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Enhancing Livelihoods through Affordable Quality Inputs: Axomagro Producer Company Limited, Goalpara

The inception of Axom Agro Producer Company Limited, a Farmer Producer Company (FPC) established at Padupara Village aspired to tackle challenges like high input costs stemming from various factors. The FPC was formed under Assam Agribusiness

and Rural Transformation Project (APART). Through consistent efforts, it was one of the first FPCs in the region to open a retail input shop, marking a significant stride towards enhancing farmer livelihoods by making quality inputs like fish feed, fertilizer, seeds,

pesticides, etc. accessible at affordable prices. This resonated with the farmers in the region, and 637 shareholders thus far have invested in the company.

Axomagro FPC, emerged at the right time to serve the farmers, focusing on empowering tribal and minority communities through Farmer Interest Group (FIG)-led bottom-up demand aggregation and strategically positioned distribution channels that

equity of around Rs 8.68 lakh, it had multiple cost and revenue streams, such as the fish seed business, live fish selling business, etc. Axomagro FPC secured a cash credit loan (CCL) of Rs 5 lakhs from Samunnati Financial Services, under the Xamahar initiative of APART, specifically to meet its working capital requirement for the input shop. The FPC immediately tied up with the digital input aggregation platform Kalgudi (also under the



provide quality, affordable inputs within easy reach. It obtained the required licenses for agri-input business in January 2023 and set up a shop by February 23, 2023. Since then, the FPC has successfully demonstrated the benefits of fostering partnerships, community support, and innovative financial strategies.

Though the FPC had its own member

Xamahar initiative) and started placing bulk orders of fish feed, seeds, fertilizers, MOCs, and other inputs on a fortnightly basis through their app. Delivery of inputs at the retail outlet is ensured by Kalgudi, and necessary coordination, stock taking, checking of material, and account keeping are done by the CEO and retail outlet attendants engaged by the FPC under the overall supervision of the Directors.

Before placing orders to the dealers through Kalgudi or directly to wholesalers, demand aggregation is done for common inputs such as fish feed, mustard oil cake, fertilizers such as urea, DAP, MOP, nano urea, etc., and seeds such as paddy and vegetable seeds, apart from lime and toximer powder. It is a crucial exercise done with the assistance of Farmer Interest Group (FIG) leaders and members spread

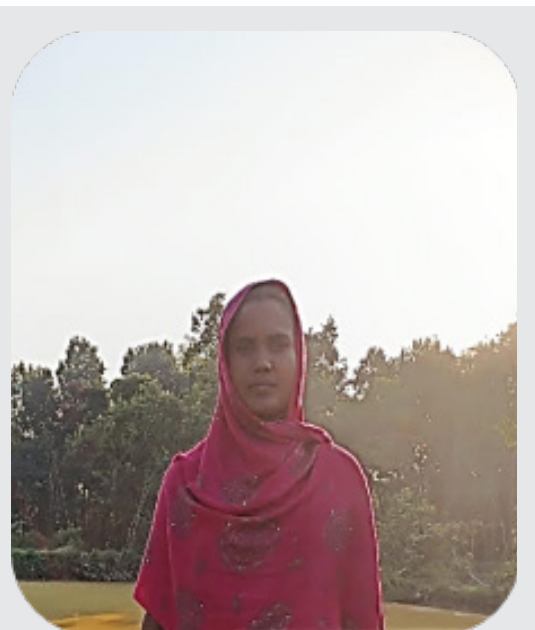
across 25+ villages. Approximation is done based on additional demand from non-members as well. Within 6 months of setting up the FPC input shop, the FPC has been able to achieve a business of Rs. 11.37 lakh with an approximate net profit of Rs. 1.98 lakh from the activity. The turnover from the input business is around 60% of the overall business turnover of the FPC so far.

Turnover Product	FY 2022-23 (In Lakhs)	FY 2023-24 (April - Sept) (In Lakhs)	FY 2024-25 (Expected) (In Lakhs)
Fertilizers	2.1	3.10	8.5
Pesticides	0.4	0.70	2.6
Paddy Seed	0.5	1.20	4.9
Fish Feed	2.1	3.20	12.5
Turnover From Input Business	5.10	8.20	28.50
Other activities	2.64	6.90	46.45
Total	7.74	15.10	75

Axomagro's journey offers valuable insights and learnings for emerging collective enterprises in Assam and the north eastern region.

"After I graduated in 2015, I became a farmer. Till February 2023, I used to buy fertilizers, pesticides, fish feed, etc. from local retailers, sometimes at a much higher MRP, due to lack of awareness and local availability. Also, our preferred brands in the required quantities were not available there. But since our FPC have taken the initiative of opening its own input shop, I could save Rs. 9,000 on average every month to cultivate my 3 bigha paddy fields, 1 bigha litchi orchard, and 2 bigha fishery ponds. It was a need of all farmers in my village, and we are excited for future initiatives of the FPC."

*~Manjuma Khatun, Progressive Farmer,
Axomagro FPC, Goalpara*



Mala Boro : An Inspirational Farmer

The story of Mala Boro will inspire many. Fighting all odds, homemaker Mala Boro earned herself a name as an independent woman. She is a resident of the Maranjana area of Kamrup district. She started her farm in 2014 with five piglets and achieved success within a short span of time. Now, she rears around 25 pigs.

A year ago, she came to know about Uttaran Krishi Producer Company, so she approached the FPC for guidance

and support on pig farming. Seeing her zeal and dedication, the FPC took her into its fold and been working together since then. Now, she is fully trained in pig health care provided by Uttaran Krishi Producer Company under the supervision of KVK KAMRUP and NRC Pig Plan. Through the FPC, she has also received feed for her livestock, minerals, a mixer grinder, a raincoat, etc. Her income at present is around Rs 50000 to Rs 100000 per annum from her piggery farms.



Mala Boro in her piggery farm

Dry DSR: Learning from the Fields

– Contributed by Jyoti Bikash Nath, Sr. Specialist, IRRI

Dry Direct Seeding of Rice (DSR) has numerous economic and environmental benefits. It reduces water usage, lowers labor and input costs, and increases the productivity of rice. A successful demonstration of Dry DSR in Musalmanpara, Kokrajhar district, has marked a significant journey for DSR in Assam. It was made possible with the collaborative effort of AAU Zonal Research Station, Gossaigaon, and IRRI under APART. There are several learnings from this demonstration that are crucial for expanding the area under Dry DSR.

Farmer Apprehension: In the beginning, the farmers in Musalmanpara were concerned about the Dry DSR demonstration and its adoption. No doubt, this was primarily due to the unfamiliarity with the technology and the potential risks associated with this new technology. There was fear of crop failure and economic losses to the family. Against all these odds, the Research Technicians (RTs) of IRRI, AAU, and experts from IRRI were able to address the apprehension by ensuring the effectiveness of the technology. With the potential benefits of Dry DSR now realized in Assam, the Research Technicians took a bold step



in convincing the farmers to adopt the new beneficial technology.

Dedicated Team: The dedicated staff of IRRI technicians monitored the field regularly and guided the farmers to strictly follow the best management practices for the paddy field. Their technical expertise and hands-on guidance played a key role in the success of the Dry DSR demonstration.

Building Trust: Trust building is the key to convincing the farmers of any new initiative. It acts as a platform for learning and cooperation. The RTs were able to address all the concerns of the farmers, who provided rigorous training, monitored regularly, and, most importantly, built trust and confidence. This led to the farmer wanting to expand his area under Dry DSR to an additional 1 hectare, over and above the area marked for demonstration.

Mechanized Sowing Of Millets For Sustainable Crop Intensification

-Contributed by Puja Rajkhowa, IRRI, Junior Researcher, IRRI

Millets are one of the oldest foods and a nutritiously rich group of cereals that have been consumed by the Indian population for years. With the recent trend in the rise of diseases among people, continuous research is being done on the consumption of nutritious foods with medicinal benefits. Millets provide people with the nutrition necessary for health benefits. In addition, millets are also hardy, drought-tolerant, and can grow in semi-arid conditions

with little or no extra inputs required for cultivation, making them an ideal choice for the resource-poor farmers of India. Millets, characterized by a short growing season, are an apt choice for increasing cropping intensity in any given area. Millets are grown in most of mainland India, in the states of Rajasthan, Uttar Pradesh, Chhattisgarh, Gujarat, Haryana, Madhya Pradesh, Maharashtra, Andhra Pradesh, Karnataka, Tamil Nadu, and Telangana.



There is a huge scope for millet cultivation in Assam, as it can fit well into the rice-based cropping system. Under APART, Assam has recorded data on millets being cultivated in many districts. One such village is Kaimari, in Dhubri district, which had been practicing millet cultivation until five years ago, when the cost of production became too high for the farmers to continue its cultivation, mainly attributed to the use of the broadcasting method for sowing. Crops grown by broadcasting demand more labor for intercultural operations, which is again a labor-intensive process. The use of machines in sowing helps reduce costs as well as increase the productivity of the crop.

On a recent visit to Kaimari village, experts from IRRI provided technical support in guiding the farmers on the use of a multi-crop planter for sowing the millet seeds. There was a drastic reduction in the cost of production, wherein millet was sown across 25 bighas of land with the help of machines hired from the nearby CHC. Dhubri district is prone to devastating floods annually, incurring major agricultural losses. Most of the farmers in this region cultivate different crops after Sali rice, thereby increasing the



cropping intensity. With mechanized sowing of millet, this has been a good farm income opportunity for the people of Kaimari for timely sowing of seeds and increasing the system productivity.

With the aim of reaching out to the masses and sharing knowledge with fellow farmers, exposure visits are planned by AAU and IRRI under APART in the upcoming months. This will help farmers experience the potentiality of adopting this cost-effective and climate-resilient technology. The success of Dry DSR in Musalmanpara, Kokrajhar district, is a prime example of what can be achieved with collaboration, cooperation, and dedication. The combined efforts of IRRI, AAU, and local farmers have not only dispelled the initial fears but also brought about a positive vibe for the technology promoted under APART in the village.

ToT Program at NIPHM

- Contributed by Dr. Silas Wungrampha, IRRI

In a transformative four-day training of trainers' program organized by Assam Agricultural University with the technical support of IRRI under APART at the National Institute of Plant Health Management (NIPHM) in Hyderabad, India, a diverse group of 18 enthusiastic participants, including 3 women, representing Framers Production Companies (PFCs), Assistant Project Scientists (APSS), Project Scientists (PSS), and Project Assistants (PAs) from Assam, converged to gain hands-on expertise in the utilization of biocontrol methods for effective pest management in plants. This event marked the occurrence of the third training of trainers program at NIPHM.

Day One: The Foundation of Biocontrol

The training commenced on October 9, 2023, with the inaugural session led by Dr. O. P. Sharma, the Director of the Plant Health Management Unit at NIPHM, who also served as the Course Director. Dr. Lavanya, the course coordinator, introduced the program's structure, emphasizing the critical role of biological control in managing plant diseases. Following this, Dr. Shailaja, the Associate Course Coordinator, provided practical insights into the preparation of Trichocards—paper strips housing Trichogramma larvae, known for their predation on stem borer larvae in rice. The hands-on training received a warm reception from participants, particularly the farmers.

Dr. Sunanda Sahu delved into the world of Entomopathogenic Nematodes (EPN), showcasing the potential of nematodes as biocontrol agents and highlighting the recent scientific advancements in their application.



Inaugural session followed by hands-on training on the production of Trichocards

Day Two: Analyzing the Agro-Ecosystem

On the second day of the training, Dr. S. Jesu Rajan delivered a lecture on agro-ecosystem analysis (AESA) and how this method serves as a tool to assess whether a field requires biological or chemical treatments for pest management. Participants learned about the importance of monitoring the pest-to-defender ratio and recognizing the need for intervention in cases where natural defenders are outnumbered by pests. Dr. Rajan took the participants to a paddy field, where they collected live specimens and photographic evidence to evaluate the field's ecosystem systematically.

Continuing the day's agenda, Dr. Lavanya instructed participants on the preparation of Enteropathogenic fungi (EPF) for controlling various pests, such as aphids, termites, grasshoppers, whiteflies, leafhoppers, and mites. The participants gained practical experience in culturing three key EPF strains—*Beauveria bassiana*, *Lecanicillium lecanii*, and *Metarhizium anisopliae*—using NIPHM's patented white media.



Participants exploring the paddy field for the Agro-Ecosystem Analysis

Day Three: Sustainability and Field Application

To explore the practical aspects of integrated farming, participants were taken to the Professor Jayashankar Telangana State Agricultural University (PJTSAU) campus, where they observed a diverse range of agricultural practices and livestock management on a single hectare of land. The farming system featured



Visit PJTSAU to learn about the Integrated Farming System.

hundreds of poultry, 60 goats, two milking cows, a biogas plant, paddy plantations, and crop cultivation, offering a holistic model for sustainable agriculture. At the farm, participants learned to prepare silage for livestock feed during the dry season, a valuable lesson for those seeking sustainability in agriculture. Upon returning to NIPHM, participants were engaged in hands-on training on vermicompost production. Dr. S. Basavaraj further demonstrated how to prepare biofertilizers using barley grains and NIPHM's white media at the field level, igniting the enthusiasm of all participants, particularly the farmers, to replicate these practices on their own farms.



Hands-on training on the mass production of vermicompost and biofertilizers

Day Four: Harnessing the Power of Nuclear Polyhedrosis Viruses (NPV)

The final day, October 12, 2023, focused on the preparation of Nuclear Polyhedrosis Viruses (NPV) at the farm level. Participants were taught how to identify insects infected with the virus and, subsequently, cultivate the virus for use in insect control. The simplicity of the process resonated with participants, and many left with newfound confidence in their abilities.

The closing ceremony was graced by Dr. Sagar Hanuman Singh, IPoS, the Director General of NIPHM, who felicitated the participants. During the valedictory session, participants shared their key takeaways from the training and their aspirations for applying their newfound knowledge. Some farmers expressed strong interest in collaborating with NIPHM for large-scale biofertilizer production in Assam. Dr. Singh engaged in a fruitful discussion and offered insights and ideas on how to address the farmers' concerns and support their ambitions. At the conclusion of the event, the Director General awarded participation certificates, marking the closure of a transformative and enlightening four-day journey.

In summary, the "Four Days of Training of the Trainers on the Use of Biocontrol for Pest Management in Plants at NIPHM, Hyderabad" proved to be a transformative experience for the participants. From learning about the significance of biological control to gaining hands-on experience in preparing various biocontrol agents, the training equipped the attendees with the knowledge and skills required to implement sustainable and eco-friendly pest management practices in their

respective regions. The commitment and enthusiasm displayed by both the trainers and farmers throughout the program demonstrated the potential for positive change in agricultural practices and a brighter, more sustainable future for farming communities.

Rice Variety Cafeteria- A Unique Platform For Evaluation & Introduction Of The Best Suitable Rice Varieties

*By Dr. Neeraj Kumar Tyagi,
Sr. Specialist, IRRI*

Rice variety cafeteria serves as an effective platform to study different aspects of the rice crop, such as the morphology, varietal differences, yield performance, and stress, to name a few. It can also be used for identifying the potential of crops and their varieties in a new geographical area and to study the different biotic stresses affecting crop performance and their identification, such as weeds, insect pests, and diseases. Furthermore, as an extension tool, it assists in the scientific evaluation and selection of new varieties by extension functionaries and farmers.

Due to Assam's unique agro-climatic conditions and its diversity with respect to altitude, land topography, and rainfall, functional rice variety cafeterias have special significance in learning crop input management.

As a trend, it has been noticed that Assam widely follows monocropping across larger parts of the state; in other words, income generation is far lower than it would have been with increased cropping intensity. The reason for monocropping can be attributed to extreme weather conditions and the



annual occurrence of devastating floods, causing mammoth losses. Therefore, in order to transform this trend, there is an urgent requirement to introduce short- and medium-duration varieties of rice.

With the APART project in action, IRRI, in collaboration with Assam Agricultural University (AAU) and the Directorate of Agriculture (DoA) Govt of Assam, has taken the necessary steps to introduce short- and medium-duration STRVs and HYVs through rice variety cafeterias in the Sali 2023 season. These varieties are evaluated in different rice cafeterias along with the other existing

long- and medium-duration varieties, and if found suitable, would be tested in all agro-climatic zones of Assam. Thereafter, the best suitable varieties will be recommended for inclusion in PoPof Assam Agricultural University. The details of the varieties are given in the table below, along with representative pictures from KVK Nagaon.

Varieties	Characteristics
Samba-Sub1	Submergence tolerance, medium slender grain, medium maturity (135-140 days)
NDR 9930111	Submergence tolerance, medium bold grain, medium maturity (135-140 days)
IR 64-Sub1	Submergence tolerance, medium slender grain, early maturity (120-125 days)
BRR1 Dhan 69	High Yielding, medium bold grain, early maturity (120-125 days)
DRR Dhan 55	High Yielding short duration, long slender grain, early maturity (120-125 days)
MTU 1224	High Yielding medium duration, medium slender grain medium maturity (135-140 days)
PR 126	High Yielding medium duration, long slender grain (125-130 days)
DRR Dhan 69	High yielding and High Zinc, long slender grain, medium early maturity (125-130 days)
DRR Dhan 67	High yielding and High Zinc, long slender grain, medium early maturity (125-130 days)
RNR 15048	Low GI, short slender grain, medium early maturity (125-130 days)

Details of the rice varieties introduced in the rice variety cafeteria

Awareness camps on Schemes under Agriculture Department under the 10 Clusters X 5000 farmers each programme

-Naveen Sagar (AMS, APART), Monalisa Hazarika (IDPE, APART)

Hon'ble Chief Minister of Assam in the Inaugural Meeting of Assam Millet Mission, directed to form 10 clusters of 5000 farmers each across the state of Assam with an objective to create awareness amongst the farmers on various Govt. Schemes and new initiatives under the Department of Agriculture, Govt. of Assam.

Accordingly under APART, ARIAS Society, 10 Clusters were identified in the 10 district, namely Lakhimpur, Nagoan, Dima Hasao, Tinsukia, Dhubri, Hojai, Golaghat, Sonitpur, Goalpara and Barpeta. A survey was conducted to identify 5000 farmer beneficiaries from each of these clusters and thereby a database of 50,000 farmers was gathered along with information on the present status of benefits availed by these beneficiaries



under different agricultural schemes. Some of the topics covered during training programs include PM Kisan, PM Fasal Bima Yojana (PMFBY), Kisan Credit Card (KCC), Soil Health Card etc., along with other interventions under the Department of Agriculture such as Millet Mission, Mustard Cultivation and Area Expansion, Enhancing Paddy Procurement at MSP, Agriculture Market Intelligence Unit (AMIU), etc.



In order to generate awareness amongst the farmers, trainings are being organised in each cluster, where resource persons from the concerned domain are making presentations on the scheme details and process of enrolment and availing benefits. Information on other interventions under the Agriculture Department is also being presented to the farmers in the local language. Audio visual Aids are also being used in these training sessions,

which are made available through online platforms <https://www.youtube.com/@apartassam> for farmers' convenience.

Till date Sonitpur, Goalpara, Dhubri, Bajali (Barpeta), Tinsukia have conducted training programs involving more than 1500 farmers. Training schedules are lined up for the month of November and December, as per the approved training calendar of the District Agriculture Offices of the identified clusters.

Seed Deterioration: Affecting Seed Quality

- Dr. Abhinav Jain, Seed Multiplication Expert, APART

Seed deterioration is a biological phenomenon. It can be described as a reduction in seed quality over time. The deteriorative changes occur in seeds due to aging, thereby increasing their exposure to external challenges and lowering their viability. It may involve physical, biochemical, or physiological changes in the seed. It is an irreversible process, i.e., once the quality of a seed deteriorates, it cannot be reversed back to a quality seed. It lowers the value of the seed. There is a loss of viability and vigor, due to which a seed is unable to germinate. There are several factors that may lead to faster seed deterioration. Hence, if these factors are taken care of, then the seed deterioration process can be slowed down.

Factors affecting seed deterioration

The seed deterioration may occur during

crop growth under field conditions or during the post-harvest period. Though there are several factors that promote seed deterioration, high humidity and temperature contribute to faster seed deterioration. Factors like drought, cold, or disease-pest-infestations may affect seed quality. Environmental stress during crop growth, like nutrient stress, moisture stress, heat stress, or a severe cold, particularly during the reproductive phase of plant growth, may affect the grain filling stage and may lead to seed deterioration. During crop maturity, the lodging of plants in wet fields (stagnant water) conditions may lead to seed deterioration. During the harvesting and post-harvesting stages, improper operations and handling during thrashing, cleaning, drying, processing, transporting, storage, etc. may lead to seed deterioration. Harvest and post-

harvest operations, any kind of mechanical damage during transportation or storage, or seed injury caused by insect or disease infestation, may lead to faster seed deterioration. Therefore, all seed-related management should be done carefully. Furthermore, due to inherent genetic factors, the rate of seed deterioration can be seed-specific. For example, as compared to orthodox seeds, generally recalcitrant seeds are short-lived, are not able to tolerate desiccation and freezing temperatures below a certain limit, and therefore need special care for storing the seed for a longer duration.

Effects of seed deterioration

There is an overall reduction in seed quality due to depletion of food reserves, changes in protein structure, the formation of adverse biochemicals, a decrease in enzymatic activity, increased respiration, etc. The effects of seed deterioration can be seed discoloration, loss of viability, reduced vigor, low germination rate, poor seedling emergence, abnormal seedling growth, and poor yield.

Remedial measures for delaying the process of seed deterioration

The seed deterioration process can be slowed down by adopting proper crop



management methods and providing safe seed storage conditions. Use healthy seeds to ensure healthy crop growth. Follow good agronomic practices like efficient pouging, seed treatment, timely irrigation, weeding, nutrient application, pest disease control, etc. At crop maturity, like in a paddy field, drain out the stagnant water twelve to fifteen days before harvesting. Avoid excessive application of chemical fertilizers and pesticides, as it reduces seed longevity and storability. Adoption of biological or organic methods for crop cultivation is very beneficial. Discard damaged, diseased, or pest-infested plants from the field and keep only healthy seed for storage and sowing purposes. For safe seed storage, ensure proper drying. Avoid storage of seeds with high moisture content and in rooms with high humidity. As seeds deteriorate faster at more than 14% moisture, limit the seed moisture content to an appropriate level for safe storage (8–12% for most crops).

34th ISSUE
OCTOBER 2023



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(An Autonomous Body of the Govt of Assam)

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Design by - Insight Brandcom Pvt. Ltd.