



PARTICIPATORY GAP ANALYSIS

A STUDY ON SELECTED VILLAGES OF PURULIA AND BANKURA



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EXECUTIVE SUMMARY

In the western region of West Bengal, districts like Bankura and Purulia face significant agricultural challenges due to complex seasonal land use patterns and environmental constraints (Sarkar, Goari & Modak, 2024). Climate change has exacerbated these issues, resulting in erratic weather patterns, decreased annual precipitation, and increased temperatures in these western districts of Bengal (Nandagiri & Barman, 2018). Women farmers, playing a vital role in agriculture, are disproportionately affected due to gender-related inequalities (Chatterjee & Dwivedi, 2023).

This project report on *Hura and Jhalda-II, Purulia, and Taldangra, Bankura aims to promote sustainable agricultural development* by examining seasonal land use, climate change impacts, adaptive strategies, and women's participation. *Objectives include understanding these patterns and incorporating women's perspectives.* The study uses an inductive approach with focus group discussions (FGDs) for gap analysis, collecting data through field visits and surveys. Ten locations in Bankura and Purulia were selected, with ten FGDs involving 12-15 members each. Data was gathered using structured guides and audio recordings, followed by thematic analysis.

Compared to other areas (Jhalda-II and Taldangra) of intervention, Hura Block shows the following status in their agricultural practices:

- Crop cultivation is hindered by *water scarcity* and *adverse climate effects*.
- Agricultural *decisions are collective*, with both men and women participating.
- Community engagement through *self-help groups (SHGs) is strong*.
- *Awareness level needs to be improved* regarding natural resources and energy issues.
- There is no *solar-based agriculture (climate-smart agriculture)*.
- *Farm ponds are underutilised*, and there is a strong interest in training on water conservation and organic farming.

The findings clearly indicate the need for the creation of resources like farm ponds and the introduction of community training programs related to climate-smart agriculture in the block.

This participatory gap analysis has indicated significant agricultural challenges due to climate change, water scarcity, and limited knowledge of advanced farming techniques in Hura Block. Implementing the following recommendations will help bridge the gaps identified in Hura. Enhanced training, capacity building, and maintenance of existing resources, along with technical support will help to promote sustainable development and empower women farmers in all the 3 intervention regions- Hura, Jhalda-II and Taldangra.

- A) Enhance Training Programs**
- B) Improve Resource Utilization**
- C) Address Agricultural Challenges**
- D) Support Livelihood Opportunities**
- E) Utilise Land Effectively**

1. INTRODUCTION

Agricultural challenges due to complex seasonal land use patterns and environmental constraints is evident in the western region of West Bengal, districts like Bankura and Purulia (Paria, Mishra & Behera, 2022). ***Large areas of land in these districts are unsuitable for intensive farming*** because of unfavourable soil and water conditions. Climate change has exacerbated these challenges, resulting in erratic weather patterns, decreased annual precipitation, and increased temperatures. Consequently, these changes have led to reduced crop yields, water scarcity, and higher incidences of pests, diseases, and weeds. The net irrigated land in Purulia district is only 21.57% of the gross cropped area (GoWB District Profile, 2024). About 60% of the total cultivated land in Purulia is upland, which is predominantly monocropped (Purulia Municipality, 2023). Similarly, Bankura, a drought-prone district, experiences 80-90% of its annual 1400 mm rainfall between June and September, but faces exacerbated drought conditions due to the lack of significant rainfall in September and October, high runoff rates, inadequate storage facilities, low soil water-holding capacity, undulating terrain, and fragmented lands (GoWB Disaster Management, 2024).

Women farmers, who play a vital role in agriculture, are disproportionately affected by these issues due to gender-related inequalities in access to land, technology, and decision-making power varying from region to region. Their challenges are compounded by the broader impacts of climate change, which further hinder their ability to adapt and respond effectively. In the western districts of Bengal, traditional gender roles have historically placed men in control of agricultural decision-making, including income and expenditure related to farming. However, recent initiatives, particularly through Self-Help Groups (SHGs), have begun to shift these dynamics (Kumbhakar, Pandey, & Khymdeit, 2021). ***Women are increasingly participating in decision-making processes*** regarding crop selection, farming techniques, and financial management. Reports indicate that about 75% of women involved in these groups feel they are treated equally to men, reflecting a notable change in societal perceptions and roles.

The project report proposes actionable solutions to enhance equitable and sustainable agricultural development by addressing the participatory gap in agriculture. It examines how climate change and land use patterns affect practices, highlighting the need for strategies to boost climate resilience and address gender-specific barriers faced by women farmers. Focusing on the Hura Block of Purulia, the report aims to address gaps in regenerative agriculture with a gender-sensitive approach, comparing it with Jhalda II and Taldangra Blocks. It will outline intervention areas and conduct a participatory Gap Analysis to identify challenges and priorities, involving community members in developing tailored solutions.

2. DISTRICT PROFILE

PURULIA: Purulia, the westernmost district of West Bengal, lies between the state's alluvial plains and Jharkhand, within the Chota Nagpur plateau. Spanning 6259 sq km, it is highly drought-prone and recognized as a hazardous zone due to its identified meteorological drought. The district receives an uneven annual rainfall of 1100-1500 mm. About 60% of Purulia's cultivated land is upland. Research indicates a predominant presence of meteorological drought in the area. Purulia encompasses four main river basins: Kasai, Damodar, Dwarkeswar, Kangsabati, and Subarnarekha.

BANKURA: Bankura district spans 688,200 hectares and is both rain-fed and drought-prone. Agriculture dominates, with 65.27% of the population engaged in it—21.12% as cultivators and 44.15% as labourers. The total cropped area is 492,227 hectares, with a net sown area of 337,310 hectares and a net irrigated area of 276,900 hectares (56.25% of the cropped area). Bankura experiences frequent droughts, receiving around 1400 mm of erratic rainfall annually. Factors such as high runoff rates, inadequate rainwater storage structures, degraded traditional water harvesting systems, silted surface water bodies, and low soil water retention exacerbate drought conditions.

3. AIM & OBJECTIVE:

3.1. AIM:

This project aims to investigate seasonal land use patterns, climate change impacts on agriculture, adaptive strategies, and the active participation of women farmers in the study.

3.2. OBJECTIVE:

The following objectives have been taken into consideration to achieve the anticipated aim.

- A) To understand the **seasonal patterns of land use and identify reasons behind the non-utilization** of certain lands during specific seasons.
- B) To assess the **impact of climate change on weather patterns, crop cultivation, and livelihoods**, and to **explore adaptive strategies employed by women farmers**.
- C) To actively **capture the participation and perspectives of women farmers, enhancing understanding of their roles in agricultural adaptation strategies.**

4. METHODOLOGY:

4.1. RESEARCH APPROACH

Inductive logic is applied to the *focus group discussions* of the participatory gap analysis study. Primary data are collected through *field visits and surveys* to gain comprehensive insights into the effects of climate change on agriculture, highlighting farmers' adaptive strategies and their land use patterns. A qualitative research approach is used in this study to capture community members' participation. Descriptive research methods are utilized to enhance understanding of the present agro-climatic conditions and land use patterns in the region.

4.2. STUDY AREA AND POPULATION SAMPLING

10 locations from the districts of Bankura and Purulia have been selected for the study and **ten FGDs** are conducted, each consisting of **12-15 members** (Table 1).

Table 1: Snapshot of FGDs

Sl No.	District	Block	Village	No. of Women Participants
1	Purulia	Hura	Korondi	11
2				13
3				12
4		Jhalda II	Barudi	15
5			Chargali	13
6	Bankura	Taldangra	Bibarda	14
7			Seuli	12
8			Saralia	11
9			Laltagora	15
10			Konjhaboni	13

4.3. METHODS AND TOOLS

Structured FGD Guides are followed for data collection. All the 10 group discussions are audio-recorded, with due permission from the participants. Hand notes are taken by the researchers, particularly on the non-verbal observations, and the setting. All recorded FGDs are transcribed and translated into English. The data is thematically analysed using QD-miner software, patterns are identified, and insights are drawn from the data.

5. FINDINGS FROM HURA BLOCK

5.1. ACTIVE COMMUNITY ENGAGEMENT WITH LIMITED AWARENESS

- **Active SHG Network**

- Korondi hosts *several active self-help groups (SHGs)*, including Korondi Maa Bhabani Mahila Samity, Korondi Kalyanmayee Samity, Korondi Anurag Mahila Samity, Korondi Kalyanmayee Swanirbhar Dol, and Disha Mahila Samity.
- These groups, with *10-16 members each*, have *facilitated training programs in skills* such as *incense stick making, sewing, handloom, and agricultural practices*, primarily through panchayats and NGOs. While these training sessions have been somewhat effective, their *impact is limited by resource constraints and inadequate trainer contact*.

- **Limited Awareness and Knowledge of Natural Resources and Energy**

- A) Participants have a limited awareness of natural resources and energy issues. Although they use groundwater, they lack comprehensive knowledge about this resource, this is evident from their silence in the question if they are aware of ‘natural resources’.
- B) They are aware of solar energy benefits but do not have full access to government facilities, including solar pumps for agricultural irrigation. This results in significant reliance on rainwater and diesel pumps, leading to high costs and limited availability of irrigation.

5.2. CROP CULTIVATION PRACTICES

- **Diverse Crop Cultivation Practice with a focus on Paddy:**

- A) *Paddy is the primary crop*, heavily reliant on available rainwater and pond water for irrigation.
- B) Despite challenges, participants cultivate *a variety of secondary crops*, including mustard, potato, onion, brinjal, cabbage, cauliflower, tisi, khosla, khesari, and moong.

"I primarily grow paddy, potato, mustard, and other crops, depending on rainwater and pond water since we don't use groundwater. I struggle with a water crisis, a lack of organic fertilizers, and the unpredictable effects of climate change, like delayed and irregular rainfall."

- Bijoli Mahato, 43, Hura

- **Soil Fertility Issues and Lack of Advanced Knowledge:**

- A) *Primarily cow dung and rotten leaves are commonly used as organic manure, supplemented by chemical fertilizers like DAP, urea, and NPK.*
- B) Excessive use of urea has led to soil hardening and reduced fertility, highlighting unsustainable agricultural practices.
- C) *Participants lack knowledge of advanced fertilizers and crop varieties resistant to drought, flood, salinity, or pests.* This knowledge gap restricts their ability to adapt to changing environmental conditions and improve crop resilience.

- **Water Scarcity and Climate Change Impact:**

- A) *Rainwater and pond water are the primary irrigation sources*, creating a dependency on natural water cycles.
- B) Insufficient and irregular rainfall leads to *competition for diesel pumps* and limited availability of well water.

- C) Significant agricultural challenges stem from water scarcity and the adverse effects of climate change.

"I face severe water scarcity due to climate change and insufficient rainfall, resulting in long queues for diesel pumps and limited well water. Along with the lack of tractors, the labor shortage makes farming even harder."

-Suchana Mahato, 48 years, Hura

5.3. INRM MODELS, FARM PONDS, AND SOLAR WATER PUMPS

- **Lack of Solar intrusion**

- A) Women farmers of Hura block have a basic understanding of solar energy, but there is a lack of access to training and resources for the full utilization of solar water pumps.
- B) A few Small-scale solar pumps are installed individually, but there are no large-scale installations or training/awareness campaigns to support widespread adoption.
- C) Participants are interested in training on sustainable practices to replace diesel, highlighting a need for initiatives focused on solar water pump utilization and related sustainable practices.

- **Unavailability of the concept of 'Farm Pond'**

- A) Existing *ponds are primarily used for household purposes and occasionally for fish cultivation*, indicating their potential for multi-functional use.
- B) The lack of specific restoration requirements and training for farm ponds are persistent, which can enhance their effectiveness and sustainability.
- C) *Participants expressed interest in training on water conservation methods*, suggesting a gap in knowledge and resources that, if addressed, can improve farm pond management and usage.

- **Soil Health and Moisture Management:**

- A) Soil health and moisture are not regularly monitored, and there are no significant initiatives to improve these aspects, indicating a critical gap in sustainable agricultural practices.
- B) The lack of soil health initiatives may affect crop yields and long-term agricultural sustainability.
- C) Participants show a strong interest in training on organic farming and drip irrigation, reflecting a need for education and resources to promote sustainable and environmentally friendly farming practices.

5.4. COLLECTIVE FAMILY PARTICIPATION IN AGRICULTURE

- A) Agricultural activities in Korondi are managed collectively, with both men and women actively participating in different roles, reflecting a *cooperative and inclusive approach*.
- B) Decisions regarding land use, crop selection, and water management are made communally, reflecting a strong sense of cooperation and collective responsibility among family members.
- C) *Men, influenced by external experiences, primarily handle crop marketing*, while women focus on crop harvesting and land preparation, showing a division of labor based on traditional roles and external exposure.
- D) *Younger family members assist in various farming tasks*, and elders contribute by sorting and cleaning farm products, ensuring that all family members are engaged in agricultural activities.

6. FINDINGS FROM TALDANGRA AND JHALDA II BLOCK

Model villages of these two blocks have received assets such as solar pumps, farm ponds, and seeds through various government schemes and projects facilitated by the SwitchON Foundation. These assets benefitted numerous families in each village, enhancing their agricultural productivity and resource management. Concerning this, some of the following advancements have been noticed in the region.

6.1. MUTUAL HELP AND ASSET SHARING/SCALED-UP EFFECT OF ASSETS CREATED

- **Enhanced Resource Utilization and Agricultural Productivity:** The communal management of resources like ponds and solar pumps has significantly improved agricultural productivity across the villages. By sharing these assets, families can irrigate their lands more efficiently, leading to better crop yields and more reliable farming practices.
- **Strong Sense of Community and Mutual Help:** The villages exhibit a strong community spirit, with collective ownership and management of resources fostering mutual help. This collaborative approach not only maximizes the utility of the assets but also strengthens social bonds and ensures equitable access to critical agricultural resources.

6.2. WILLINGNESS TO EXPERIMENT WITH NEW CROPS

Respondents showed an openness to experimenting with new crops and agricultural processes, reflecting a collective interest in innovation to improve productivity.

6.3. CONSERVATION OF RESOURCES

- **Active Adoption of Renewable Energy and Water Conservation Practices:** Villagers across the discussed areas have actively adopted solar water pumps for irrigation, significantly reducing reliance on conventional energy sources and minimising groundwater depletion. Practices such as rainwater harvesting and filling ponds with groundwater during low levels indicate a strong commitment to conserving water and energy resources.

"The solar water pump and farm pond provide a steady water supply, boosting our crop yields and significantly enhancing our family income. Along with training on seed treatment and planting, my crop cultivation process has greatly improved."

-Shathi Nandi, 48 years, Taldangra

- **Awareness and Willingness to Learn:** While there is a broad awareness of the importance of conserving resources, there are varying levels of knowledge and implementation across villages. Some communities, like those in Laltagora and Konjhaboni, are more interested in learning and improving their conservation methods, highlighting an opportunity for educational initiatives and further support to enhance resource conservation practices uniformly.

6.4. INCOME ENHANCEMENT

- **Significant Increase in Agricultural Productivity and Income:** The introduction of solar pumps and ponds has markedly increased agricultural productivity across several villages, leading to higher incomes. Villages such as Barudi, Bibarda, Seuli, Saralia, Chargali, and Laltagora reported enhanced crop yields and profitability from a diverse range of vegetables, pulses, and spices, directly translating to improved financial stability for the farming families.

6.5. INCREASED UTILIZATION OF LAND

- **Recognition and Potential of Underutilized Land:** Villages identified fallow or underutilized land that could be converted for agricultural use, demonstrating an awareness of the potential for increasing productivity and income through better land utilization.

6.6. INCREASED POPULARITY OF BUND CULTIVATION

- **Diverse Bund Cultivation Practices:** Villagers engaged in various bund cultivation activities, including fisheries, kitchen gardening, and growing crops like cardamom and leafy vegetables, demonstrating a wide range of uses for bunds to enhance agricultural productivity.

6.7. INTEREST IN REGENERATIVE AGRICULTURE:

Villagers across two blocks showed a strong interest in regenerative agriculture practices, including soil fertility, organic fertilizers, and advanced farming methods, indicating a readiness to adopt sustainable agricultural practices.

"Although I've never used a solar pump before, it's been a significant help in saving money and ensuring we have enough water for our crops throughout the year. I learned that excessive fertilizer can damage the soil, so I started using dhanicha (green manure) to improve soil fertility."

-Jhuma Biswas, 36 years, Chargali

6.8. LIVELIHOOD GENERATION POTENTIAL

- **Interest in Diverse Livelihood Opportunities:** Villagers displayed a keen interest in exploring additional livelihood opportunities such as fish farming, duck farming, and other activities, utilizing the resources provided to enhance their income and sustainability.

6.9. COLLECTIVE MANAGEMENT OF MAINTENANCE

- These two blocks effectively managed the maintenance of ponds and solar pumps through collective efforts, demonstrating a strong community spirit and organization.

7. OBSERVATIONS IN TERMS OF GAPS

- A) Dependence on traditional practices in Hura:** Agricultural challenges in Hura are pronounced due to water scarcity and *limited knowledge of advanced crop varieties* and fertilizers. The community relies heavily on traditional practices, with *minimal use of advanced or organic methods*, which further hampers productivity and income enhancement.
- B) Lack of understanding of agricultural resources among the women farmers of Hura:** Resource utilization and maintenance in Hura are hindered by only a *basic understanding of resources such as solar energy and farm ponds*, coupled with a lack of specific training for their effective use. Soil health and moisture are not regularly monitored, and no significant restoration initiatives have been undertaken. Although the villagers use groundwater, *they lack comprehensive knowledge about the term ‘natural resources’*.
- C) Lack of community training programs on agricultural practices in Hura:** In Hura, the effectiveness of community training programs is significantly limited due to *inadequate contact with trainers*. While there is a basic awareness of solar energy, the community lacks access to comprehensive training and the full utilization of solar water pumps. Additionally, *knowledge about natural resources, water conservation, and advanced agricultural practices remains insufficient*.

In terms of regenerative agriculture and livelihood generation, Hura shows only *basic awareness of regenerative practices* and lacks adequate training in organic farming, water conservation, and soil health. There is also limited exploration of additional livelihood opportunities, which restricts economic growth.

The *utilization of land in Hura is suboptimal*, with underutilized land and limited bund cultivation practices. The community lacks specific training or support for effectively using fallow land, which could otherwise contribute to increased agricultural productivity and sustainability.

- D) Need for Support and Guidance in Jhalda II and Taldangra:** Villagers expressed a need for support and guidance to mitigate risks associated with experimentation in the agricultural process. Communities in Seuli, Laltagora, and Konjhaboni were particularly cautious, highlighting the importance of assistance from organizations to ensure successful implementation and adoption of new agricultural practices.

- E) Challenges and Support Needs for Jhalda II and Taldangra:** While there is significant interest in expanding bund cultivation, challenges such as soil fertility issues in Seuli and water scarcity in Konjhaboni highlight the need for targeted support, including training and resources, to optimize the use of bunds for agricultural activities and further enhance livelihood opportunities.
- F) Need for Enhanced Training in Jhalda II and Taldangra:** Despite some existing training, there is a widespread need for more comprehensive and advanced training in soil health, organic farming, and pest management to fully implement regenerative agriculture practices and improve overall agricultural productivity.

8. CONCLUSION

This participatory gap analysis reveals that the physical characteristics of the area are more significant than the social barriers. In Hura Block, while water scarcity is a major issue, gender role discrepancies are minimal. Given the current scenario in Hura, there is a clear need for interventions involving advanced farming techniques and long-term funding for their implementation. The need for infrastructural development, like solar water pumps and farm ponds are apparent from the study. The women farmers of Jhalda-II and Taldangra have demanded for training programs, and technical support for their existing resources. This approach will facilitate efficient resource utilisation through infrastructure development, underutilized land management, and bund cultivation techniques. Targeted training programs will enhance agricultural productivity, promote sustainable development, and empower women farmers in the Hura and Jhalda-II CD Blocks of Purulia, and Taldangra block of Bankura.

9. RECOMMENDATION

The following recommendations are suggested, which will be addressed in the upcoming phase-

- **Asset Management and Training:** Regular training on the maintenance and efficient use of existing assets such as farm ponds and solar water pumps need to be provided to the community members. Additionally, new farm ponds need to be established in both districts to enhance water availability and support agricultural activities.
- **Capacity Building for SHGs:** All SHGs need to undergo comprehensive capacity-building training to strengthen their roles in community development. These training sessions should focus on natural resources conservations, fund rising for solar water pump maintenance, and community engagement to ensure effective functioning and sustainability.
- **Climate-Resilient Crops and Fallow Land Utilization:** Promote the cultivation of millet and specific types of paddy as climate-resilient crops. These crops will help utilize fallow lands efficiently and increase the community's resilience to climate changes.
- **Seed Demonstration and Crop Diversification:** Organize regular multi-variety seed demonstrations to educate farmers on improved crop outcomes. Establishing a community seed bank will further support crop diversification and ensure the availability of high-quality seeds.

- **Promotion of Natural Farming Practices:** Increased number of workshops on vermicompost and azolla manufacturing to enhance natural farming practices. This will improve soil health and crop productivity while reducing reliance on chemical inputs.
- **Exposure Visits:** Facilitate exposure visits for community members to understand sustainable farming practices and effective crop cultivation technologies. These visits should focus on practical learning experiences and networking opportunities.
- **Bund Cultivation for Economic Benefits:** Enhance community awareness on bund cultivation techniques. This will enable better utilization of farm ponds and contribute to the economic well-being of the community through improved agricultural practices and water management.
- **Water Conservation Education:** Introduce the community to the 30x40 water conservation model through targeted training sessions. This will help them adopt effective water management practices, leading to better water conservation and sustainable agricultural practices.

These initiatives are designed to be implemented to address the gaps identified in Hura and to provide technical support and skills training to meet the demands of the women farmers in Jhalda-II and Taldangra. We aim to create a more sustainable and productive agricultural environment that will benefit the entire community.

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11. ANNEXURE

11.1. IMAGES FROM THE FIELD





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SwitchON Foundation, established in 2008, is a leading non-profit organisation focusing on Environment Sustainability and Equal Opportunities. Operating in 10 Indian states. It leads initiatives in Clean Energy Access, Sustainable Agriculture, Skilling, Clean Air and Sustainable Cities. Key strengths encompass innovative project implementation, capacity building, field support, awareness and advocacy.

