



# KRISHI RUPANTAR

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## BRIDGING THE GAP: TRANSFORMING ASSAM'S AGRICULTURE THROUGH FINANCIAL INNOVATION IN AGRICULTURE VALUE CHAIN FINANCE

- *Financial Services Team APART*

Assam, with its abundant natural resources and favourable climatic conditions, offers immense potential for agricultural development. Despite these advantages, Assam's farmers encounter significant challenges in accessing financial resources and modern farming techniques. One of the primary obstacles confronting the farmers is the limited availability of financial services across the agricultural value chain. Despite agriculture contributing a significant portion of the state's economy and employing over half of its workforce, access to financial services remains a pressing issue. Many farmers find it challenging to secure appropriate financial products at the right time, resulting in a lack of investment, limited or no protection of crops and animals, poor storage and limited market access leading to low productivity and profitability.

The Assam AgriFin – Xamahar initiative under the Assam Agribusiness and Rural Transformation Project (APART) operates as a Challenge Fund, channelling financial services to farmers, FPOs, and agriculture value chain players. Through the Xamahar initiative, efforts are underway to bridge the gap in agricultural finance. The Xamahar initiative aims to empower farmers with a host of innovative and customized financial products and services to enhance their productivity, improve livelihoods, and contribute to Assam's agricultural prosperity. With Ernst & Young LLP, India as the Challenge Fund Manager, Xamahar focuses on testing and scaling up innovative financial solutions through carefully selected organizations that bring in a host of financial solutions and work directly with farmers, FPOs and agriculture value chain players. Through collaborative efforts, Xamahar is paving the way for a brighter future in Assam's agriculture.

Xamahar focuses on four key themes covering Savings, Digitization of agriculture payments, Insurance (Crop, livestock, fishery, life, other perils), and Credit (Production and Investments) to revolutionize Assam's agriculture. It emphasizes savings habits among farmers and promotes digitization of payments, including cashless transactions and digital interventions for seamless transactions. The initiative also provides comprehensive insurance coverage for crops, livestock, fisheries, life, and other perils, safeguarding farmers' financial stability. In addition, Xamahar offers credit services for production and investments, collaborating with aggregators and buyers for financing, supporting post-harvest infrastructure like agri warehouses and cold chains, funding farm mechanization and assets, and facilitating receivables and dealer financing.



By empowering farmers with access to digital platforms, market linkages, and tailored financial products, the Xamahar initiative aims to transform Assam's agricultural sector, enabling farmers to adopt sustainable farming practices, increase productivity, and improve livelihoods. Through partnerships with diverse stakeholders, including Business Correspondents, Fintech companies, Small Finance Banks, and AgriTech firms, Xamahar seeks to create a vibrant ecosystem where farmers can access the support and resources needed to thrive in today's agricultural landscape.

The Xamahar initiative has achieved several milestones, including servicing approximately 100 Farmer Produce, till date, to INR 8.9 crore, with insurance coverage provided to approximately 10,000 farmers. Additionally, the initiative has facilitated financial inclusion through over 200 banking outlets. These achievements demonstrate Xamahar's commitment to supporting farmers and enhancing agricultural productivity and sustainability. The initiative offers various guarantees and assurances, including access to digital platforms, market linkages, financial products, expert advice, and capacity-building training tailored to meet farmers' specific needs.

Xamahar's offerings include facilitating digital credit for farm mechanization and promoting sustainable farming practices to enhance agricultural output. The initiative also empowers farmers through technology and data-driven solutions, de-risking the fisheries value chain through microinsurance products and data-based advisories.

Furthermore, Xamahar focuses on sustainable financial and risk management strategies, such as demonstrating the benefits of carbon markets and reducing methane emissions in rice fields. The initiative also emphasizes digital empowerment and market access for farmers by modernizing farming practices and providing expert advice on pest and disease management. The Xamahar initiative stands as a beacon of hope for Assam's agricultural sector, offering a comprehensive framework of support and empowerment for farmers to thrive sustainably and contribute to the region's long-term agricultural prosperity.



Financial Inclusion camps with the farmers



## EMPOWERING ASSAM'S FARMING COMMUNITIES: APART'S INITIATIVES WITH FARMER PRODUCER COMPANIES (FPCs)

- *Probin Kumar Bharali, Cluster Development Specialist*  
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The agriculture sector has been the backbone of the Indian economy since Independence. Over the years, the sector has witnessed significant changes, overcome challenges, and made remarkable achievements that have shaped and developed the nation's economy and helped the farmers. The Government has implemented policies, schemes, and programs to support agricultural development and position India in the global agriculture market. From being self-sufficient to leading the country in exports, the agriculture sector has come a long way.

Assam is blessed with fertile soil and favorable climatic conditions, making 70% of the total population directly or indirectly dependent on agriculture. Although Assam is popular for "Assam Tea," rice is the predominant crop besides abundant cultivation of mustard (oil seeds), potato, various seasonal vegetables and fruits, coconut, arecanut, sugarcane, Jute, etc. Several agro-based industries have mushroomed in the state over the years, and their operations and sustainability are based on the agricultural produce of the state. However, farmers in Assam are grappling with various challenges, such as small and fragmented landholdings, frequent exposure to natural calamities, limited technical know-how, inadequate irrigation, and inadequate financial resources. Also, lack of quality seeds, poor storage, organized markets, resistance in the adoption of multiple cropping patterns, modernization,



Empowering FPCs towards establishing CSCs

and mechanization of agriculture techniques. To overcome these challenges, policies are formulated, and schemes are implemented to reach out to farmers at an individual level and also through collectivization.



Capacity building of FPCs of Silk Value Chain

The concept of Farmer Producer Companies (FPCs) has given a transformative wave upsurge in the rural agricultural scenario. This paradigm shift in the governance of agriculture by aggregating small-scale farmers into cohesive units for pooling resources, knowledge, and expertise has enabled them to negotiate better prices, access credit facilities, and produce input and farming techniques.



Realizing the needs and potential of the farmers, the World Bank-funded "Assam Agribusiness & Rural Transformation Project (APART)" initiated the process to mitigate the constraints by strengthening backward and forward linkages to integrate producers and markets and make the value chains compact and efficient. To achieve this goal, APART is promoting 125 FPCs across three significant value chains, namely Agri-Horti, Fishery, and Silk, which are owned and managed by farmers. Through this FPC intervention, APART is also giving importance to developing the capacity and skills of FPC members in post-harvest management, governance, value addition, and marketing of the produce for better price realization of FPC products. The business development support extended from APART is multi-pronged for the overall growth and sustainability of the FPCs.

**The following are the broad heads under which the FPCs have been supported:**

***1. Social Mobilization and Organizational Building:*** Promoting an FPC is the collectivization of a homogenous community with similar aspirations. Therefore, proper knowledge and information to the FPC as a subject is of utmost importance. For this reason, regular training and capacity building on governance, bookkeeping, accountancy, financial management, and meeting compliances are conducted to ensure the strengthening of internal capacities and decision-making skills. The batches of CEOs, Accountants, and BoDs were imparted training on FPC organizational management and financial management and compliances with the support of technical experts from various fields and Chartered Accountants in a 3-day residential training. In addition to this training, Post-Harvest Management, and Safe Seed Storage were also conducted.



**2. Value Addition and Product Diversification:** The sustainability of the FPCs depends largely on the supply chain management of the primary products. The pre-production and post-production stages are very crucial to the FPCs, so need-based input in terms of materials and knowledge was provided to ensure profitability and competitiveness. Moreover, venturing into areas like processing units, seed production, input supply, and supplementary and by-products is feasible and will enhance the current income in seeded minds of FPC shareholders catalyzing innovation.

- For the first time in Assam, Certified Paddy seed production and marketing have been initiated in 3 FPCs (FY-2020-21) and have been able to gather good response, and it has been upscaled to 12 more FPCs. Establishment of 3 Seed Production Units out of which 1 is already functional Common Service Centers (CSC) facilities in 43 FPCs are some of the examples. 11 CSCs are functional as of date and able to give satisfactory profit to the FPCs.
- The Farmer Producer Companies (FPCs) in Assam are taking various steps to become sustainable in terms of business and governance. To cater to the needs of farmers, they are obtaining input licenses and setting up Input shops in their locality, generating an additional income for themselves.

**3. Market Linkage:** The FPCs are being facilitated with suitable and sustainable markets, such as local markets, wholesale markets, processors, exporters, and government procurement platforms with fair and negotiable prices. The FPCs are also being exposed to export and overseas marketing by organizing exposure and online discussions to analyze detailed market and product quality, packaging, and compliances meeting international standards and certification.



- Various Buyer Seller Meets, such as the Agri-Horti Show, Natural farming conclave, Livestock and Poultry Show, etc., are being organized to explore the scope of B2B, B2C, and B2G, generating long-term partnerships and steady demand for FPC products. Assam State Agricultural University, Jorhat, established the Agricultural Market Intelligence Unit (AMIU) under the APART project to improve the understanding of the supply and demand of the products of targeted value chains and to connect demand and supply. FPCs are also onboarding themselves in e-commerce platforms like NeML and ONDC for better linkage.



**4. Financial Literacy, Management and Access:** The FPC members need to understand the concepts of budgeting, cash flow management, financial planning, revenue generation, and investment to make rational decisions mitigating risk. APART is facilitating liaising with banks and financial agencies for credit linkages by making effective loan proposals and maintaining proper documentation to access working capital for ongoing business activities and expansion.

- Initiatives like Krisharthak (Digital Financial Literacy Programme) and Xamahar (Challenge Agriculture Fund) are helping farmers and financial partners come to a common platform and connect.
- FPCs are also availing the benefits under AIF and AAIF Schemes.

**5. Technology Adoption:** Adoption of modern farming techniques and the use of machinery and equipment can significantly improve production with efficiency, precision, and low lost labor.

- Establishment of a Custom Hiring Centre (CHC) under which different types of need-based farm machinery like combine harvesters, threshers, weeders, etc. are provided to FPCs and FIG groups has helped overcome the challenges of lack of knowledge among farmers on farm machinery. Through the CHC facility, income can be generated by renting out the machinery to the FPC shareholders, other farmers, and FPCs. Under APART, 48 FPC has received CHCs and is operational with an average net profit of Rs. 3 lakhs in the last three financial years.

Although APART has initiated multi-pronged approaches of supporting the farmers and make the FPCs sustainable in terms of business as well as governance. To enhance their knowledge and vision of channelizing towards optimum growth, continuous handholding and exposure to the FPCs are required. Both government collaboration and the private sector are equally important to back the FPCs in Assam. Farmer Producer Companies (FPCs) can represent a transformative new dimension of agriculture, offering a beacon of hope and opportunity for rural communities. Farmers now are not just mere producers and beneficiaries but also decision-makers and Agripreneurs in the journey of food security, sustainable livelihood, and overall rural prosperity.



Empowering FPCs through farm Mechanization and transport vehicles



## COMMON FACILITY CENTRES FOR ACCELERATING MSME GROWTH

- Dr Pradyut Borah,  
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The challenge of MSMEs in Assam is primarily the technology gap for quality production reducing the competitive strengths to penetrate the market. This again is due to the dearth of investment potential among the first generation entrepreneurs. To intervene in this area World Bank financed APART Project undertook a model of collective acceleration of agro based MSME enterprises in 18 districts of Assam. The focus is to bring together agro based enterprises under a common platform as Industry Association (IA) and identification of key needs of the different value chains so that intervention can be chalked out. For each of these districts Agro Industrial Development Plan (AIDP) was made which incorporated both soft and hard intervention for a horizon period.

To intervene in the technology gaps, Common Facility Centres (CFCs) are being developed with grant support from APART. These facilities are envisaged to bridge the technology gaps and provide the MSMEs jointly coming together with advanced facilities for market led productions. The model is to bring together minimum of 20 entrepreneurs of an identified value chain as shareholders of a Special Purpose Vehicle which would implement the CFCs with grant support from APART. So far 13 such CFCs has been approved under the project across 4 value chains namely, paddy (rice), mustard, fruits, vegetable & spices, sericulture (eri & muga) and are under various stages of development.



CFC for Fruits & Vegetables, Morigaon

The road to success of this model was initiated with the inauguration of 2 CFCs on 5th and 6th March, 2024 at Morigaon and Dhakuakhana respectively. The CFC at Morigaon with a total project cost of Rs.3.17 Cr is planned as an integrated facility with provisions for fruits, vegetable and spices processing. With a capacity of processing 1 MT spices and 50 kg pickles per hour in addition to a cold storage of 10 MT and pet blowing of 1600 bottles per hour, the CFC is expected to go a long way in standardizing the products of the enterprises in the districts in addition to providing an assured market to the farmers.



A total of thirty six (36) MSME entrepreneurs have come together as shareholders of the company implementing the project. The project is envisaged to promote collective acceleration in addition to benefiting these entrepreneurs at the individual level.

The CFC at Dhakuakhana, built with total project cost of Rs.4.35 Cr and capacity of processing 10 MT mustard per day is designed to produce both kachi ghani and expeller oil to cater to both the market segments. The project being located at the mustard growing belt of the state is envisaged to adequate utilization of the raw materials and at the same time creating an assured market for the farmers. This is the first of its kind facility in the district, which is expected to fill the much needed technology gap in mustard processing. Further based on the installed capacity, it is estimated that the project would positively impact more than 2000 farming families. The project would directly benefit twenty (20) MSME entrepreneurs who are into mustard processing and have come together to jointly manage and operate the project.



Oil Mill CFC, Dhakuakhana

To ensure the commercial success of the CFCs and keep the essence of CFCs intact to benefit maximum number of entrepreneurs, a hybrid model of operation has been built into the project. The CFCs would operate under a business model where products will be produced and marketed jointly by the shareholders under a common brand and also having provision for user charge model so that the facility can be used by non shareholders. This component under APART has focused on convergence of Farmer Producer Companies (FPCs) with the CFCs so that the benefit percolates to the farm level. Initiation has already been made with signing of MoUs between CFCs and the FPCs producing aligned agri commodities.

With the collective efforts of APART PCU team, Commissionerate of Industries and Commerce and technical Agency Grant Thornton Bharat LLP, the project is moving in the right direction and this model is expected to be a success story to be replicated for accelerating MSME as well as farm growth in the state.





## MULTILOCATION TRIAL- ADYNAMIC APPROACH FOR VARIETY SELECTION FOR ASSAM

- *Dr. Kasturi Goswami, Researcher*  
- *Dr. Neeraj Kumar Tyagi, Sr. Specialist, IIRI*

Assam is home to diverse flora and fauna due to its rich and varied topography. Agriculture is a dominant industry in the state, with fertile soils and plentiful water bodies. Rice is a staple crop widely cultivated in Assam, making it an important subject for continuous research to improve its yield and performance. This research ensures that the product is profitable and marketable before it reaches the farmer's field. To spread research benefits to the farmers field, several kinds of trials conducted by researchers for constitute technology verification wherein adaptability of the promising breeding lines/varieties are tested in research stations and farmers' field.

To introduce a new variety in Assam's seed systems, it is crucial to test its performance across different agro-climatic zones of the state. Therefore, varieties that are not yet released for Assam have been put under Multi Location Trials (MLT) at different Zonal Research Stations (ZRSs) and Krishi Vigyan Kendras (KVKs) located in six agro-climatic zones of the state under Assam Agricultural University (AAU), to obtain the performance data of each zone. Multilocation testing involves testing a set of rice varieties at multiple locations to predict their performance in variable soil and climatic conditions. The results of these trials are then used to decide whether to adopt and scale a new variety in a new region.

For the season Boro/early Ahu 2023-24, six stations were selected for the MLT, which includes ARRI Titabar, ZRS Lakhimpur, ZRS Nagaon, ZRS Kokrajhar, KVK Morigaon and KVK Barpeta. In these trials, 10 selected rice varieties were categorized according to their yield potential, including the most prevalent high-yielding rice varieties, Stress-Tolerant Rice Varieties (STRVs), and both flood and drought-tolerant and Premium Quality Rice (PQR) varieties.



**MLT at KVK Morigaon**



**MLT at ZRS Lakhimpur**

The selected varieties were DRR Dhan 44 and BINA Dhan 17 (Drought Tolerant & Green super Rice); DRR Dhan 69 and DRR Dhan 67 (Zinc Rich); BINA Dhan 11 and IR 64-Sub 1 (Submergence tolerant); BIRRI Dhan 69 Green Super Rice



(Low input: Fertilizer and Water); CR Dhan 310 (Protein rich); DRRDhan 55 (HYV); CR Dhan 311 (Protein and Zinc rich). These varieties were chosen based on their screening from the rice variety cafeteria performance.

The MLT testing trials are labeled with geo-tags, specifying each plot, variety, and the entire layout, for visitors to identify the variety easily and observe. These tags comprise basic information about all the varieties grown, which may not be observed directly at one point in time, such as the total duration or total yield potential. All MLT plots are managed under standard agronomic practices ensuring optimum plant expressions. The trials are laid out in such a way that all the varieties have synchronous flowering/maturity at the same time/period, achieved by staggered nursery sowing, with each variety raised in three replications.

Once the varieties reach close to the harvesting stage (grain filling completed), a participatory varietal selection field day is organized on a suitable date, inviting the participation of all key stakeholders such as agricultural scientists, extension functionaries, officials from seed certification agencies, seed dealers, millers, farmers, etc.

The evaluation process is conducted in two phases. The first phase comprises of a classroom session, where the entire idea, layout, varieties, and evaluation process are explained to all the stakeholders. In the second phase, the participants are taken to the trial field for physical evaluation, and standard evaluation scorecards are handed to each participant to assess each variety and mark the scores based on their observations. The evaluation process ends with a group presentation and sharing of their evaluation.

Scorecards (varietal performance/liking to be ranked by participants in the multilocation trial event) and the yield data of the varieties are endorsed by AAU and used for future field validation or introduction of/release of new STRVs or PQR varieties in the state. The highest-scored varieties along with high yield would be promoted through mainstream varietal programs in the state. Thus, the participatory PVs-MLT approach has provided efficient delivery of highly acceptable varieties to farmers, which directly contributes to improved efficiency of the rice-breeding program and bring that variety into a seed-multiplication system for state-wide cultivation.





## POSITIONING THE ASSAM'S PREMIUM QUALITY RICE IN THE MARKET

- *Jutika Das, Larbeen Teronpi, Project Scientist, AAU,*  
- *Dr Neeraj Kumar Tyagi, IRRI*

Recently, a breakthrough has been made in the rice sector in Assam. The International Rice Research Institute (IRRI) and Assam Agricultural University (AAU), under the Assam Agribusiness and Rural Transformation Project (APART), have analyzed the nutraceutical properties in premium-quality rice varieties from Assam, such as aromatic Joha rice, Bora, and soft rice. This analysis aims to position these rice varieties strategically in the market based on their nutraceutical properties. Joha rice is known for its sweet aroma, superfine kernel, good cooking qualities, excellent palatability, and taste. It contains a good quantity of phenolic compounds and flavonoids which are a good source of antioxidants. The aromatic rice has been given Geographical Indication (GI) status.

To familiarize participants and Farmer Producer Company (FPC) members with different grain quality traits and strategies for promoting PQR varieties based on specific grain quality parameters, a two-day stakeholder workshop on rice grain quality and nutritional profiling for market positioning of PQR Varieties was organized on March 4 and 5, 2024, by AAU, with the technical support of IRRI under APART. The workshop featured distinguished guests namely- Dr. Saurabh Badoni, Scientist, ISARC, Varanasi, Dr. Anupam Dixit, Chief Scientist, BEDF (APEDA), Modipuram, Meerut, Dr. Virendar Kumar, Resident Coordinator, IRRI, and Dr. Debananda Das, Alternate Nodal Officer, OPIU, AAU. The diverse group of participants included seed-producing FPCs, seed entrepreneurs, AAU and IRRI scientists, among others.



Stakeholders workshop on positioning Assam's Premium Quality Rice

During the technical session, Dr. Saurabh Badoni, Scientist, ISARC, Varanasi, presented a lecture on "Exploring Assam's rice traditional germplasm for premium quality varieties to benefit farmers and other rice value chain actors". He mentioned the importance of low glycaemic index (GI) content in rice and its benefits for diabetic and pre-diabetic patients. He suggested that FPO/FPC/entrepreneurs enter the low GI rice industry for business.



Dr. Amitava, Associate Scientist, ISARC, Varanasi, addressed the topic “Grain quality characteristics of selected 100 locally grown paddy varieties and market potential,” which was followed by a presentation on “Molecular authentication of premium quality rice through microsatellite genotyping” by Dr. Anupam Dixit, Chief Scientist BEDF, (APEDA), Modipuram Meerut. Dr. Dixit explained how to maintain the genetic purity of premium-quality rice during seed and grain production. He also explained the utility of molecular markers for the identification of adulterations in Basmati rice and their implementation in premium quality rice.

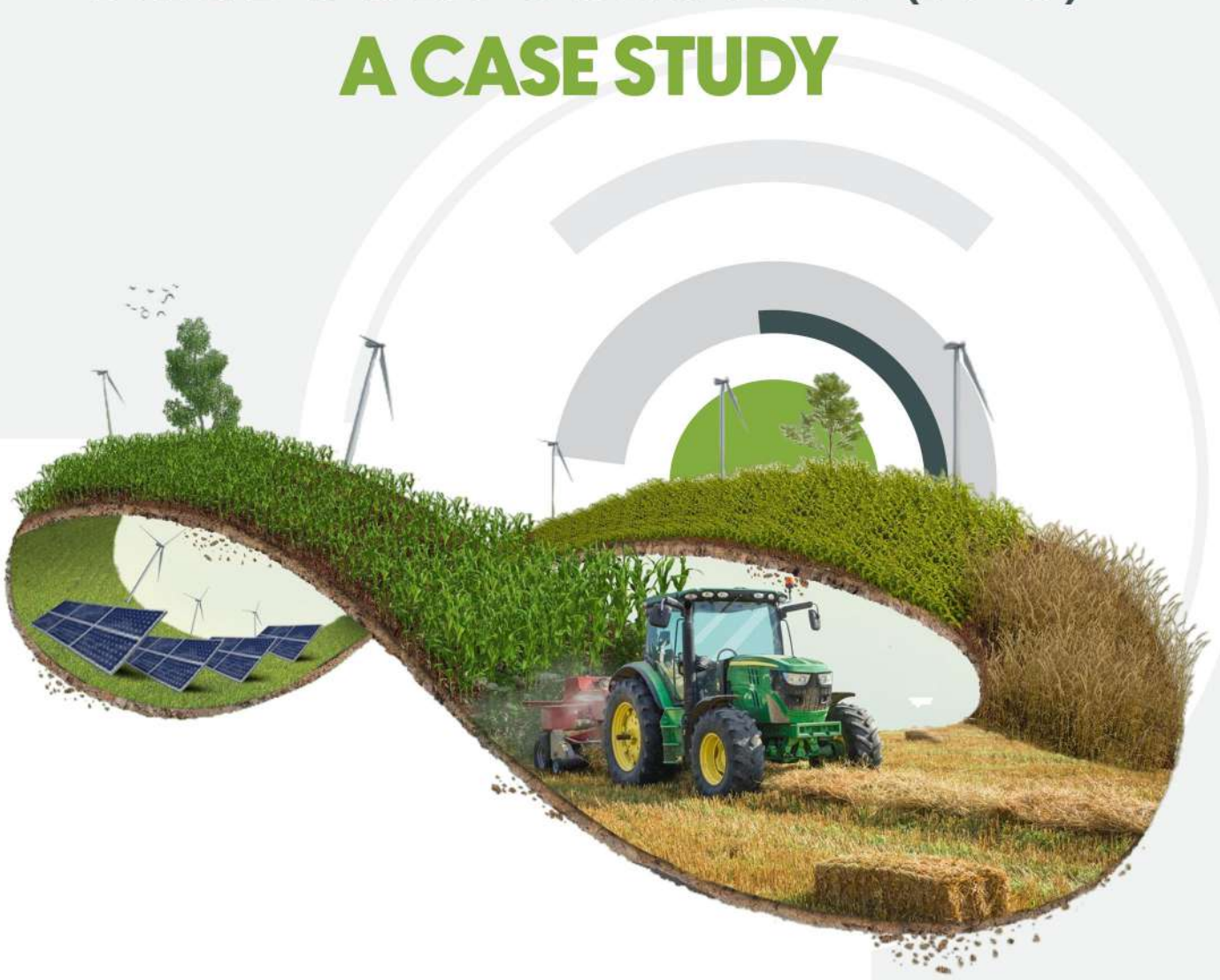
The program aimed to provide valuable insights into rice grain quality and nutritional aspects, contributing to the effective market positioning of the premium quality rice of Assam. The presentations from experts in the field of rice production and marketing and the participation of FPO/FPC members were very informative and helpful.





# PRAGATISHIL FARMER PRODUCER COMPANY (FPC)

## A CASE STUDY



### ***Introduction:***

The Pragatishil Farmer Producer Company (FPC) is a remarkable example of transformation and resilience. It was founded in Rangjuli, Goalpara, and has empowered its members while contributing significantly to the local economy. Let's delve into their inspiring journey.



***Background and Vision:***

Chairman Dristi Rajkhowa, embraced agriculture to uplift fellow farmers and create sustainable livelihoods. The FPC recognized the potential of aromatic plants, particularly lemongrass, as a game-changer for rural communities as it promised environmental benefits and increased revenues for farmers.



Capacity building of the FPC members

***Role of APART:***

With the support of APART (Assam Agribusiness and Rural Transformation Project), the FPC secured a 48-acre lemongrass demonstration plot. Additionally, APART facilitated the establishment of an oil extraction unit which allowed the FPC to process and value add of lemongrass efficiently.

***Growth and Expansion:***

With the help of APART and the Central Institute of Aromatic Plants (CIMAP), the FPC expanded its cultivation area to an impressive 105 acres. This expansion was a testament to their commitment to sustainable farming practices. The FPC's dedication to quality and innovation caught the attention of both national and international players.

***Market Linkages:***

The FPC forged strategic partnerships with companies like Flower Valley Agrotech Pvt Ltd and AromaqueenPvt. Ltd. These linkages opened doors to wider markets. Their lemongrass oil, meticulously extracted from the aromatic leaves, found buyers across borders. In a short span, they sold over 150 kg of oil.



Market Linkage initiatives taken up by the FPC



***Meeting the Demand:***

Recently, there was a surge in demand for lemongrass slips from Jaleshwar (Goalpara district), Local farmers, inspired by the FPC's success, wanted to venture into lemongrass cultivation. The FPC responded swiftly, providing quality slips and sharing their expertise. This collaborative spirit strengthened the community and fueled further growth.

***Conclusion:***

The Pragatishil Farmer Producer Company stands as a beacon of hope, proving that transformation is possible even in the face of adversity. Chairman Dristi Rajkhowa's journey from conflict to cultivation exemplifies resilience, and the FPC's success story inspires us all. As the fragrance of lemongrass wafts through Rangjuli, it carries with it the promise of prosperity and progress.

## ASSAM STATE FLORICULTURE MISSION- AN OVERVIEW

The Assam State Floriculture Mission (ASFM) aims to achieve several key objectives, including enhancing the net income of farmers with a primary focus on floriculture. The mission also aims to intensify floricultural activities through the mass adoption of protected and open cultivation of high-value flowers. Additionally, the mission aims to develop the skills and capacity of flower growers, creating opportunities for self-employment and adopting high-tech floriculture to enhance production and market competitiveness. The mission aims to achieve self-sufficiency in commercial floriculture by producing quality planting materials and generate additional income through value-added flowers.

**There are 5 (five) objectives in this mission.**

- 1: Enhancement of net income of farmers with primary focus on floriculture.
- 2: Intensification of floricultural activities through mass adoption of protected and open cultivation of high value flowers.
- 3: Development of skill and capacity building of flower growers- create opportunity for self employment for adoption of high-tech floriculture to enhance production and market competitiveness.
- 4: Self-sufficiency in commercial floriculture by production of quality planting materials.
- 5: Additional income generation by value addition of flowers

The mission has proposed area expansion from 2,200 hectare to 3,288 hectare over a period of 6 years. The ASFM is being implemented in 15 districts of Assam where Floriculture activities are going on at a small scale viz: (1) Kamrup (2) Kamrup (M) (3) Nalbari (4) Kokrajhar (5) Chirang (6) Morigaon (7) Nagaon (8) Golaghat (9) Jorhat (10) Dibrugarh (11) Sivasagar (12) Tinsukia (13) Dima Hasao (14) Karbi Anglong (15) Sonitpur covering 19075 flower growers of the state.





**The ASFM will be implementing the following components to promote floriculture in the state of Assam:**

**A. Area Expansion for Cut and Loose Flowers:** Under open cultivation, in Winter, Winter Marigold, Gladiolus, Chrysanthemum, and Lilium are being proposed for area expansion. In Summer, Summer Marigold, Lotus, and Tuberose are being proposed. Under protected cultivation, Gerbera, Orchid, Anthurium, Green Foliage plants, and Rose are being proposed.

**B. Development of Floriculture Nursery:** To produce quality planting materials, the department will develop a floriculture nursery.



**C. Post Harvest Management:** To manage post-harvest activities, the department will provide the following facilities on project & beneficiary share ratio to FPCs/Farmer groups: - Pack House, Transport Vehicles, Refrigerated Van. Value addition facilities to FPCs/farmer groups: Agarbatti units and Essential & Aromatic Oil Extraction unit.

**D. Market Linkage:** The department will provide market linkage to floriculture farmers to ensure the sale of their products.

**E. Capacity Building:** The department will provide capacity building activities to train and educate floriculture farmers.



The AFM is supported by APART (Assam Agribusiness and Rural Transformation Project). OPIU-Horticulture and FP (Farm Production) coordinate the mission for the first one and a half years. In March 2023, 20 state-level nodal officers and district nodal officers of the Department of Agriculture were exposed to IIHR (Indian Institute of Horticulture Research) in Bangalore through the OPIU-APART Cell. This was done to roll out the mission. For training and technology transfer methodology in floriculture, three officials, including nodal officer Floriculture Mission, were sent for exposure visits to KVK (Krishi Vigyan Kendra) in Howrah and Bidhan Chandra Krishi Viswavidyala (BCKV) in Haringhata, West Bengal (25-27 September 2023). During March-April 2024, Tissue culture Anthurium flower planting material of variety- Tropical/Fire/Red, Xavia/Dark purple, and Acropolis/White were planted under 51 protected structure units. Tuberose bulbs of variety- Arka prajwal, A. shinger, A.nayantara, Subhasini, Vaibhab, Calcutta double, and Subarner akha were planted in open cultivation. These were given to the flower growers.

**The plan for Tuberose in open cultivation & Anthurium in Protected structure for FY 2023-24 is as follows:**

Sl. no.	District	Nos for Tuberose in open cultivation	Protected Structure Units (nos) for Anthurium
1	KAMRUP (R)	56	12
2	KAMRUP(M)	20	4
3	GOLAGHAT	20	3
4	NAGAON	20	2
5	CHIRANG	20	2
6	DIBRUGARH	20	2
7	JORHAT	20	4
8	TINSUKIA	20	2
9	SIVSAGAR	20	2
10	DIMA HASAO	10	3
11	KARBI ANGLONG	10	3
12	KOKRAJHAR	30	4
13	SONITPUR	20	4
14	NALBARI	30	2
15	MORIGAON	10	2
	<b>Total in Nos</b>	<b>326</b>	<b>51</b>



## STRENGTHENING THE SEED SYSTEM IN ASSAM: APART INITIATIVE

- Dr. Abhinav Jain,  
Seed Multiplication Expert- APART

### *Setting up of Seed Vertical and its Purpose:*

A well-established seed sector is essential for economic growth of a nation, providing employment opportunities, enhancing productivity and improving the livelihood of farmer by generating income. In Assam, the formal seed system includes both public and private sectors while the informal system mostly includes farmer-to-farmer seed exchange. The demand for seed in the state is met by both formal and informal supply chains. However, the availability of good quality seed is a prerequisite for high production and crop productivity. Under the World Bank-funded Assam Agribusiness and Rural Transformation Project (APART), a seed vertical component was established to strengthen the seed system and augment the quality seed production in the state. The Assam Seed Corporation Limited (ASCL) is leading the seed vertical activities to prioritize the quality seed production and its accessibility to farmers at affordable price.



Seed support initiative under APART

### *Objectives of Seed Vertical:*

The following objectives of the seed vertical are to enhance the quality seed production in the state.

**Seed production and marketing:** For enhancing the quality seed production and improving the seed supply chain and marketing system.

**Strengthening seed infrastructure:** For bringing production efficiency and establishing a robust seed ecosystem.

**Training and capacity building:** For skill enhancement, training to farmers and official staffs, guidance and supervision of seed producing growers and generating operational efficiency by utilizing skilled manpower.



## STRENGTHENING THE SEED SYSTEM IN ASSAM: APART INITIATIVE

- Dr. Abhinav Jain,  
*Seed Multiplication Expert- APART*

### ***Initiatives Undertaken:***

Several initiatives have been taken with the establishment of the Seed Vertical. The ASCL is refurbishing its existing facilities through state-of-the-art infrastructural development, digitalization, training, and capacity-building measures. The ASCL has undertaken forty seed farms from the Department of Agriculture in addition to its own twelve seed farms for enhancing seed production and is planning to lease some of these farms to private entities for contract farming. Presently, foundation as well as certified seed production for key crops is being undertaken by ASCL at its seed farms. The ASCL under the brand name 'Asom Beej' is going for seed sale for wider acceptability among farmers. In a bid to provide quality seeds to maximum farmers, ASCL has started producing seed in partnership with the registered Farmer Producer Companies (FPCs). These FPCs are being involved in certified seed production with an assurance from ASCL to purchase the seed back at a minimum support price plus incentives. Technical guidance on seed production, registration and seed certification process is also provided to the FPCs, along with field monitoring and inspection visits by the officials of Assam Seed & Organic Certification Agency (ASOCA), ASCL and Directorate of Agriculture and knowledge agencies working in the state.

To showcase the improved package of practices on quality seed production (QSP), ASCL under the technical guidance of knowledge agencies such as the International Rice Research Institute (IRRI), Directorate of Rapeseed & Mustard Research (DRMR), World Vegetable Center and International Potato Center (CIP) ran a pilot program on quality seed production on diversified crops like paddy, mustard, pumpkin and potato. This program has been successfully carried out at the Dalgaon seed farm of ASCL.

Under the project, various capacity building measures, awareness creation and knowledge dissemination activities have been initiated such as specialized training for farmers and exposure visits for staff officials to various national and international institutes, manuals preparation, banners, board displays, video generation and article publications in newsletters and journals.

To transform ASCL into a financially viable entity, a consulting study viz., 'Business Process Re-engineering (BPR)' was commissioned under the project to assess the current state of ASCL, identify areas for improvement and streamlines its systems and processes. Additionally, ASOCA has also increased its capacity for registration and seed certification by adopting the online registration portal system 'Seed Authentication, Traceability & Holistic Inventory (SATHI)' and hiring additional manpower.



**Way Forward:**

Efforts are underway to formulate a state seed policy to increase agricultural production and promote a sustainable seed industry. To improve seed testing capacity, there is a need to upgrade seed testing lab facilities in the state. Additionally, some farmer producer companies (FPCs) that produce quality seeds may be supported with facilities like seed warehouses, cold storage structures and seed processing units. Crop diversification should be encouraged by providing quality seeds in diverse crops, rather than relying on mono-cropping. The seed production of premium quality rice like aromatic Joha, Red rice, Black rice, and Soft rice should also be encouraged, with exploration of export and market opportunities to strengthen the seed production business. Awareness campaigns on farmer welfare schemes, digital platforms, mobile apps, latest machinery or technological displays, crop demonstrations on promising varieties and establishment of seed banks to meet demand during natural calamities can help bring positive changes. Providing financial assistance to seed institutions can help with additional manpower deployment, resource generation and expansion of seed research, production, testing, marketing, and supply. Collaboration or close coordination among seed organizations, private growers, seed companies, national-international institutes, and other seed stakeholders on seed-related domains will help advance the seed sector in the state.





## ENHANCING PLANT NUTRIENT AVAILABILITY AND EFFICIENCY FOR SMALLHOLDER FARMERS

- Mukesh Chahar (IFDC), Rajiv Joon (IFDC) and Manabendra Deka (APART, DoA)



Fertilizer Deep Placement (FDP) technology is a cutting-edge approach to optimise crop nutrient delivery by directly placing granulated fertilizers in the root zone.

This publication highlights the interventions of IFDC under the Assam Agri-Business and Rural Transformation Project (APART) in Assam, funded by the World Bank. FDP technology involves compressing recommended fertilizers such as nitrogen (N), phosphorous (P), potassium (K), and zinc sulfate into briquettes weighing 1-3 grams. These briquettes are then placed 7-9 cm (or 3-4 inches) deep in the soil around the plant, manually or mechanically. Various applicators and machines are available for the placement of briquettes. This includes manual placement, mechanical placement, injector-type self-loaded applicators, self-propelled applicators (single and double row), and the FDP-Multi Crop Planter, which combines direct seed and fertilizer placement. In addition to this mechanical paddy transplanter with fertilizer deep placement attachments were introduced in the state of Assam for small and marginal farmers. The placement of NPK briquettes in the field is described, specifically for line-transplanted paddy and non-line-transplanted paddy. The process involves careful placement at the root zone, keeping specific distances between placement points and rows.

Under APART, IFDC conducted a number of demonstrations on fertilizer deep placement technology in different crops like – Paddy, Maize, Mustard and Vegetables (Tomato and Brinjal). IFDC with the help of APART introduced different kind of machines making the fertilizer deep placement technology easy for the small-scale farmers, these machines can be used for a number of crops (from paddy, maize, mustard, vegetables and pulses). The machines were supplied to the Farmer Producer Companies/Organizations for use of the member farmers.



The advantages of briquette application through FDP technology are significant. Farmers can achieve a 10-30% reduction in urea usage per hectare across various crops. FDP application is a one-time process during the season, leading to cost savings on fertilizer subsidies. Yield increases of 10-20% can be obtained, contributing to enhanced food security.



FDP technology demonstrated in the fields

Moreover, FDP technology helps reduce weed infestation and minimizes environmental impacts such as runoff, leaching, and gaseous losses. Additionally, adopting FDP technology creates profitable business opportunities for entrepreneurs and contributes to local economic development. To maximize the benefits, it is recommended to use FDP technology in clay-loam or loam soils alongside other required fertilizers. High-yielding varieties (HYV), pest and disease control, adequate water management, and line transplantation are also essential for achieving optimal results. Implementing FDP technology under the APART project showcases its potential to revolutionize nutrient management practices in Assam's agricultural sector. By enhancing nutrient efficiency and promoting sustainable crop production, FDP technology contributes to developing the region's agriculture.



## SUCCESS STORY OF “KAMDHENU MAHILA DUSS”, SONITPUR DISTRICT

- *Mridul Das, Astd. District Coordinator, Sonitpur,  
APART, Dairy Development*

A group of enthusiastic and dedicated women who are into dairy farming have served as an example to many other dairy farmers. Despite facing many obstacles and lacking formal dairy farming skills and techniques, they underwent a transformation journey after participating in a Milk Producer's training programme under Assam Agribusiness and Rural Transformation Project (APART) and Dairy Development Department. They have adopted new modern practices and techniques that have enabled them to achieve new heights of success and growth.

The story began with a milk producers' training organized in Thelamara, Sonitpur district from 16th August to 20th August 2022. A total of 30 female members from Teliagaon village of Thelamara, Sonitpur attended the five-day Milk Producer's training with great energy, enthusiasm, and positivity, which was a great early sign of their success in dairy farming.



Members of Kamdhenu DCS with their milk collection

Previously, the women were following traditional methods of dairy farming and had a total collection of around 100 litres of milk daily. Out of which they used to sell a portion of milk to the local market. It was a great challenge for them as they were all female producers, and this also limited their profits and earnings for their livelihood. After undergoing the producers' training program under APART, they availed technical guidance from departmental officers and enriched themselves with knowledge on the scientific rearing of cattle, which became a turning point for them. Along with scientific dairy farming and the value addition of milk, they also learned about the benefits of the formation of the Dairy Cooperative Society (DCS). They decided to form a Dairy Cooperative Society, which was a whole new concept for them and named it "KAMDHENU MAHILA DUSS".





Currently, there are 23 active members who are working wholeheartedly in the DCS. As a result of their dedication, milk production has increased significantly, and they are now collecting around 150-200 litres of milk per day. They sell a portion of the milk to PURABI DAIRY and the rest in the local market. Their monthly income is nearly Rs 1,50,000-2,00,000/-. The members maintain hygienic conditions while rearing the dairy animals, resulting in proper animal welfare and environmental cleanliness. Their success has inspired other women in the nearby areas to follow in their footsteps.



To sum up, it can be said that the training program has played a crucial and decisive role in transforming the lives of the women's group in Teliagaon. They have now established a sustainable source of income, achieved self-sufficiency through women empowerment, and are serving as a source of inspiration for others.

### EXPANDED DAIRY PLANT OF WAMUL (PURABI DAIRY) COMMISSIONED UNDER THE WORLD BANK AIDED PROJECT- APART

- WAMUL Team

Since 2008, the National Dairy Development Board (NDDB) has been managing the West Assam Milk Producers' Cooperative Union Ltd (WAMUL), also known as "Purabi Dairy". Over the years, the dairy has experienced tremendous growth. Currently, it procures around 60,000 Kg of milk per day from over 25,000 dairy farmers who are part of 800+ Dairy Co-operative Societies (DCS) across 18 districts in lower, central, and upper parts of Assam. This is a significant increase from its initial milk procurement volume of just 400 Kg per day.

WAMUL, has expanded its processing capacity to meet the growing demand for milk and milk products in the North eastern states of India. The plant's capacity has been increased from 60,000 litres to 1,50,000 litres per day. The expanded facilities now have a greater capacity for producing existing products such as paneer, curd, flavoured milk, cream, and ghee, as well as for other value-added products such as indigenous sweets and ice cream. Previously, value-added milk products accounted for 9-12% of the sales turnover, but this has now increased to 20-25%. This has resulted in higher returns for the dairy farmers associated with WAMUL, giving them a significant boost.



### *Milk procurement process*

Earlier, the dairy farmers were always under the influence of the “Paikarias” or sweet meat shop owners who bought the milk during festive seasons or whenever there was a demand and reduced their intake during non-festive seasons or periods of low demand. With the increased capacity and expansion of Milk procurement of WAMUL/EAMUL with the newly expanded Milk Processing Plant, the intervention of middleman will be reduced and the farmers will get a fair price for the milk. The Milk value realized will be credited directly to the bank account of the dairy farmers, ensuring a stable income for the farmers, besides motivating them to increase their herd size.



The expanded milk plant of WAMUL

The milk procurement process mainly depends on a transparent system for collecting, measuring, and paying for milk through the use of automatic milk collection systems installed at the dairy cooperative societies (DCSs). To maintain the quality of the raw milk brought by road milk tankers to the central milk processing plant of Purabi Dairy in Guwahati, a suitable milk chilling infrastructure with a capacity of 111,000 liters per day has been established at remote locations.

The central milk processing plant of Purabi Dairy is a crucial component in the production of freshly packaged milk and various value-added products, including paneer, curd, flavoured milk, cream, ghee, and more. Over the years, this processing plant has become the largest revenue center of WAMUL, resulting in a sales turnover of over Rs.200 crore during the financial year ending in March 2023. This is the highest revenue turnover reported by WAMUL since its inception. Furthermore, the processing plant has propelled WAMUL into the category of dairies that consistently sell a daily quantity of over 1,00,000 litres of milk and milk equivalent products.





*Expansion process*

Under the Assam Agri-Business and Rural Transformation Project (APART), WAMUL completed the capacity expansion project of its dairy processing plant for around Rs. 49 crore with the assistance of National Dairy Development Board (NDDB).

On 7th January 2022, the foundation stone for the expansion of the processing plant of WAMUL was laid at Guwahati by the Honorable Union Minister of Fisheries, Animal Husbandry and Dairying, GoI, Shri Parshottam Rupala, and the Honorable Chief Minister of Assam, Dr Himanta Biswa Sarma. The expanded plant was formally inaugurated by Dr. Sarma on 2nd March 2024, again at Guwahati, in the presence of the Honorable Minister of Agriculture and AHVD, Assam, Shri Atul Bora, the Honorable Minister of Cooperation, Assam, Smt. Nandita Garlosa, and Chairman of NDDB, Dr. Meenesh Shah.



Hon'ble Chief Minister inaugurates the expanded milk plant of WAMUL

The newly expanded milk processing plant, with a capacity of 150 TLPD under the APART project, will be a great help to WAMUL in expanding their milk procurement reach to most of the districts in Assam.





## বৰপেটা জিলাত আলুৰ এলেকা সম্প্ৰসাৰণ কাৰ্যসূচীৰ ২০২৩-২০২৪ বৰ্ষৰ এক চমু আভাস

ড° মিনছুৰা বেগম  
জিলা উদ্যানশস্য সমন্বয়ক, এপাৰ্ট, বৰপেটা

উদ্যান শস্য আৰু খাদ্য সংসাধন সঞ্চালকালয় আৰু জিলা কৃষি বিভাগ, বৰপেটা উদ্যোগত এপাৰ্টৰ অধীনত ২১৩০ বিঘা মাটিত ১১ টা কৃষক উৎপাদক কোম্পানী (এফ.পি.চি.) যথাক্রমে বৰপেটা লুইতপৰীয়া এফ.পি.চি., গোমাফুলবাৰী কৃষি কল্যাণ এফ.পি.চি., বামধেনু এফ.পি.চি., আৰ'গাই এফ.পি.চি., নৱ প্ৰয়াস এফ.পি.চি., মন্দিয়া মিলন জ্যোতি এফ.পি.চি., বেতবাৰী প্ৰগতি এফ.পি.চি., পূৰ-জনীয়া এফ.পি.চি., হাউলী এগ্ৰো ফিছ এফ.পি.চি., পছমাৰা এফ.পি.চি. আৰু সবভোগ এফ.পি.চি. য়ে আলুৰ খেতি হাতত লয়।



আলু এলেকা সম্প্ৰসাৰণ কাৰ্যসূচীৰ অধীনত "আলু চপোৱাৰ দৃশ্যাংশ

উল্লেখ্য যে, আলুৰ এলেকা বৃদ্ধিৰ লগতে একেডবা মাটিতে ধান চপোৱাৰ পিছত ছন পৰা মাটিত আলুৰ খেতি কৰি মাটিৰ সুব্যৱহাৰেৰে কাৰ্যক্ষমতা বৃদ্ধিৰ লগতে কৃষকসকলৰ আয় বৃদ্ধি কৰিবলৈ বৈজ্ঞানিক পদ্ধতিৰে উত্তম ব্যৱস্থাপনা পদ্ধতি ব্যৱহাৰ কৰা হয়। এফ.পি.চি. ৰ সদস্য তথা বৰপেটা জিলাৰ কৃষক সকলৰ মাজত উন্নত মানৰ আলু বিধান (Generation-3 Potato Tubers) আৰু উন্নত জাত (Variety) যথাক্রমে- খাদ্য সংসাধনৰ উপযোগী জাত (লেডী ৰ'জেটা, চিপ চোনা-৩) আৰু খাদ্য পাৰ্চলিৰ বাবে উপযোগী জাত (কুফ্ৰী হিমালিনী, কুফ্ৰী জ্যোতি আৰু কুফ্ৰী সূৰ্য্য) ৰ খেতি কৰি অধিক উৎপাদনৰ লগতে উপযুক্ত বজাৰ মূল্য লাভ কৰি যথেষ্ট উৎফুল্লিত হোৱা দেখা গৈছে। ইয়াৰে ভিতৰত লেডী ৰ'জেটা আৰু চিপ চোনা-৩ ৰ উদ্যোগিক চাহিদা যথেষ্ট বেছি। উন্নত জাত (Variety) সমূহৰ উৎপাদন ক্ৰমে লেডী ৰ'জেটা ১৭-৩৫.২৫ মেট্ৰিক ট'ন প্ৰতি হেক্টৰ, কুফ্ৰী জ্যোতি ২৫-৪৩.৪৫ মেট্ৰিক ট'ন প্ৰতি হেক্টৰত, চিপ চোনা-৩ ১৯-৩৮.৫ মেট্ৰিক ট'ন, কুফ্ৰী সূৰ্য্য ১৯.৫-৩২.৫ মেট্ৰিক ট'ন আৰু প্ৰতি কেজিত বজাৰ মূল্য ক্ৰমে লেডী ৰ'জেটাৰ ১২ ৰ পৰা ১৫ টকা, চিপ চোনা-৩ ১২-১৪.৫ টকা আৰু অন্যান্য জাতৰ মূল্য ১০.৫০ টকাৰ পৰা ১২.৫ টকা পাবলৈ সক্ষম হৈছে। উল্লেখ্য যে, কৃষক সকলক উন্নত মানদণ্ডৰ সংকৰণ ৩ ৰ (Generation-3 Potato Tubers) আলুৰ উৎপাদনৰ প্ৰতি লক্ষ্য ৰাখি ২৮০ কুইণ্টল আলু বিধান হিচাপে সবভোগ শীতলঘৰ আৰু বিজয়নগৰ শীতলঘৰত সংৰক্ষণ কৰিছে। ইয়াৰে পূৰ জনীয়া এফ.পি.চি. য়ে ৪০ কুইণ্টল, হাউলী এগ্ৰো ফিছ এফ.পি.চি. য়ে ৩০ কুইণ্টল, বৰপেটা লুইতপৰীয়া এফ.পি.চি. য়ে ১০ কুইণ্টল, সবভোগ এফ.পি.চি. য়ে ৫০ কুইণ্টল, গোমাফুলবাৰী কৃষি কল্যাণ এফ.পি.চি. য়ে ১১ কুইণ্টল, মন্দিয়া মিলন জ্যোতি এফ.পি.চি. য়ে ১৩৪ কুইণ্টল আৰু পছমাৰা এফ.পি.চি. য়ে ৫ কুইণ্টল আলু বীজ হিচাপে সঞ্চয় কৰি ৰাখিছে।



