, communication facilities, and access to essential services. Economic indicators are moderate, suggesting balanced but improvable conditions in financial inclusion, employment opportunities, gender equity, and cultural participation. Importantly, farming indicators fall into the moderate range, with scores between 3.47 and 5.49. This indicates that agricultural systems are functional but underdeveloped, requiring significant strengthening to reach higher levels of productivity and resilience in these villages. By contrast, environmental indicators remain low across the villages, underscoring systemic weaknesses in ecological sustainability and climate resilience.

4.3 Conclusion

Addressing the existing gaps enables the villages to advance from a foundation of infrastructural strength toward a more holistic and balanced model of development. The MVPI provides a structured quantitative framework for planning, guiding policymakers, researchers, and institutions toward inclusive, sustainable, and strategically directed rural transformation. It ensures that rural progress is measurable, comparable, and aligned with long-term developmental goals, positioning these villages to evolve into genuine models of rural advancement.

The assessment underscores the importance of targeted interventions in three interconnected domains. First, strengthening farming systems through crop diversification, modern irrigation techniques, soil health management, and farmer organizations can enhance agricultural productivity and resilience. Second, promoting ecological sustainability by introducing renewable energy solutions, systematic waste management, rainwater harvesting, and community awareness programmes will build stronger defences against climate change and environmental degradation. Third, advancing livelihood diversification through microenterprises, livestock development, and skill-based employment opportunities can reduce dependence on traditional farming, broaden income sources, and strengthen economic stability.

Together, these interventions have the potential to transform moderate and low-performing indicators into high-performing ones. More importantly, they create a pathway for balanced, resilient, and sustainable development across all six villages, ensuring that infrastructural gains are complemented by agricultural modernization, ecological responsibility, and diversified livelihoods. This integrated approach positions the villages not merely as beneficiaries of development but as active participants in shaping a future that is inclusive, sustainable, and aligned with broader rural transformation goals.

Chapter - 5: Major Problems and Proposed Solutions

5.1 Introduction

Rural development in Birbhum district faces a number of structural and operational challenges that directly affect farming, fisheries, and market systems. The villages studied reveal recurring issues such as inefficient irrigation, weak market infrastructure, a shortage of fertilizers, and rising fallow land. These problems reduce productivity, limit income opportunities, and weaken the confidence of farmers in agriculture as a sustainable livelihood. At the same time, the lack of proper training, storage facilities, and modern technology further aggravates the situation.

This chapter identifies the major problems faced by different villages and outlines practical solutions that can be implemented to improve agricultural performance, strengthen market linkages, and enhance rural livelihoods. By documenting both the challenges and the corrective measures, the study provides a clear roadmap for addressing the barriers to growth and ensuring more inclusive and sustainable village development.

5.2 Key Problems and Solutions

5.2.1 Raipur

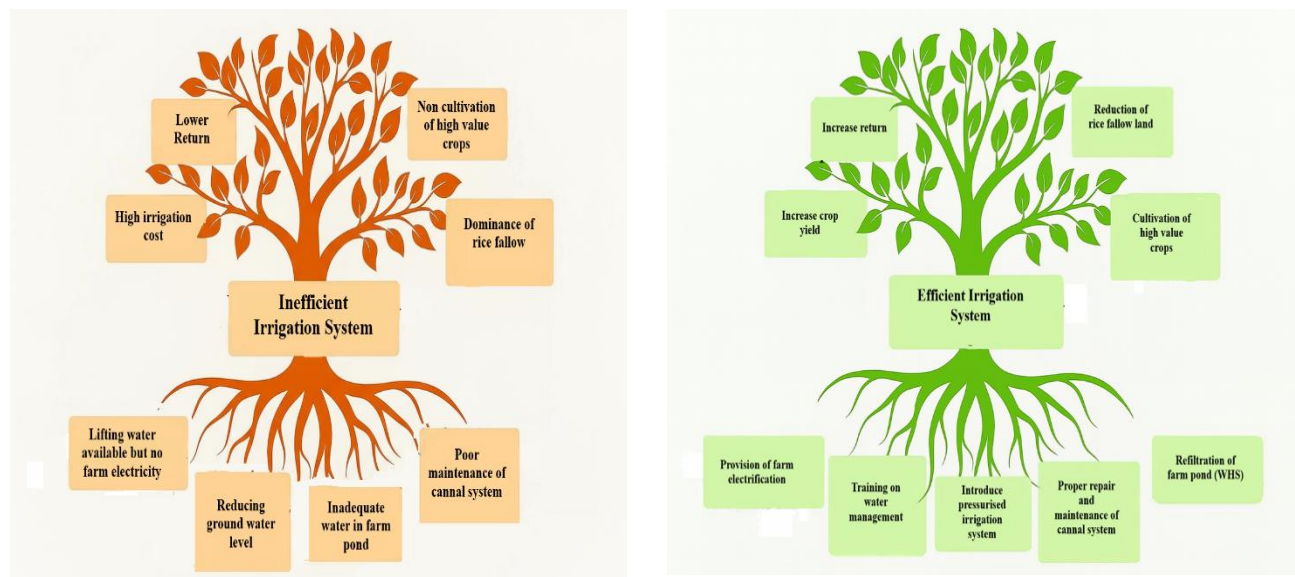
Problem 1: Inefficient Irrigation System

Farming in the villages suffers because the irrigation system does not work well. Groundwater is present under many fields, but farmers cannot use it. Most farms do not have electricity for pumps. Without power, submersible pumps cannot lift water from deep underground. At the same time, the canal network is in poor condition. Canals have cracks and leaks, and soil fills many sections. A lot of water is lost before it reaches the fields. Farm ponds also do not work as planned. They are shallow and not sealed properly, so stored rainwater slowly seeps away. When the dry season comes, ponds hold very little water. Over the years, the groundwater level has gone down. Wells must be dug deeper, and pumping water needs more energy and money. Because water is not reliable, farmers mostly grow rice in the monsoon and then keep land fallow. They cannot plant vegetables, potatoes, or other high-value crops in the dry months. Yields stay low, incomes remain small, and many families struggle to cover basic needs. In

this way, the inefficient irrigation system holds back both farm production and rural development.

Solutions 1: Improving the Irrigation System

Several simple but linked steps can improve irrigation. First, farms need reliable power. Extension of electric lines or the use of solar pumps can allow farmers to lift groundwater whenever needed. Second, canals must be repaired. Cracks should be sealed, weak sections lined, and silt removed on a regular schedule so that most of the water sent through canals reaches the fields. Third, farm ponds should be improved. Ponds can be deepened, and their bottoms lined with clay or plastic so that rainwater stays stored for the dry season. Fourth, farmers can adopt better irrigation methods. Drip systems and micro-sprinklers deliver water directly to plant roots and use much less water than flood irrigation. Fifth, farmers should receive training on simple water management. They need to know when to irrigate, how much water to apply, and which crops need more or less water. When water becomes reliable and is used carefully, farmers can grow crops in more than one season. They can shift from rice-fallow to rice-vegetable or rice-potato rotations. This raises yields, increases income, and makes better use of every hectare of land. Over time, these changes can strongly improve the village.



Problem tree and solution tree

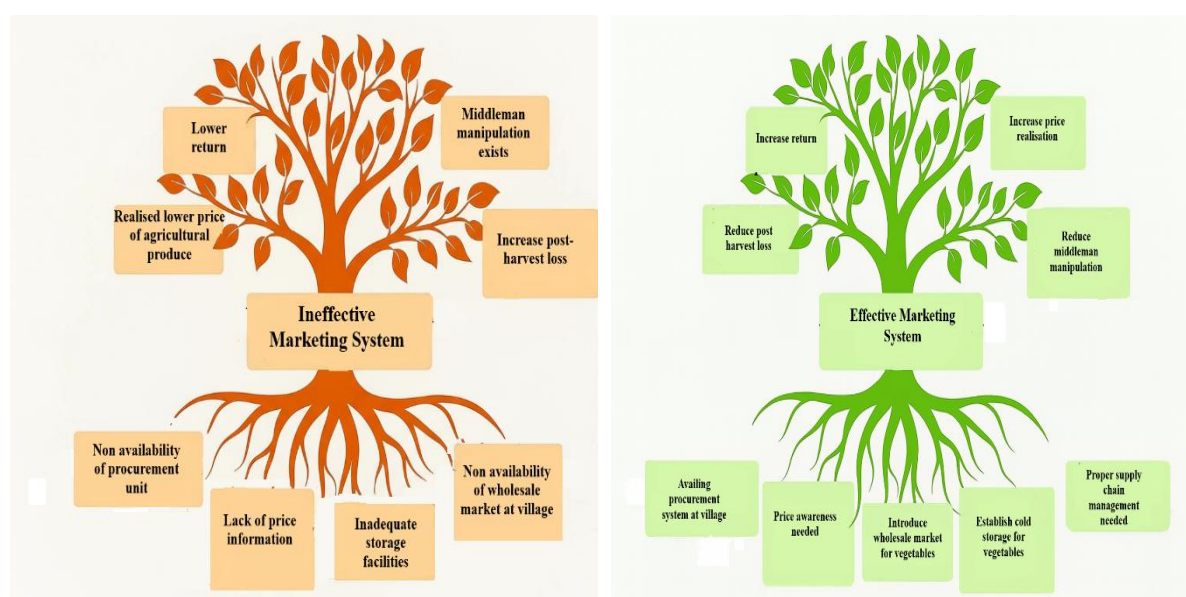
Problem 2: Ineffective Marketing of Agricultural Produce

Farmers in the villages face serious challenges in selling their crops. Even when they produce good harvests, they cannot get fair prices for their work. The marketing system does not work well for village farmers. The first issue is that middlemen exist between farmers and buyers. These middlemen buy crops from farmers at very low prices and then sell them to traders and retailers for much higher prices. Farmers receive only a small portion of the final price that consumers pay. Middlemen take most of the profit while farmers get very little return for their effort. Second, farmers do not know market prices. Without price information, they cannot negotiate with buyers. They accept whatever price is offered, even if it is unfair. Traders and middlemen take advantage of this lack of knowledge. Third, villages have no proper storage facilities. Farmers must sell crops immediately after harvest because they cannot store them safely. Spoilage and pest damage cause heavy losses. Forced immediate sales mean farmers sell when prices are lowest, right after harvest when supply is highest. Fourth, there is no wholesale market at the village level. Farmers must travel far to reach markets in towns. This takes time and money. Many small farmers cannot afford this journey. Fifth, there is no cold storage for vegetables and perishable crops. Vegetables rot quickly in hot weather. Farmers lose products and money before they can sell them.

Solutions 2: Effective Marketing System

Several practical steps can improve how farmers sell their produce and get better prices. First, a procurement system at the village level can help. The government or cooperatives can buy crops directly from farmers at fair prices. This removes middlemen and allows farmers to receive more money. A village procurement unit also provides storage space for collected produce. Second, farmers need price information. Mobile phones and radio broadcasts can share current market prices daily. When farmers know prices, they can make better selling decisions and negotiate fairly with buyers. Third, proper storage facilities must be built in villages. Simple storage sheds can protect crops from rain, sun, and pests. Better storage reduces post-harvest losses significantly. Farmers can then wait for better prices instead of selling immediately. Fourth, cold storage facilities for vegetables are important. A cold store in the village keeps vegetables fresh for longer periods. Farmers can store vegetables and sell them when prices are higher, not when supply is maximum. Fifth, a wholesale market should be established at the village or nearby location. This saves farmers time and money on transportation. Farmers can sell larger quantities to wholesalers directly without traveling far.

Sixth, farmers should form groups and cooperatives. When farmers work together, they have more power to negotiate better prices. Groups can collectively access storage facilities and markets. Cooperation also reduces individual costs. Seventh, supply chain management must improve. Better roads, transport facilities, and organized trading help move products quickly to markets while maintaining quality. When these solutions work together, farmers get fair prices, earn better income, and feel encouraged to invest more in farming.



Problem tree and solution tree

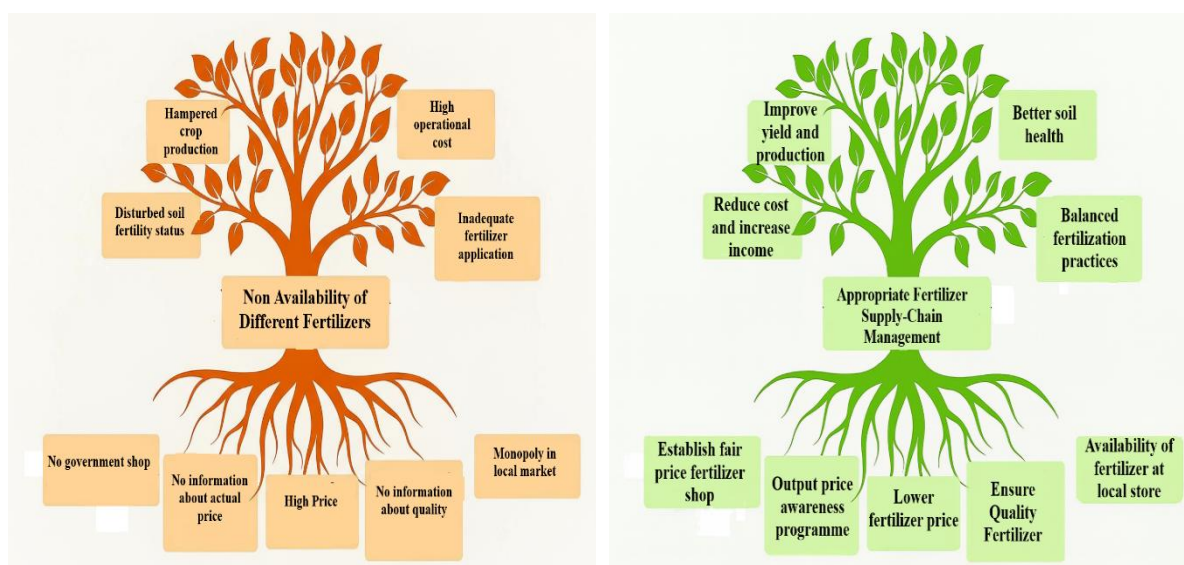
Problem 3: Non-Availability of Different Fertilizers

Farmers face serious problems because different fertilizers are not easily available in the local market. This shortage affects crop production and increases farming costs. Many farmers do not get the right fertilizer at the right time, so they use less than required or apply it late. As a result, crop growth becomes weak and yield drops. Another major issue is the high price of fertilizers. Since there is no government shop in many villages, farmers have to buy from private traders who often charge more. Local market monopoly makes the situation worse. A few sellers control the supply, so farmers have no choice but to pay high prices. Farmers also do not receive proper information about actual fertilizer prices and quality. Because of this, they cannot identify fair rates or good products. Inadequate fertilizer application also disturbs soil fertility over time. This reduces land productivity and harms long-term soil health. All these problems together lead to lower crop production, higher operational costs, and reduced income. Farmers are unable to invest properly in farming, and their livelihood becomes more

difficult. The lack of affordable and quality fertilizers is therefore a major barrier to agricultural development.

Solutions 3: Appropriate Fertilizer Supply-Chain Management

Several steps can solve the fertilizer problem and help farmers improve production. First, fair-price fertilizer shops should be established in local areas. If farmers can buy fertilizers nearby at reasonable rates, they will not depend on middlemen or private monopoly sellers. Second, fertilizer should be made available in local stores on time. Timely supply is very important because farmers need fertilizers during specific crop stages. Third, the government should organize output price awareness programmes. When farmers know crop prices in advance, they can plan input use better and avoid unnecessary spending. Fourth, fertilizer prices should be lowered through subsidies and better supply management. This will reduce cultivation costs and increase farmer income. Fifth, the quality of fertilizer must be ensured. Poor-quality fertilizers harm crops and waste money, so strict quality checks are necessary. Sixth, balanced fertilization practices should be promoted. Farmers should use the right quantity of different nutrients instead of depending on one type of fertilizer. Seventh, proper fertilizer supply-chain management must be improved from production to village-level distribution. This will reduce shortages and delays. Finally, better soil health and crop yield can be achieved through scientific fertilizer use. These measures will lower costs, improve production, and support sustainable farming.



Problem tree and solution tree

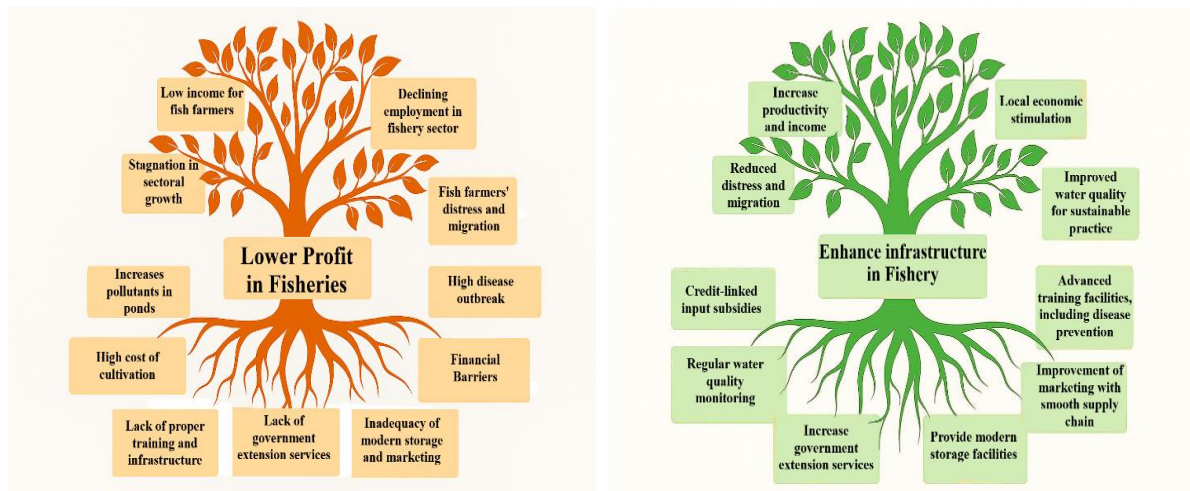
5.2.2 Nurpur

Problem 1: Lower Profit in Fisheries

Fish farmers in the village face low earnings from fish farming. Their production cost is high because they spend money on feed, fish seed, medicines, labour, and pond maintenance. At the same time, they often do not receive a good selling price for their produce. This reduces overall profit and makes fish farming less attractive. Another major problem is the lack of proper training and extension support. Many farmers do not know modern fish farming methods, disease control, or scientific pond management. Poor storage and marketing facilities also create losses, because fish must be sold quickly and often at low prices. In addition, polluted pond water and frequent disease outbreaks reduce fish production. Financial barriers make it difficult for farmers to invest in better inputs or improve their farms. The absence of strong government support, infrastructure, and market systems further weakens the sector. As a result, fish farmers earn less, employment in fisheries declines, and some farmers are forced to migrate for other work. Lower profit in fisheries is therefore a serious obstacle to rural income growth and sustainable development.

Solution 1: Enhancing Infrastructure in Fishery

Several measures can improve fish farming and increase farmers' income. First, regular water quality monitoring should be introduced to keep ponds healthy and reduce disease problems. Second, farmers need better training and extension services on fish rearing, feeding, pond management, and disease prevention. This will improve production efficiency. Third, modern storage facilities should be developed so fish can be preserved properly and sold at better prices. Fourth, the marketing system needs to be strengthened through a smooth supply chain and better access to markets. Fifth, credit-linked input subsidies can help farmers buy quality inputs without much financial pressure. Sixth, government support for fishery infrastructure should be increased, including technical guidance and local facilities. Cleaner water, improved management, and scientific practices will raise productivity. These steps can reduce losses, improve profit margins, create stable livelihoods, and support sustainable growth in the fishery sector.



Problem tree and solution tree

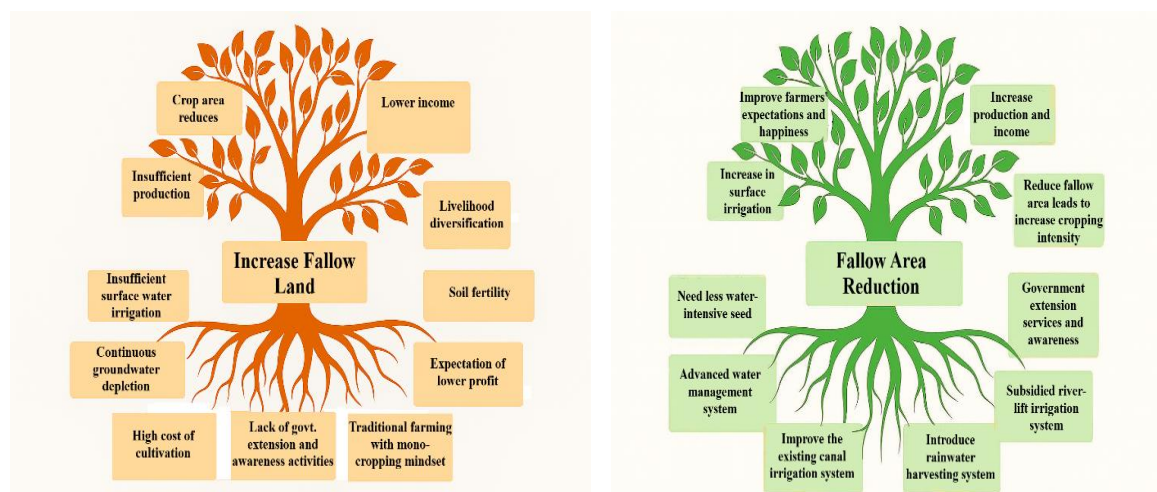
Problem 2: Increasing Fallow Land

The growth of fallow land is a serious issue in rural farming areas. Many fields remain uncultivated because farmers do not have enough irrigation support, and groundwater keeps declining. In several places, surface water is also insufficient, so farmers cannot grow crops regularly. As a result, crop area decreases, and production falls. High cultivation costs make the situation worse. Farmers often feel that investing in land will not give enough return, so they leave land idle. Poor soil fertility and low expected profit also reduce their interest in cultivation. Traditional farming habits and a mono-cropping mindset further limit proper land use. In addition, the lack of government extension and awareness programmes means farmers do not get enough guidance on better practices. These problems reduce income and force some families to diversify their livelihoods outside agriculture. The rise in fallow land lowers cropping intensity, weakens farm productivity, and affects rural economic growth. If this trend continues, more land will stay unused and agricultural output will decline further. Therefore, increasing fallow land is not only a land-use problem but also a major threat to farm income and sustainable agriculture.

Solution 2: Fallow Area Reduction

Fallow land can be reduced through better water management and stronger support for farmers. First, surface water irrigation should be expanded, and existing canal systems must be improved so water reaches fields more reliably. Second, subsidized river-lift irrigation and rainwater harvesting can help farmers access water in dry periods. Third, advanced water management systems should be promoted to reduce wastage and use water more efficiently.

Farmers should also be encouraged to use less water-intensive crops and improved seed varieties. This can make cultivation possible even in areas with limited irrigation. Government extension services must provide regular awareness programmes on land use, crop planning, and modern farming techniques. In addition, support for cropping intensity can help farmers grow more than one crop on the same land. These steps will increase production, raise income, and improve farmers' confidence in farming. Better irrigation, awareness, and technology can gradually bring fallow land back under cultivation and strengthen rural livelihoods.



Problem tree and solution tree

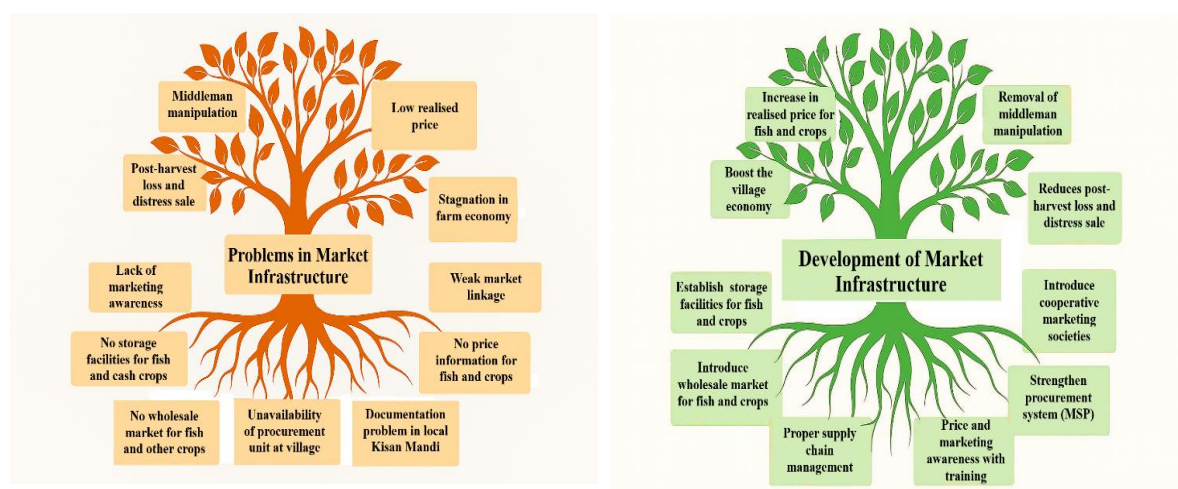
Problem 3: Problem in Market Infrastructure

The villages face serious problems with market infrastructure that directly hurt farmers and their income. The biggest issue is the presence of middlemen who control the buying and selling of crops. These middlemen purchase fish and crops from farmers at very low prices and then sell them at much higher rates in bigger markets. Farmers receive only a small portion of what consumers eventually pay. Another major problem is the complete lack of storage facilities for fish and cash crops. Without proper storage, farmers must sell their produce immediately after harvest, even when prices are very low. This forced immediate sale causes farmers to suffer losses and accept unfair prices. Post-harvest losses are very high because crops spoil quickly without protection from weather and pests. There is also no wholesale market for fish and other crops near the villages. Farmers must travel to distant markets, which costs them time and money. Additionally, farmers have no price information about fish and crops. Without knowing the real market prices, they cannot negotiate properly with buyers and are easily cheated. Documentation problems also exist in local Kisan Mandi records. The procurement system at the village level is not always available, making it difficult for farmers

to access fair trading opportunities. All these problems combine to keep farm incomes low and prevent economic growth in rural areas.

Solutions 3: Development of Market Infrastructure

Several practical solutions can help create a better market system that benefits farmers. First, the government should establish proper storage facilities for fish and cash crops at the village level. These facilities will prevent post-harvest losses and allow farmers to store their produce until prices improve. Second, a wholesale market should be introduced for fish and crops near the villages. This allows farmers to sell directly to wholesalers without traveling far, saving them time and money. A local wholesale market also removes middlemen from the trading chain, meaning farmers get more of the final price. Third, farmers need access to price information for fish and crops. This can be shared through mobile messages, radio broadcasts, or notice boards. When farmers know current prices, they can negotiate better and avoid being cheated by traders. Fourth, cooperative marketing societies should be introduced to help farmers sell together. When farmers work in groups, they have more power to negotiate fair prices. Cooperatives can also handle storage, transportation, and marketing together, reducing individual costs. Fifth, the procurement system at the village level should be strengthened and made always available. A reliable village procurement unit buys directly from farmers at fair prices, removing middlemen and their unfair profits. Sixth, proper documentation should be maintained in local Kisan Mandi records to ensure transparency and fairness in all transactions. These solutions together will boost village economies, increase farmer income, and reduce the problems caused by poor market infrastructure.



Problem tree and solution tree

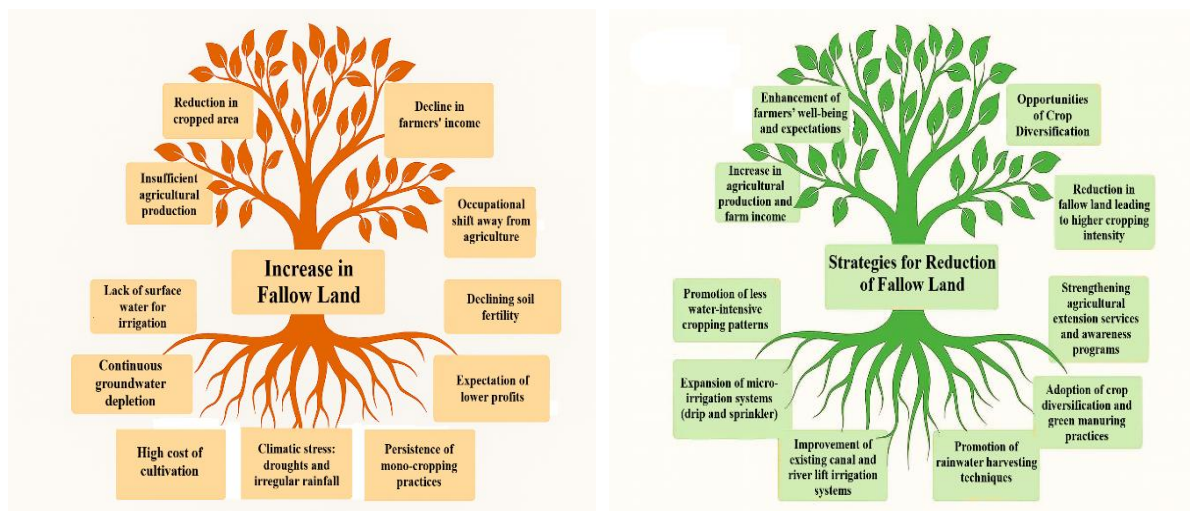
5.2.3 Kankutia & Kartickdanga

Problem 1: Increase in Fallow Land

The increase in fallow land is a serious concern for rural agriculture. Many plots remain uncultivated because farmers cannot manage the rising cost of cultivation and do not get enough irrigation support. Continuous groundwater depletion and a lack of surface water make farming difficult, especially during dry periods. Climate stress, such as irregular rainfall and drought, further discourages cultivation. Farmers also face low soil fertility and poor agricultural output, which reduces their confidence in using land every season. As a result, cropped area declines and agricultural production falls. In many villages, farmers expect lower profits from cultivation and therefore shift to other occupations. The persistence of mono-cropping practices also limits land use and reduces the scope for intensive farming. These factors together lead to lower farm income and less productive use of land. The growth of fallow land weakens rural livelihoods, reduces agricultural employment, and lowers overall economic activity in farming areas. If this trend continues, more land will remain unused and food production will suffer. Therefore, the rise in fallow land is both an economic and environmental challenge that needs urgent attention.

Solution 1: Strategies for Reduction of Fallow Land

Fallow land can be reduced through better irrigation, improved farming practices, and stronger extension support. First, micro-irrigation systems such as drip and sprinkler methods should be expanded so farmers can save water and cultivate land more efficiently. Second, existing canal and river-lift irrigation systems need proper maintenance and expansion to ensure more reliable water supply. Third, rainwater harvesting should be promoted to store water for dry periods. Fourth, farmers should be encouraged to adopt less water-intensive cropping patterns and diversify crops instead of relying on mono-cropping. This will make farming more flexible and profitable. Fifth, green manuring and other soil-improving practices can help restore fertility and increase yield. Sixth, agricultural extension services and awareness programmes should be strengthened so farmers receive timely advice on land use, irrigation, and crop planning. These measures will reduce fallow land, increase cropping intensity, and raise agricultural production. Better water management and improved farming systems will also improve farmers' income and overall well-being.



Problem tree and solution tree

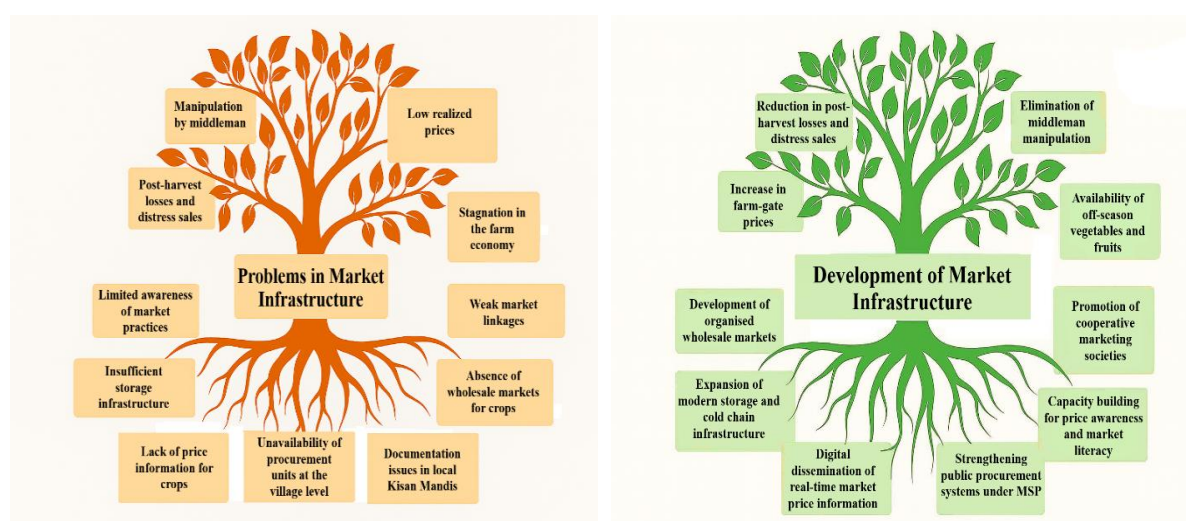
Problem 2: Problems in Market Infrastructure

Farmers in the villages face many problems in selling their crops at fair prices. The biggest issue is the control of middlemen. These middlemen buy crops from farmers at very low prices and sell them later at much higher rates. Because of this, farmers receive only a small share of the final market value. Another major problem is the lack of storage facilities. Farmers cannot keep their crops safely after harvest, so they are forced to sell quickly. This often leads to distress sales at low prices. Many crops also get damaged or spoil before they can be sold, causing post-harvest losses. Farmers have very little information about market prices. Without proper price knowledge, they cannot negotiate well with buyers. There are also no wholesale markets nearby, so farmers must travel long distances to sell their produce. This increases transport cost and reduces profit. Village-level procurement units are also absent or weak. Farmers do not have a proper place to sell directly at fair prices. In addition, local Kisan Mandi records often have documentation problems, which create more difficulty in trade. Poor market linkages and limited awareness of market practices make the situation worse. Together, these problems keep farm incomes low and stop the growth of the rural economy.

Solutions 2: Development of Market Infrastructure

Improving market infrastructure can greatly help farmers earn better prices. First, modern storage and cold chain facilities should be expanded in villages. These facilities will keep crops fresh for longer and reduce post-harvest losses. Farmers will not need to sell immediately after harvest. Second, organized wholesale markets should be developed near the villages. This will save farmers time and transport costs. It will also reduce the role of middlemen, allowing

farmers to sell more directly to buyers and earn better farm-gate prices. Third, real-time market price information should be shared through mobile phones, radio, and other digital tools. When farmers know the current prices, they can make better selling decisions and avoid unfair deals. Fourth, cooperative marketing societies should be promoted. These groups can help farmers sell together, bargain better, and share storage and transport costs. Fifth, village-level procurement systems under MSP should be strengthened. If farmers can sell directly to government buyers, they will get fair and stable prices. Sixth, training programmes should improve farmers' market awareness and literacy. They should learn how to read prices, understand market demand.



Problem tree and solution tree

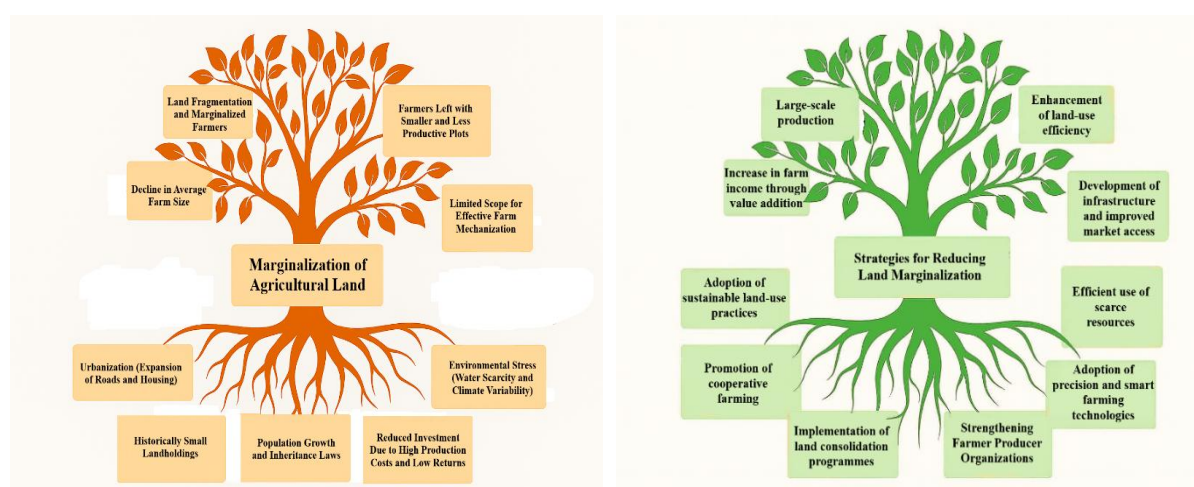
Problem 3: Marginalization of Agricultural Land

Marginalization of agricultural land is a growing concern in rural areas. Many farmers now own smaller and less productive plots because of land fragmentation over generations. As families grow and land is divided among heirs, the average farm size keeps falling. This leaves farmers with limited space for efficient cultivation and reduces overall productivity. Urban expansion, especially for roads and housing, is also taking away fertile farmland. At the same time, environmental stress such as water scarcity and climate variability makes small plots even less reliable for farming. In many cases, farmers do not invest much in these lands because production costs are high and returns are low. This further weakens the productivity of marginal land. Small holdings also create problems for mechanization, since machines are difficult to use on tiny and scattered plots. As a result, farmers face low income, limited market power,

and reduced opportunities for agricultural growth. Land marginalization therefore affects production, efficiency, and rural livelihoods in many ways.

Solution 3: Strategies for Reducing Land Marginalization

Land marginalization can be reduced through better planning, cooperation, and technology use. First, land consolidation programmes should be promoted so scattered plots can be managed more efficiently. This will help farmers use land in a more productive way. Second, cooperative farming should be encouraged, allowing small farmers to share resources, labour, and machinery. Third, precision and smart farming technologies should be adopted to improve output from limited land. Fourth, sustainable land-use practices can help protect soil health and increase long-term productivity. Fifth, stronger Farmer Producer Organizations should be supported so farmers can access markets, inputs, and services more easily. In addition, infrastructure development and better market access are needed to improve income opportunities. Efficient use of scarce resources, along with value addition, can make small farms more profitable. These measures will improve land-use efficiency, increase farm income, and support large-scale productive farming even in fragmented areas.



Problem tree and solution tree

5.2.4 Halsidanga

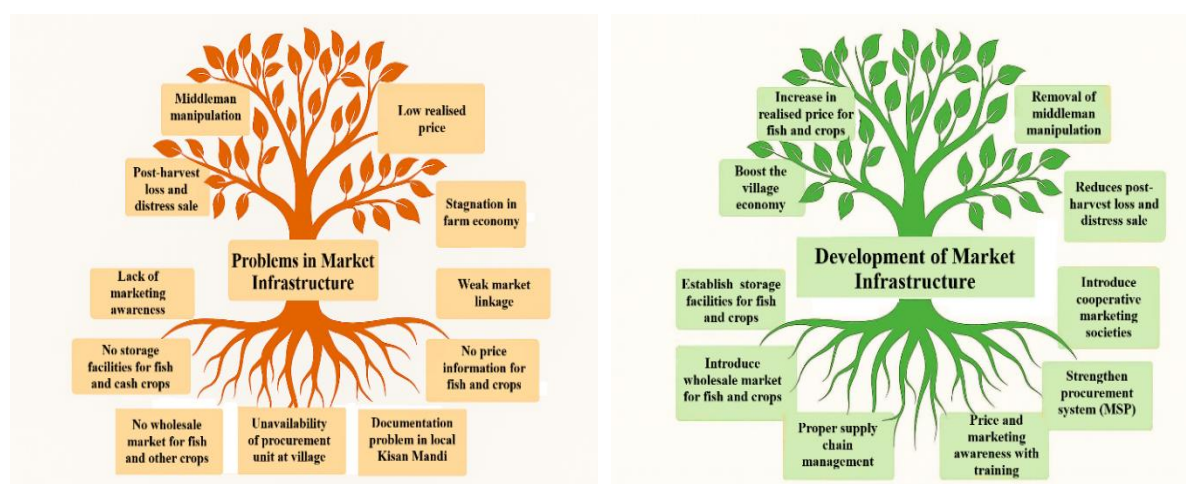
Problem 1: Problems in Market Infrastructure

Weak market infrastructure is a major barrier for farmers. In many villages, there are no proper procurement units, wholesale markets, or storage facilities for crops. Because of this, farmers are often forced to sell produce quickly at low prices. Lack of real-time price information also reduces their bargaining power and leaves them dependent on middlemen. Post-harvest losses

are high because modern storage and cold chain facilities are insufficient. Perishable crops spoil easily, leading to distress sales and income loss. Documentation problems in local kisan mandis and weak market linkages further make the system inefficient. Farmers also have limited awareness of market practices, so they cannot access better selling opportunities. These structural weaknesses cause low realized prices and discourage investment in farming. As a result, farm income remains unstable and the rural economy grows slowly. The absence of organized market support reduces efficiency in trade and limits opportunities for value realization. Poor market infrastructure therefore affects farmers, consumers, and the overall agricultural system.

Solution 1: Development of Market Infrastructure

Market infrastructure can be improved through stronger public support and better organization. First, organized wholesale markets should be developed so farmers can sell produce in a fair and efficient system. Second, modern storage and cold chain facilities must be expanded to reduce post-harvest losses and prevent distress sales. Third, village-level procurement units should be introduced to ensure farmers have local selling options. Fourth, digital platforms can be used to spread real-time market price information, helping farmers make better decisions. Fifth, cooperative marketing societies should be promoted so farmers can sell collectively and reduce dependence on middlemen. In addition, public procurement systems under MSP should be strengthened to improve price support. Capacity building on market awareness and literacy is also important. These measures will improve farm-gate prices, reduce manipulation, increase availability of off-season produce, and strengthen rural income. Better market infrastructure will create a more transparent, efficient, and farmer-friendly marketing system.



Problem tree and solution tree

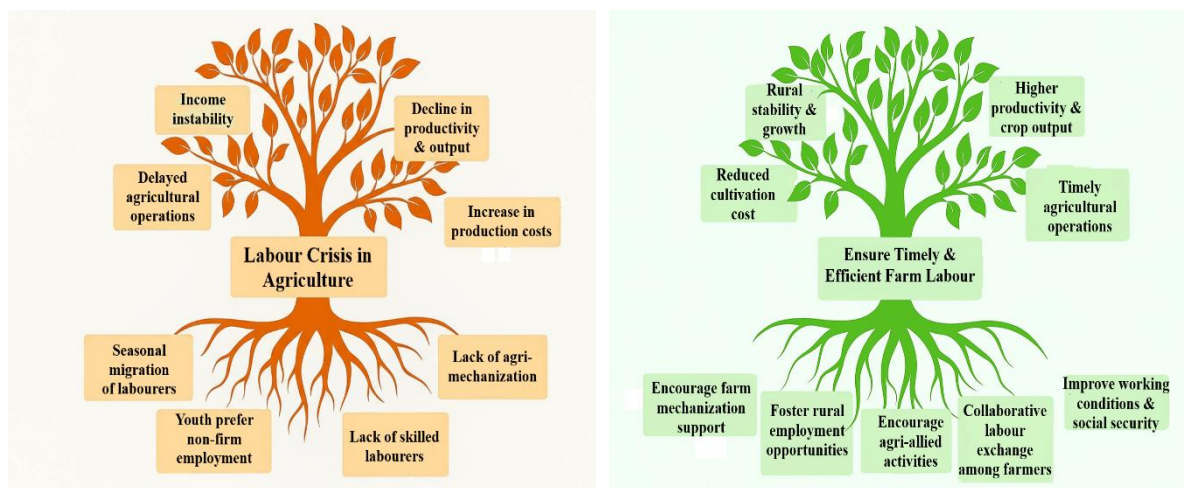
Problem 2: Labour Crisis in Agriculture

The agricultural labour crisis represents a multidimensional challenge that undermines both productivity and rural sustainability. At its core, the crisis is driven by income instability, which discourages workers from remaining in farm-based occupations. This instability is compounded by rising production costs and delayed agricultural operations, leading to a decline in overall productivity and output. Seasonal migration further disrupts labour availability, creating acute shortages during peak periods of cultivation and harvesting. The lack of adequate mechanization intensifies dependence on manual labour, while the absence of skilled workers reduces efficiency and quality in agricultural practices. Moreover, structural changes in rural employment patterns-particularly the preference of younger generations for non-farm opportunities-accelerate the erosion of the agricultural workforce. These dynamics collectively weaken the resilience of rural livelihoods, heighten vulnerability to external shocks, and threaten food security. Addressing this crisis requires a comprehensive policy framework that integrates income stabilization measures, investment in mechanization, skill development programmes, and incentives to retain youth in agriculture. Therefore, the problem of labour shortages in the village, is a major barrier to agricultural growth and farmer welfare.

Solutions 2: Ensure Timely & Efficient Farm Labour

Ensuring timely and efficient farm/agricultural labour availability is a cornerstone of agricultural sustainability and rural development. The framework rests on strengthening foundational supports such as mechanization, improved working conditions, and social security, while simultaneously fostering rural employment opportunities and encouraging agri-allied activities. Collaborative labour exchange among farmers can mitigate seasonal shortages, while skill development and mechanization support reduce dependence on unskilled manual work. These measures collectively enhance the resilience of the agricultural workforce. The outcomes are equally significant: timely agricultural operations prevent delays in sowing and harvesting, thereby safeguarding crop cycles; reduced cultivation costs improve farm profitability; and higher productivity contributes to food security and rural prosperity. Moreover, stable and efficient labour availability promotes rural stability and growth by curbing distress migration and ensuring that agriculture remains a viable livelihood option. Policy interventions must therefore integrate labour management strategies with broader rural development goals, emphasizing institutional support, targeted incentives, and inclusive social protection. By aligning labour efficiency with productivity gains and livelihood security,

agricultural systems can achieve both economic viability and social stability, ensuring that rural communities thrive in the face of evolving challenges. This holistic approach transforms labour management into a driver of sustainable agricultural growth.



Problem tree and solution tree

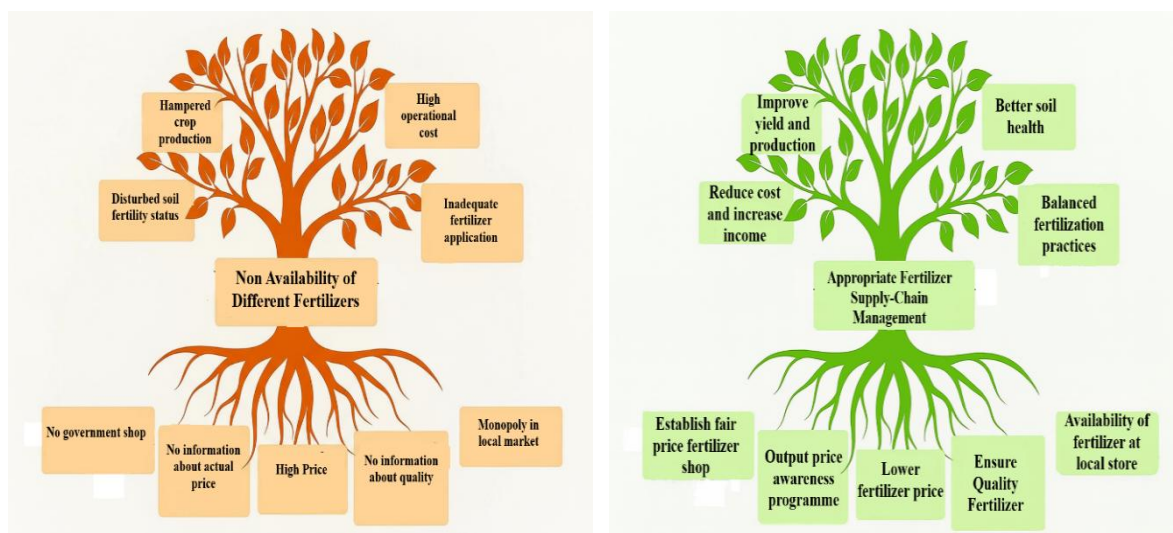
Problem 3: Non-Availability of Different Fertilizers

The non-availability of different fertilizers is a serious problem for farmers. In many villages, farmers cannot get fertilizers at the right time or in the required quantity. This creates delays in crop operations and hampers normal production. When fertilizers are scarce, farmers often use whatever is available, even if it is not suitable for the crop. As a result, soil fertility becomes unbalanced and crop growth is affected. High fertilizer prices also reduce farmers' ability to buy sufficient inputs. In some areas, there is no government shop, so farmers depend on local markets where monopoly practices raise prices. They also receive little information about the actual price and quality of fertilizers, which makes them vulnerable to exploitation. Because of inadequate fertilizer application, crop production declines and operational costs rise. Poor fertilizer access weakens soil health, lowers productivity, and reduces income. Over time, this problem increases farming uncertainty and makes cultivation less profitable and less sustainable for rural households.

Solution 3: Appropriate Fertilizer Supply-Chain Management

The fertilizer problem can be reduced through better supply-chain management and fair market regulation. First, fertilizer availability should be ensured at local stores so farmers can buy inputs easily and on time. Second, fair price fertilizer shops should be established to prevent overpricing and monopoly control. Third, proper quality control is necessary so farmers receive

genuine fertilizers with reliable performance. Fourth, awareness programmes should inform farmers about output prices, fertilizer use, and input quality. This can help them make better decisions. Fifth, fertilizer prices should be kept lower and more stable through policy support and monitoring. Balanced fertilization practices should also be promoted so soil health remains strong and crop yield improves. With better supply, fair pricing, and quality assurance, farmers can reduce cultivation costs and increase income. These measures will improve production efficiency and make agriculture more sustainable.



Problem tree and solution tree

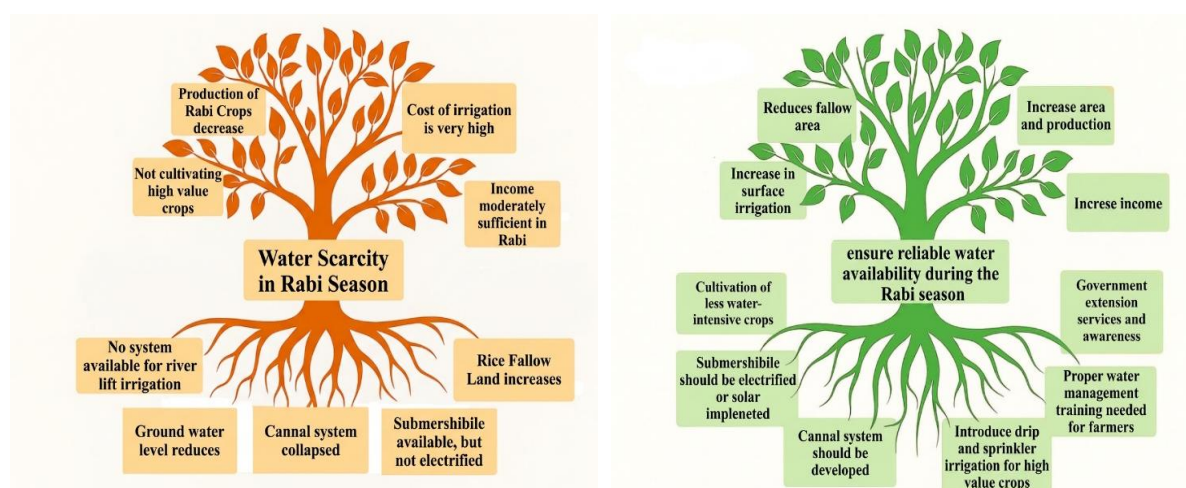
5.2.5 Srichandrapur

Problem 1: Water Scarcity in Rabi Season

Water scarcity during the Rabi season is a major challenge for farmers. In this period, irrigation demand is high, but available water is often not enough. Groundwater levels continue to decline, while many canal systems have collapsed or become ineffective. As a result, farmers cannot irrigate their fields properly. The absence of river-lift irrigation systems makes the situation worse. Although submersible pumps exist in some areas, many are not electrified, so they cannot be used effectively. Because of these limitations, farmers depend on limited water sources and are unable to grow crops at the right time. This shortage of water reduces Rabi crop production and discourages farmers from cultivating high-value crops. Income from Rabi farming remains only moderately sufficient, which lowers motivation for further investment. As water becomes more uncertain, rice fallow land also increases. Overall, water scarcity in the Rabi season reduces cropping area, lowers productivity, and weakens farm income.

Solution 1: Ensuring Reliable Water Availability in the Rabi Season

Water scarcity in the Rabi season can be reduced by improving irrigation systems and water management. First, surface irrigation should be expanded so more farmers can access water when needed. Second, canal systems must be repaired and developed to support regular water flow to farms. Third, electrification of submersible pumps or the use of solar power should be ensured so existing water sources can be used efficiently. Farmers should also be encouraged to adopt drip and sprinkler irrigation, especially for high-value crops, because these methods save water and improve productivity. Less water-intensive crops can be promoted in areas with limited water. Government extension services should provide regular training and awareness on efficient water use and crop planning. These measures will ensure reliable water availability during the Rabi season, reduce fallow land, increase cropped area, and improve production and income.



Problem tree and solution tree

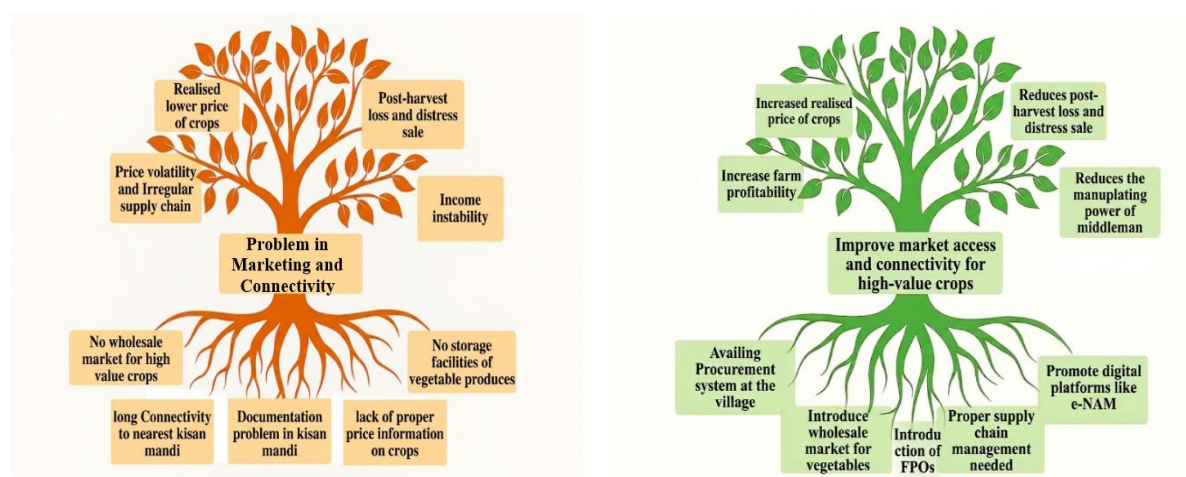
Problem 2: Problem in Marketing and Connectivity

Marketing and connectivity remain major challenges for farmers, especially for high-value crops. Many farmers do not receive a fair price for their produce because market systems are weak and price changes are frequent. They often sell crops at low rates due to the influence of middlemen and irregular supply chains. This reduces their income and makes farming less profitable. Another major issue is the lack of wholesale markets nearby. Farmers must travel long distances to sell vegetables and other perishable crops, which increases cost and time loss. Poor storage facilities also cause post-harvest losses and force distress sales. In addition, many farmers do not have proper price information, so they cannot decide the best time or place to

sell. Problems in documentation at local markets and weak connectivity with nearby kisan mandis add further difficulties. Because of these barriers, farmers face income instability and reduced bargaining power. Overall, poor marketing and weak connectivity limit farm earnings, increase losses, and reduce the attractiveness of high-value crop cultivation.

Solution 2: Improving Market Access and Connectivity

Marketing problems can be reduced by strengthening market access and farmer support systems. First, procurement facilities should be available at the village level so farmers can sell produce directly at fair prices. Second, wholesale markets for vegetables and other high-value crops should be developed near farming areas to reduce transport costs and losses. Third, better supply chain management is needed to ensure smooth movement of produce from farm to market. Fourth, Farmer Producer Organizations should be promoted so farmers can bargain collectively and reduce the control of middlemen. Fifth, digital platforms like e-NAM should be expanded to improve price transparency and direct marketing. Farmers should also receive regular price information and guidance through extension services. Better storage, documentation, and market connectivity will help reduce distress sales and post-harvest loss. These steps will increase realized prices, improve profitability, and create a more stable and efficient agricultural marketing system.



Problem tree and solution tree

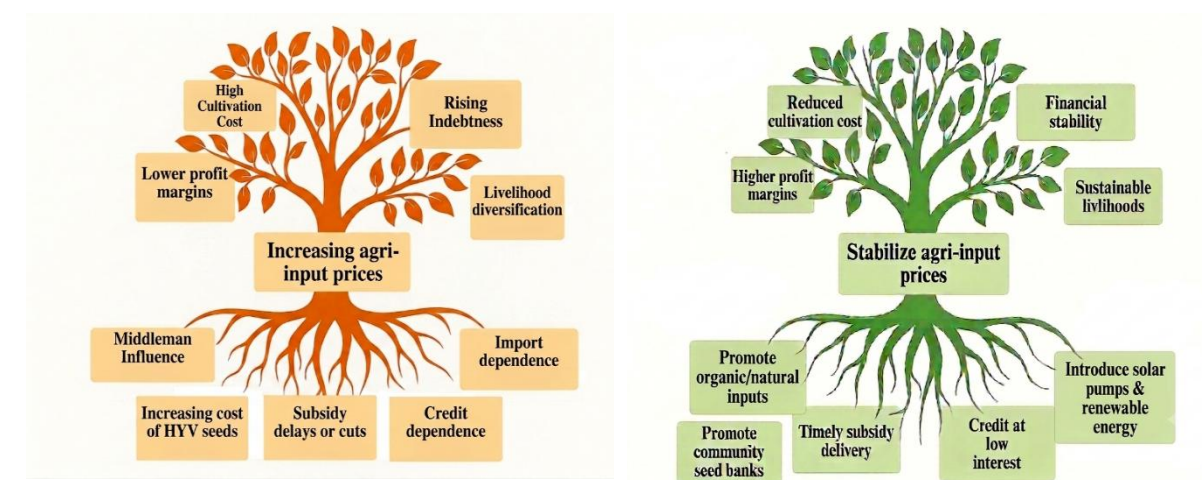
Problem 3: Increasing Agri-Input Prices

Rising prices of agricultural inputs have become a major burden for farmers. The cost of seeds, fertilizers, pesticides, and irrigation equipment keeps increasing, which raises the overall cost of cultivation. Many farmers, especially smallholders, cannot afford these inputs at the right

time and are forced to reduce their use. This often leads to lower productivity and weaker crop performance. The problem becomes worse because of high HYV seed prices, middleman influence, and import dependence. Farmers also face delays or cuts in subsidies, which increases financial pressure during the cropping season. Since many depend on credit to buy inputs, their debt burden continues to grow. As a result, farm profit margins remain low and income become unstable. In some cases, farmers are unable to invest in better practices and are pushed toward livelihood diversification outside agriculture. Increasing agri-input prices therefore reduce profitability, weaken farm sustainability, and create long-term financial stress for rural households.

Solution 3: Stabilizing Agri-Input Prices

Agri-input prices can be stabilized through a mix of cost-saving and supportive measures. First, organic and natural inputs such as compost, bio-fertilizers, and bio-pesticides should be promoted to reduce dependence on costly chemical inputs. Second, community seed banks can provide quality seeds at lower prices and improve seed availability. Third, subsidies must be delivered on time so farmers can buy inputs when needed. Fourth, access to low-interest credit can help farmers manage seasonal expenses without falling into heavy debt. Fifth, solar pumps and other renewable energy options should be introduced to lower irrigation costs. Better regulation of the input market can reduce middleman influence and unfair pricing. In addition, local production of seeds and inputs should be encouraged to reduce import dependence. These steps will help lower cultivation costs, improve profit margins, create financial stability, and support sustainable rural livelihoods.



Problem tree and solution tree

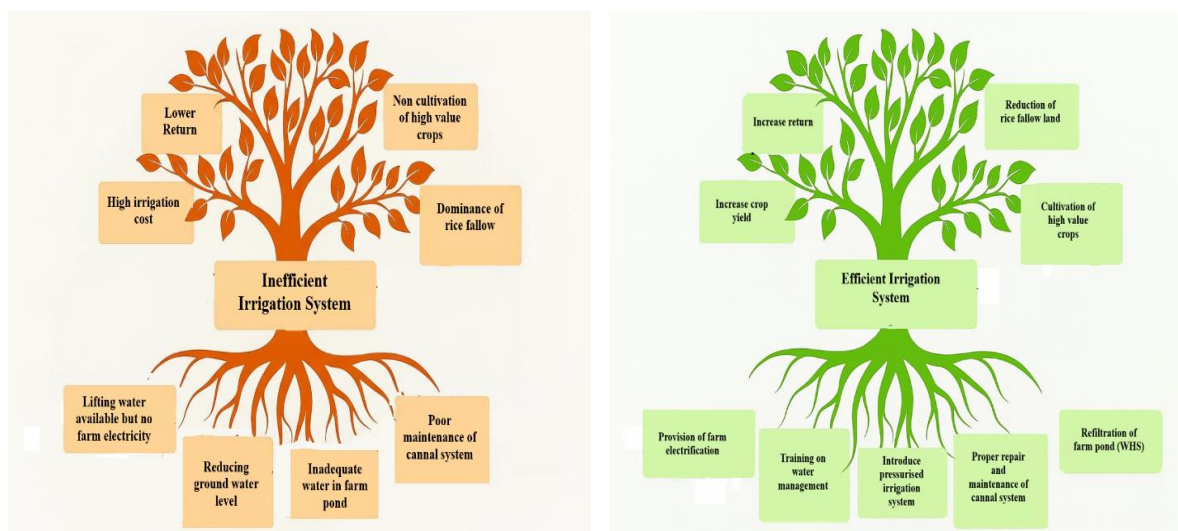
5.2.6 Kamarpara

Problem 1: Inefficient Irrigation System

Farmers in the villages face serious problems due to an inefficient irrigation system. Although water may be present in some places, farmers cannot use it properly due to poor electricity supply. In many areas, there is water available for lifting, but there is no farm electricity to run pumps. This makes irrigation difficult and expensive. Another major issue is the poor maintenance of canal systems. Canals are damaged, blocked, or not repaired in time, so water does not reach the fields properly. At the same time, groundwater levels are falling year after year because of continuous extraction. This makes irrigation even more difficult. Farmers also have inadequate water storage in farm ponds. When rainwater is available, it is not stored properly for later use. Because of this, they face water shortages during the dry season. Irrigation costs become high, and farmers get lower returns from their crops. Due to these problems, farmers cannot cultivate high-value crops and often keep land fallow. Rice fallow land remains dominant in many areas. All these issues reduce crop yield, increase costs, and lower farm income. The inefficient irrigation system is therefore a major barrier to agricultural growth and farmer welfare.

Solutions 1: Efficient Irrigation System

Several solutions can improve the irrigation system and help farmers grow more crops. First, farm electrification should be provided so that submersible pumps can run properly. If farmers get electricity at the right time, they can lift and use available water for irrigation. Second, water management training should be given to farmers. They should learn how to save water, when to irrigate, and how to use water efficiently. Third, a pressurised irrigation system should be introduced. Methods like drip and sprinkler irrigation use less water and help increase crop yield. Fourth, canals must be repaired and maintained regularly. A proper canal system will ensure water reaches the fields without loss. Fifth, farm ponds should be re-excavated or rebuilt so that rainwater can be stored and reused during dry periods. Sixth, groundwater use should be monitored carefully to prevent further decline in water tables. Seventh, efficient irrigation will allow more land to be cultivated and reduce rice fallow areas.



Problem tree and solution tree

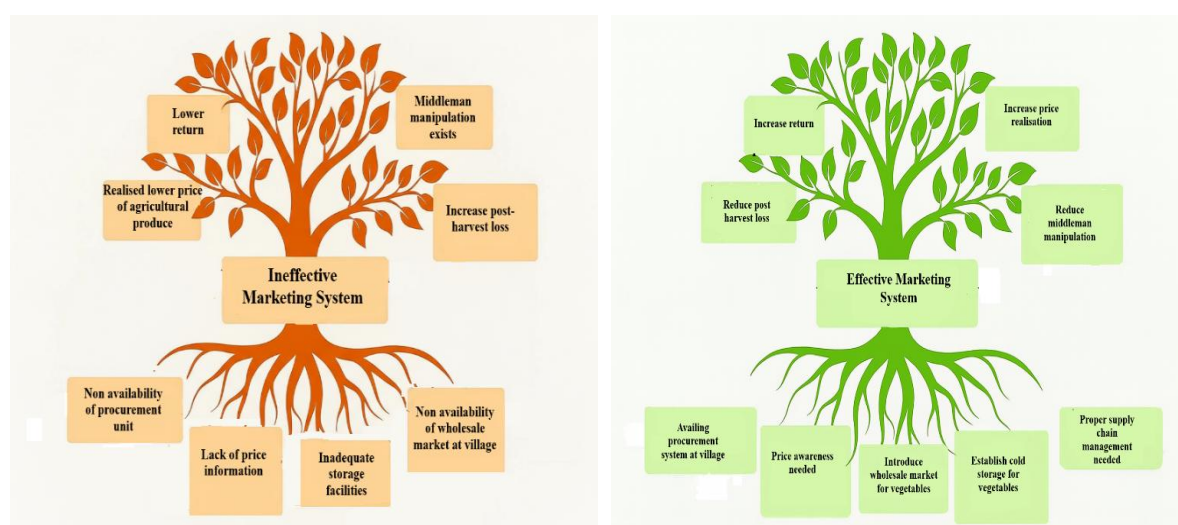
Problem 2: Ineffective Marketing System

Farmers in the villages face major problems because the marketing system is ineffective. They often get very low prices for their agricultural produce, even after working hard throughout the season. Middlemen play a large role in the market and often manipulate prices, which reduces the farmers' share of income. Another serious issue is the lack of procurement units in local areas. Without nearby procurement facilities, farmers are forced to sell to local traders at lower prices. They also do not have proper information about market prices, so they cannot decide when and where to sell their crops. This weakens their bargaining power. In addition, there are no wholesale markets in many villages. Farmers must travel far to sell their produce, which increases cost and time loss. Inadequate storage facilities also cause post-harvest losses, especially for vegetables and other perishable crops. Because of this, farmers are often forced to sell quickly at low prices. All these problems together lead to lower returns, increased losses, and reduced farm income. The ineffective marketing system makes farming less profitable and creates a major barrier to rural economic development.

Solution 2: Effective Marketing System

Several practical steps can improve the marketing system and help farmers earn better returns. First, procurement systems should be made available at the village level. If farmers can sell directly to procurement centres, they will get fairer prices and depend less on middlemen. Second, farmers need regular price awareness. Market price information should be shared through mobile phones, notice boards, radio, and village meetings. This will help farmers know the right time and place to sell. Third, wholesale markets for vegetables and other crops should

be introduced near farming areas. This will reduce travel costs and increase access to larger buyers. Fourth, cold storage facilities should be established for vegetables and other perishable crops. Proper storage will reduce post-harvest losses and allow farmers to sell when prices are better. Fifth, better supply chain management is needed so that produce moves smoothly from farms to markets. Sixth, market cooperatives and farmer-producer organizations should be strengthened. These groups can help farmers negotiate better prices and reduce dependence on middlemen. Finally, digital marketing platforms can connect farmers directly with buyers. These measures will increase price realization, reduce losses, and improve farm income.



Problem tree and solution tree

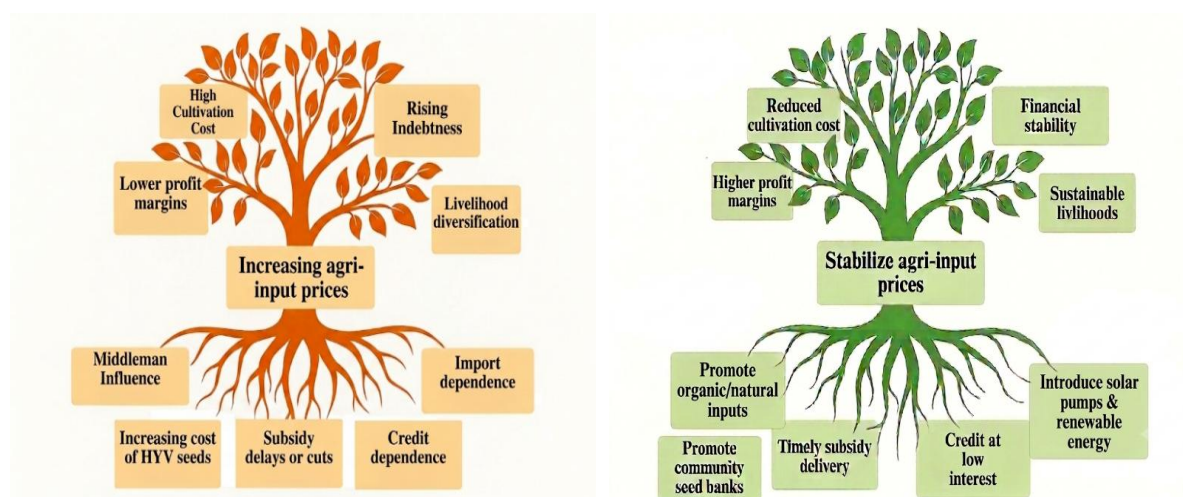
Problem 3: Increasing Agri-Input Prices

Farmers in the villages are facing serious problems because the prices of agricultural inputs are increasing every year. Seeds, fertilizers, pesticides, and irrigation costs are all becoming more expensive. As a result, the overall cultivation cost is rising sharply, and farmers are finding it harder to continue farming profitably. One major issue is the high price of HYV seeds. Farmers need improved seeds for better yield, but these seeds are often costly and not always available on time. Another problem is the influence of middlemen, who increase prices by controlling supply. Many farmers are forced to buy inputs at higher rates because they have no direct access to suppliers. Import dependence also makes input prices unstable. When inputs are brought from outside, farmers have to pay more. In addition, subsidy delays or cuts create extra pressure on farmers, because they cannot get timely financial support. Credit dependence increases their debt burden, while rising input costs reduce their profit margins. Because of these problems, farmers are unable to save money or expand their farming activities. Many are pushed into

debt, and some even try livelihood diversification to survive. The increasing cost of agri-inputs is therefore a major barrier to farm profitability and rural economic stability.

Solution 3: Stabilizing Agri-Input Prices

Several practical steps can help stabilize agri-input prices and reduce the burden on farmers. First, organic and natural inputs should be promoted. Using compost, green manure, bio-fertilizers, and bio-pesticides can reduce dependence on costly chemical inputs. Second, community seed banks should be encouraged. These local seed banks can supply quality seeds at lower cost and reduce dependence on private sellers. Third, subsidies must be delivered on time. Timely subsidy support helps farmers buy inputs when they need them and reduces financial stress. Fourth, farmers should be given access to credit at low interest. Affordable loans can help them manage input costs without falling into a debt trap. Fifth, the use of solar pumps and renewable energy should be promoted to reduce irrigation costs and dependence on expensive power or diesel. Sixth, better regulation of input markets is needed to control middleman influence and unfair pricing. Seventh, local production of seeds and inputs should be encouraged to reduce import dependence. This can make supply more stable and affordable. Finally, training on cost-saving farming methods can help farmers use inputs more efficiently. These measures will reduce cultivation cost, improve profit margins, create financial stability, and support sustainable livelihoods for farming families.



Problem tree and solution tree

5.3 Conclusion

The analysis of problems and solutions across the villages highlights that while each village has its own specific issues, common themes emerge: unreliable irrigation, poor market access, limited fertilizer availability, and increasing fallow land. These challenges collectively restrict agricultural productivity and rural income.

The proposed solutions such as improving irrigation systems, developing market infrastructure, ensuring timely fertilizer supply, promoting cooperative farming, and introducing modern technologies offer practical ways forward. If implemented effectively, they can reduce post-harvest losses, increase cropping intensity, and strengthen farmers' bargaining power.

Ultimately, the chapter shows that sustainable rural development requires both infrastructural improvements and institutional support. By combining better resource management, modern farming practices, and stronger market systems, villages can overcome existing barriers and move toward higher productivity, better incomes, and more resilient livelihoods

Chapter - 6: Conclusion and Policy Suggestions

6.1 Introduction

The present study was undertaken to examine the socio-economic, demographic, livelihood, agricultural, infrastructural, institutional, and environmental conditions of the Visva-Bharati-associated adapted villages and to assess their potential for development as model villages. The study covered six adapted villages: Raipur, Nurpur, Kankutia & Kartickdanga, Halsidanga, Srichandrapur, and Kamarpara, located in Bolpur-Sriniketan and Illambazar blocks of Birbhum district, West Bengal. The analysis adopted a multidimensional approach, combining village-level information, Focus Group Discussions (FGDs), institutional records, direct observations, agricultural and livelihood information, and Sentinel-2-based land-use analysis for 2017 and 2024. The study also examined the role of Visva-Bharati in rural development and constructed a Model Village Potential Index (MVPI) to assess the relative developmental potential of the selected villages.

The findings demonstrate that the villages have considerable developmental assets, including agricultural resources, water bodies, community institutions, Self-Help Groups (SHGs), educational facilities, road connectivity, electricity, digital connectivity, and a long history of institutional engagement with Visva-Bharati. At the same time, the villages exhibit substantial variations in their resource base and developmental needs. The differences are particularly visible in irrigation availability, agricultural intensity, market access, healthcare, educational opportunities, institutional support, environmental management, and livelihood diversification. Therefore, a uniform development strategy for all six villages would not be appropriate. The policy approach needs to be village-specific, resource-based, participatory, and institutionally coordinated.

The study also confirms the continued relevance of Rabindranath Tagore's concept of rural reconstruction. The Sriniketan experiments were founded on the principle that village development should integrate economic improvement with education, culture, social responsibility, self-reliance, and community participation. The experiences of the selected villages indicate that this integrated approach remains relevant to contemporary rural transformation.

6.2 Major Findings of the Study

6.2.1 Strong Foundation for Integrated Rural Development

The demographic and socio-economic profile indicates that the selected villages possess several favourable characteristics that can support long-term rural development. The six villages together represent diverse social, religious, demographic, and livelihood conditions. Literacy levels vary considerably, with Raipur recording the highest literacy rate, followed by Nurpur, and Halsidanga and Srichandrapur recording the lowest. Kamarpara, Raipur, and Nurpur have high sex ratios, indicating a relatively favourable gender composition. The villages also display considerable social and religious diversity, while the report identifies relatively strong social harmony and collective participation.

The presence of pucca roads, electricity, drinking water facilities, mobile connectivity, internet access, PDS facilities, libraries, schools, SHGs, and community organizations provides a basic platform for further development. The study, therefore, finds that the villages are not starting from a situation of complete infrastructural deprivation. Rather, the major policy challenge is to convert the existing infrastructural foundation into productive economic opportunities and sustainable improvements in quality of life.

6.2.2 Agriculture is the Principal Economic Foundation

Agriculture remains the principal livelihood activity in most surveyed villages, although Nurpur is distinctive in having fisheries as its primary livelihood. Agricultural systems vary considerably in cropping intensity, irrigation, crop diversification, productivity, and access to resources.

Raipur has a three-season agricultural system and a high cropping intensity, supported by relatively reliable irrigation. Kankutia & Kartickdanga, along with Halsidanga, have an exceptionally intensive agricultural system with high cropping intensity. Kamarpara, despite having a comparatively smaller agricultural land base, records a low cropping intensity. In contrast, Nurpur has a very low cropping intensity and experiences a substantial contraction in cultivated area during the Rabi season due to inadequate irrigation. These findings indicate that the villages possess significant potential for agricultural intensification and diversification, but the realization of this potential depends strongly on reliable irrigation, appropriate technology, input availability, market access, storage, and extension services.

The high productivity observed in crops such as potato, paddy, vegetables, and chilli in several villages demonstrates that the agricultural sector can generate substantially higher returns when supported by irrigation and appropriate production practices. However, increasing input costs, labour costs, irrigation expenditure, inadequate access to fertilizers, and weak marketing arrangements remain important constraints.

6.2.3 Water Availability is a Critical Determinant of Agricultural Performance

One of the strongest findings of the study is the close relationship between water-resource availability and agricultural performance. Villages with better access to the Ajay River and well-developed pond systems generally exhibit better irrigation conditions and greater potential for multi-season cultivation. Raipur, Nurpur, and Kankutia & Kartickdanga benefit from comparatively favourable water resources, whereas Srichandrapur and Kamarpara face greater structural constraints due to the absence of direct river access.

Srichandrapur has 25 ponds, but these are insufficient to meet its broader irrigation requirements. Kamarpara similarly has only 14 ponds, primarily used for fisheries and domestic purposes, while agriculture remains dependent on rainfall and limited pond and groundwater resources. These conditions limit crop diversification and increase farmers' vulnerability during dry periods. The study, therefore, concludes that water security should be treated as a central component of model-village development, rather than an isolated agricultural intervention.

6.2.4 Increasing Developmental Pressure on Agricultural Land

The land-use analysis based on Sentinel-2 imagery for 2017 and 2024 reveals that the villages are experiencing varying degrees of transformation. Agriculture continues to dominate the landscape in most villages, but built-up areas have expanded in several locations.

The change is particularly pronounced in Kamarpara, where cropland declined from 85.38% of the geographical area in 2017 to 67.86% in 2024, while the built-up area increased from 13.96% to 29.80%. Nurpur and Raipur also experienced a decline in the share of cropland, accompanied by an increase in built-up land. Kankutia & Kartickdanga saw cropland decline from 87.89% to 85.15%, while built-up land increased from 10.10% to 12.14%.

The findings suggest that rural development is increasingly accompanied by settlement expansion. While such transformation reflects socio-economic progress, uncontrolled conversion of productive agricultural land could undermine long-term food security and livelihood sustainability. Land-use planning therefore needs to balance housing and infrastructure requirements with the protection of productive agricultural land and ecological resources.

6.2.5 Visva-Bharati has played an Important Role in Human, Social, Cultural and Livelihood Development

The study demonstrates that Visva-Bharati's contribution extends beyond conventional agricultural extension. Through the Rural Extension Centre, Rathindra Krishi Vigyan Kendra, Palli Samgathana Vibhaga and associated institutional activities, Visva-Bharati has supported agricultural training, livelihood development, cultural activities, libraries, awareness programmes, SHGs, youth participation, irrigation-related interventions, and platforms for showcasing village products.

The success stories documented in the report provide concrete evidence of the potential of institutional intervention. The Bratee Dal initiative in Nurpur illustrates the importance of youth participation, cultural activities, environmental awareness, community service, and social cohesion. The experiences of women entrepreneurs and artisans demonstrate that skill development and institutional support can transform traditional skills into sustainable livelihood opportunities.

Similarly, the experience of Paritosh Biswas in Srichandrapur shows how agricultural training, improved planting material, exposure to wider markets, and technical guidance can encourage crop diversification and improve farm income. His reported increase in farming income of around 15–20% illustrates the potential returns from knowledge-based agricultural interventions.

The study, therefore, concludes that institutional continuity is one of the major strengths of the adapted villages. The challenge is to expand these interventions from individual success stories and periodic programmes into larger community-level livelihood systems.

6.2.6 Infrastructure is Relatively Strong, but Social Services Remain Uneven

The MVPI analysis shows that infrastructure is the strongest performing dimension across the selected villages. The average infrastructure scores are generally high, with Nurpur recording 7.85 and Raipur 7.71. The study finds strong performance in roads, electricity, drinking water, schools, communication, and PDS services.

However, the analysis also reveals important deficiencies within the infrastructure dimension. Healthcare services record a relatively low average score of 4.83, while village community-centre facilities are particularly weak in Halsidanga, Srichandrapur, and Kamarpara. Drainage and sanitation also require attention in Kankutia & Kartickdanga and Kamarpara. Thus, the future development agenda should move beyond basic physical infrastructure toward quality, accessibility, and functionality of social infrastructure.

6.2.7 Education and Healthcare Require Greater Attention

The report shows that educational attainment is uneven across the villages. While some villages have secondary and higher secondary schools, Srichandrapur and Kamarpara have only primary-level educational facilities. Healthcare is a more widespread concern, with several villages depending on distant health facilities or sub-centres.

The implication is that access to basic infrastructure alone does not ensure human development. Model-village development must also address continuity of education, higher-secondary access, vocational and digital skills, preventive healthcare, maternal and child health, and timely medical services.

6.2.8 Social Capital and Women's Participation Constitute Important Strengths

The presence of SHGs across the villages is a significant institutional asset. The number of active SHGs ranges from 12 in Srichandrapur to 143 in Nurpur. These groups provide a foundation for women's participation in savings, credit, livelihood activities, social awareness, and collective action.

The success stories of women-led enterprises further demonstrate the potential for rural women to become producers, entrepreneurs, artisans, and employment generators. The Maa Durga Hastashilpa enterprise in Halsidanga, for example, has developed into a women-employing craft enterprise, demonstrating the potential of skill development and institutional support to

generate substantial livelihood improvements. Therefore, women-centred development should be treated not merely as a welfare intervention but as a core economic strategy for model-village development.

6.2.9 The Gap Between Infrastructural Development and Productive Sustainability

The Model Village Potential Index provides one of the most important conclusions of the study. The index covers five dimensions Infrastructure, Economic, Farming, Social, and Environmental and 87 sub-indicators. Infrastructure carries a weight of 24%, Economic 21%, Farming 25%, Social 16%, and Environmental 14%.

The results show that Halsidanga and Raipur have relatively stronger overall performance, while Nurpur records the lowest MVPI score. Importantly, however, the lower overall score of Nurpur does not imply an absence of development potential. Rather, its strong infrastructure and social capital coexist with weaker farming and environmental performance.

The most important finding from the MVPI is therefore that infrastructure alone is insufficient to create a model village. Across the six villages, infrastructure performs strongly, while economic and social dimensions remain moderate, and farming and environmental dimensions remain comparatively weak.

6.2.10 The Villages Require Differentiated Development Strategies

The study demonstrates that the six villages cannot be treated as homogeneous development units. Raipur has strong agricultural potential, relatively diversified farming, extensive water resources, and a strong institutional base, but requires improvement in irrigation efficiency, agricultural marketing, and healthcare.

Nurpur has strong fisheries potential, extensive SHG participation, and relatively strong infrastructure, but needs greater agricultural diversification, dry-season irrigation, fisheries value addition, and environmental management.

Kankutia & Kartickdanga have the strongest agricultural orientation, high cropping intensity, extensive irrigation, and considerable potential for commercial agriculture. Their major priorities should be market infrastructure, input management, sustainable intensification and protection of agricultural land.

Halsidanga performs strongly overall and has high literacy, agricultural intensity, and livelihood potential, but requires improved market infrastructure, irrigation efficiency, healthcare access, and institutional support.

Srichandrapur has a strong agricultural base and examples of successful knowledge-based farming, but requires particular attention to irrigation, higher education, healthcare, market linkages, and environmental management.

Kamarpara has substantial entrepreneurial and craft potential, but rapid conversion of agricultural land into built-up land, inadequate irrigation, limited educational and healthcare facilities, and weak agricultural institutions require urgent attention.

This differentiated approach is consistent with the study's central finding that rural development should be based on local resource endowments and locally identified constraints rather than a uniform package of interventions.

6.3 Policy Suggestions

The findings of the study indicate that the adapted villages possess a strong foundation of physical infrastructure, agricultural resources, community institutions, and social capital, but significant gaps remain in agricultural productivity, livelihood diversification, human development, and environmental sustainability. Therefore, the development strategy needs to move beyond an infrastructure-centred approach towards an integrated model that promotes productive agriculture, diversified livelihoods, women's and youth participation, improved social services, environmental sustainability, and institutional coordination. The Model Village Potential Index (MVPI) provides a useful basis for identifying village-specific priorities and monitoring developmental progress, while Visva-Bharati's institutional presence can continue to support knowledge transfer, capacity building, and community participation. In this context, the following policy suggestions are proposed to strengthen the development potential of the adapted villages and facilitate their gradual transformation into self-reliant, inclusive, and sustainable model villages, consistent with the broader vision of integrated rural reconstruction associated with Sriniketan and Visva-Bharati.

6.3.1 Village-Specific Development Planning

A Village-Specific Development Plan should be prepared for each adapted village, based on its resource potential, major constraints, and MVPI performance. The planning process should involve Visva-Bharati, Gram Panchayats, SHGs, farmer groups, youth organizations and relevant government departments.

6.3.2 Strengthening Irrigation and Water Management

Priority should be given to pond rejuvenation, canal repair, rainwater harvesting, farm ponds, solar irrigation, and micro-irrigation. Efficient water management is particularly important for Raipur, Nurpur, Srichandrapur, and Kamarpara.

6.3.3 Agricultural Modernization and Diversification

The low farming performance reflected in the MVPI requires greater emphasis on crop diversification, climate-resilient varieties, soil health management, improved irrigation, mechanization, and strengthened agricultural extension services. High-value crops, vegetables, and other suitable commercial crops should be promoted along with appropriate storage and marketing facilities.

6.3.4 Strengthening Farmer Institutions and Markets

Farmer groups and FPOs should be strengthened to facilitate collective input purchase, storage, processing, and marketing. Village-level collection centres, warehouses, cold-storage facilities, and improved market information systems should be developed to reduce distress sales and dependence on intermediaries.

6.3.5 Livelihood Diversification and Women's Entrepreneurship

Rural development should extend beyond agriculture by promoting fisheries, livestock, handicrafts, and micro-enterprises. SHGs should be linked with enterprise development, branding, digital marketing, credit, and wider markets. The successful enterprises in Halsidanga and Kamarpara can serve as local models for replication.

6.3.6 Youth, Education, and Healthcare

Greater attention should be given to vocational and digital skills, entrepreneurship, and youth engagement. Secondary and higher-secondary educational opportunities should be strengthened, particularly in villages with limited facilities. Primary healthcare, mobile medical services, and preventive-health programmes should also be improved.

6.3.7 Environmental Sustainability and Land Management

Environmental management should focus on waste management, rainwater harvesting, renewable energy, water-body conservation, tree plantation, and climate awareness. At the same time, increasing conversion of agricultural land into built-up areas should be carefully monitored through village-level land-use planning.

6.3.8 Strengthening the Visva-Bharati–Village Partnership

The long-standing institutional relationship between Visva-Bharati and the adapted villages should be strengthened through a coordinated development platform involving the Rural Extension Centre, Rathindra Krishi Vigyan Kendra, Gram Panchayats, SHGs, farmer groups, and community organizations. This would help integrate existing interventions and ensure continuity of rural development activities.

6.3.9 Institutionalizing MVPI-Based Monitoring

The MVPI should be used as a regular monitoring tool rather than merely a ranking mechanism. It may be reassessed every two to three years to measure progress in infrastructure, economic conditions, farming, social development, and environmental sustainability.

6.3.10 Village-Specific Priorities

The policy approach should be differentiated according to local conditions. Raipur should focus on intensive and diversified agriculture, irrigation efficiency, and marketing; Nurpur on fisheries, dry-season agriculture, women's enterprises, and environmental management; Kankutia & Kartickdanga on commercial agriculture, water-efficient farming, and market infrastructure; Halsidanga on consolidating its relatively strong overall performance while improving healthcare, irrigation and environmental sustainability; Srichandrapur on water

security, agricultural commercialization, education and healthcare; and Kamarpara on protecting agricultural land while promoting its strong craft and entrepreneurial potential.

6.4 Conclusion

The present study concludes that the six adapted villages associated with Visva-Bharati have substantial potential to become sustainable, self-reliant model villages. The villages have a strong combination of agricultural resources, community institutions, social capital, physical connectivity, digital access, and institutional support. The long-standing engagement of Visva-Bharati has contributed not only to agricultural and livelihood development but also to cultural preservation, women's empowerment, youth participation, and community mobilization.

At the same time, the study demonstrates that the process of rural transformation remains incomplete. The major constraints are not limited to basic infrastructure; rather, they relate to the quality and sustainability of economic development. Inefficient irrigation, seasonal water scarcity, weak agricultural marketing, inadequate storage, limited fertilizer availability, limited farmer organizations, insufficient agricultural extension, declining agricultural land in some villages, inadequate healthcare, gaps in higher education, limited livelihood diversification, and weak environmental management continue to constrain development.

The Model Village Potential Index provides clear evidence of this dual reality. Halsidanga and Raipur perform relatively strongly, while Kankutia & Kartickdanga, Srichandrapur, and Kamarpara occupy intermediate positions, and Nurpur records the lowest composite score. However, the differences should not be interpreted simply as a ranking of success and failure. Rather, they reveal the specific developmental priorities of each village. A village with strong infrastructure but weak farming and environmental performance requires a different policy package from a village with strong agriculture but weaker healthcare or educational infrastructure.

The study therefore recommends a differentiated, participatory, and institutionally coordinated approach. Agricultural development should focus on water security, crop diversification, modern technology, soil health, collective marketing, storage, and value addition. Livelihood policy should promote fisheries, livestock, handicrafts, micro-enterprises, and skill-based employment. Social development should prioritize healthcare, education, women, and youth. Environmental policy should emphasize water conservation, renewable energy, waste

management, biodiversity and climate resilience. At the institutional level, the long-standing relationship between Visva-Bharati and the adapted villages should be strengthened and transformed into a systematic village-development partnership.

Most importantly, the experience of these villages demonstrates that a model village should not be defined merely by the presence of roads, electricity, buildings, or other physical assets. A genuinely model village should be one in which economic opportunity, social inclusion, cultural vitality, environmental sustainability, institutional participation, and human dignity reinforce one another. This understanding is closely aligned with Tagore's original philosophy of Sriniketan, in which rural reconstruction was conceived as a process of creating self-reliant, creative, cooperative, and dignified communities.

The future development of the six adapted villages should therefore seek to transform existing strengths into sustainable capabilities. If the recommended interventions are implemented through community participation and coordinated institutional action, the villages can progress from being adapted villages to becoming demonstration sites of integrated rural development, providing a practical contemporary expression of Tagore's enduring vision of rural reconstruction.

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