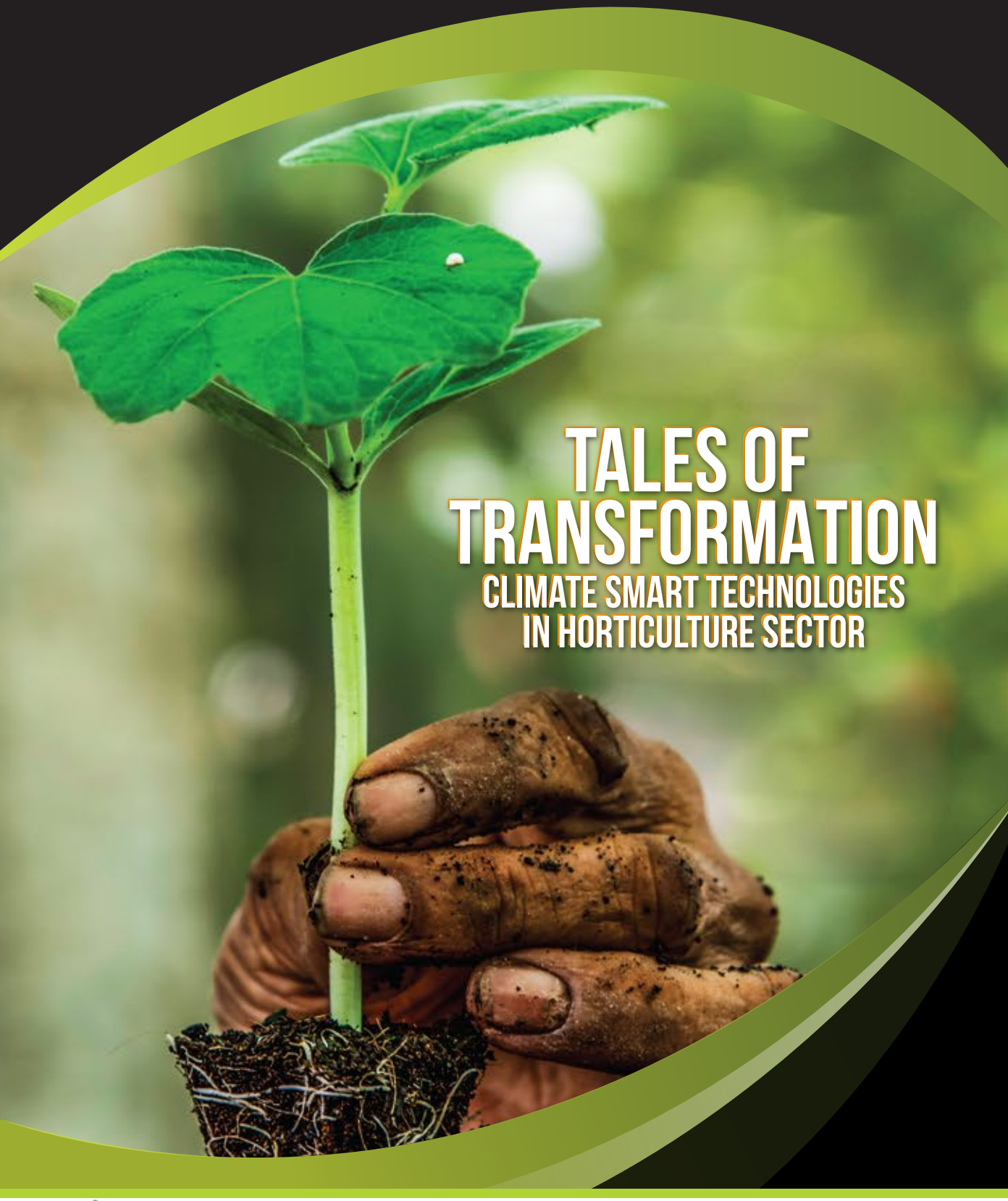

TALES OF TRANSFORMATION

CLIMATE SMART TECHNOLOGIES IN HORTICULTURE SECTOR

PKSF

IFAD

EMBASSY OF DENMARK

TALES OF TRANSFORMATION
CLIMATE SMART TECHNOLOGIES IN HORTICULTURE SECTOR

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TABLE OF CONTENTS

Preface..... 01

Building Climate Resilience in the Char through Organic Farming..... 03

Fighting Climate Change impacts with Solar-Powered Vegetable Farming..... 05

Extension of Beekeeping in Hill Tracts: A Means of Sustainable Income..... 07

Intercropping Brings Prosperity: Md. Hasmat Ali's Success Story..... 09

The Resilient Farmer of Bhola: A Story of Climate-Adaptive Agriculture..... 11

Building Resilience through Climate-Smart Vegetable Farming..... 13

Drip Irrigation: A Climate-Smart Innovation in the Hills of Khagrachhari..... 15

High-Productive and Climate-Smart Coco Dust Nursery in Joypurhat..... 17

Grafting Tomato: A Contributor to SDGs..... 19

Probiotics and Bordeaux Mixture: Environmentally Safe Pest Management in Crop Fields. 21

Climate-Smart Agriculture through Sunflower Cultivation in Saline-Prone Coastal Bangladesh..... 23

From Struggle to Sustainability: Jakir's Journey into Climate-Smart Farming..... 25

Unwavering Contribution to Maintaining Environmental Balance..... 27

Salma's Journey of Innovation and Sustainability..... 29

From Single Crop to Smart Farming: A Farmer's Journey Towards Climate Resilience..... 31

From Chemicals to Climate-Smart Cultivation: Idris Ali's Eco-Farming Journey..... 33

Moringa-Banana-Coffee Agroforestry Brings Climate-Smart Change to Sitakunda..... 35

PREFACE

Agriculture is the main engine of Bangladesh's economy and vitality. It plays a crucial role in the prosperity of a large population by increasing productivity and income and creating employment in rural areas. To meet the growing demand for vegetables in the country, farmers are resorting to the excessive use of chemical fertilizers and harmful chemical pesticides, which on one hand is destroying the soil health and the natural ecosystem's self-regulation, and on the other hand is negatively impacting environment and public health in various ways. The organic matter content in agricultural land has fallen from 5% to 0.9%. As a result, the number of microorganisms present in the soil is decreasing, and its functionality is severely compromised, disrupting the ecosystem's self-regulation. The excessive application of chemical fertilizers and pesticides in agricultural land is also increasing greenhouse gas emissions and pollution in the environment. With the support of the Palli Karma-sahayak Foundation (PKSF), a sub-project is being implemented by Amra Kaj Kori (AKK) named ``Promoting mixed and intercropping through agro-ecological farming methods in the char areas'' in Faridpur district. Through this project, assistance is being provided to farmers for the production and marketing of various vegetables, fruits, and other crops in an environmentally friendly manner.

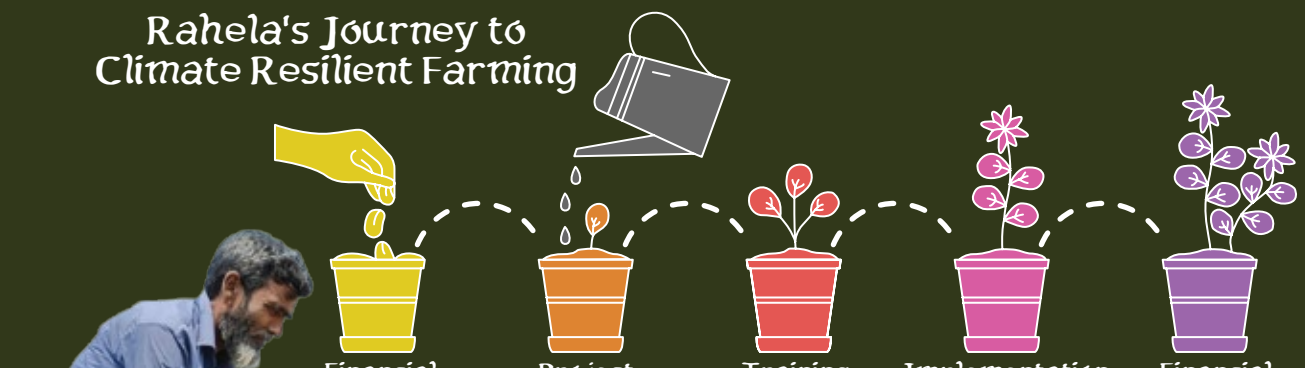
With the financial assistance of the International Fund for Agricultural Development (IFAD), Danida, and PKSF, RMTP is centrally implementing nearly 30 sub-projects in the horticulture sector throughout the country. Through this project, various technologies are being disseminated at the farmers' level to protect the environment and to address the adverse effects of climate change in the horticulture sub-sector. I express my gratitude on behalf of the organization to all Partner Organizations (POs), including PKSF, for being able to publish a book compiling 16 success stories by selecting environmentally friendly technologies from various ongoing sub-projects across the country.

I sincerely congratulate and thank everyone involved for the publication of the book titled 'Tales of Transformation: Climate smart Technologies in Horticulture Sector, which accounts the success of about 16 technologies related to environmental and climate resilience under RMTP initiative. I believe this book will help project members and other farmers learn about environmentally and climate-resilient technologies and inspire them to use these technologies on their own farms.

M. A. Jalil
Executive Director
Amra Kaj Kori (AKK)
Faridpur

Building Climate Resilience in the Char through ORGANIC FARMING

Rahela's Journey to Climate Resilient Farming



Financial Struggle
Facing climate crisis losses

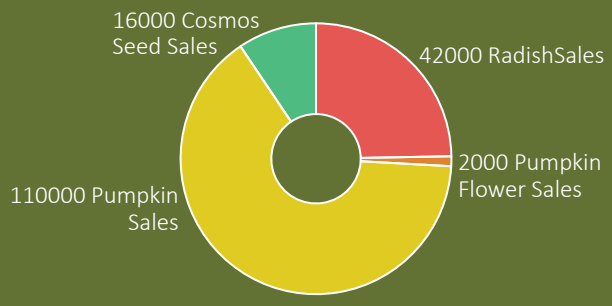
Project Launch
Joined ECO initiative project

Training Received
Learned eco-friendly farming practices

Implementation
Cultivating with organic methods

Financial Stability
Self-reliant, climateresilient future

Rahela Begum's Income Sources (December 2025) (Tk)



Rahela Begum (48), a resident of Dikrir Char Union under Faridpur Sadar Upazila, lives with her husband and four children. Her family was struggling financially, especially after losses from maize cultivation, which was increasingly affected by erratic weather and declining soil fertility — signs of the worsening climate crisis.

In July 2024, new hope arrived with the launch of the project "Safe Vegetable Production and Marketing through Mixed and Intercropping in Agroecological Farming in Char Areas" under the ECO initiative. Rahela joined as a participant and later became a lead farmer, receiving training on climate-resilient, eco-friendly farming practices adapted to char ecosystems.

She learned about organic vegetable production, restoring soil health, mixed cropping, organic pest control, and the use of trap and border crops. “After the training, I realized this approach could protect both our health and income,” she says.

In December 2025, she began cultivating sweet pumpkin on 5 bighas of land using compost, cow dung, and biopesticides. She also planted radish as a companion crop and cosmos flowers as trap crops. Supported by a Tk. 5,000 demonstration grant, Rahela earned Tk. 42,000 from radish in just 32 days and Tk. 2,000 from male pumpkin flowers — a new source of income from previously unproductive land.

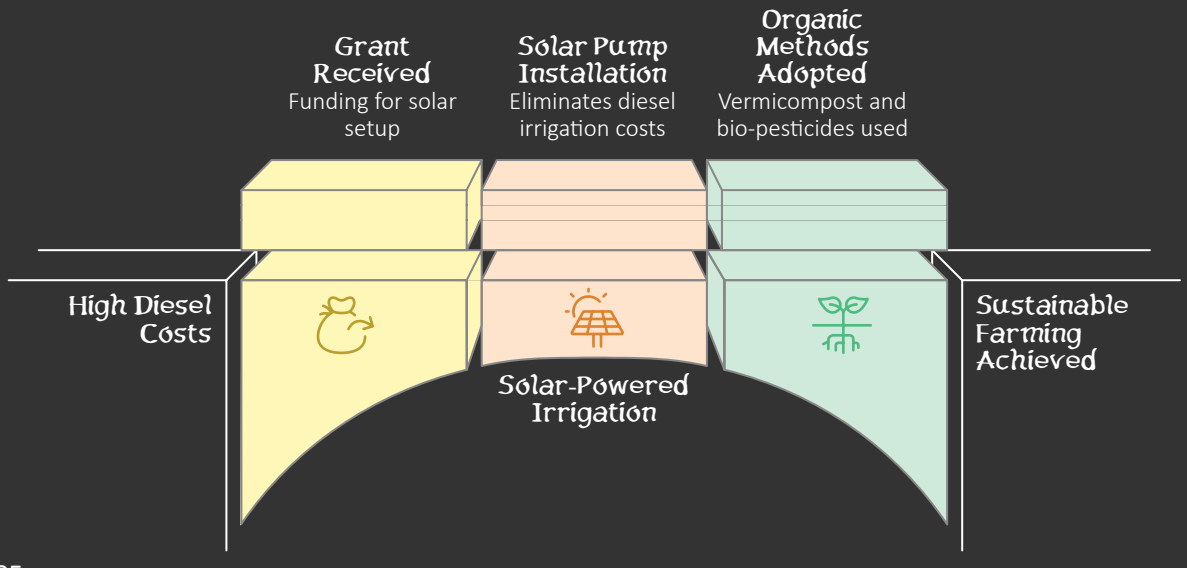
Her total pumpkin yield brought in Tk. 110,000 with a profit of Tk. 60,000 after expenses. Additionally, she earned Tk. 16,000 from cosmos seeds. Selling safe, chemical-free produce fetched premium prices at local markets and safe food outlets.

Rahela also observed the return of frogs and myna birds — natural pest controllers — after years of absence. “Nature is restoring its balance,” she says proudly. She believes this model can lead char communities toward a self-reliant, climate-resilient future.

Faridpur Sadar Agriculture Officer Mr. Anwar Hossain adds, “Thanks to the ECO project, organic farming is gaining ground. I thank PKSF, IFAD, and DANIDA for their support.”

Fighting Climate Change impacts with SOLAR-POWERED VEGETABLE FARMING

Solar Irrigation for Sustainable Farming



In the remote char areas, high diesel costs make vegetable cultivation increasingly expensive and unsustainable. Recognizing this, the AKK-PKSF RMTP project piloted solar-powered irrigation to reduce reliance on fossil fuels and support climate-resilient farming. Model farmer Delowar Hossain Khan, known as Delu Khan, from Bepari Dongi Char in Faridpur Sadar Upazila, was selected to demonstrate this innovation.

With support from the project, Delu received a BDT 100,000 grant and invested BDT 30,000 of his own to install solar irrigation. Since then, he has been cultivating vegetables across 165 decimals of land without spending on diesel. From January to June, he grew sweet pumpkin, spinach, colored cabbage and cauliflower, cucumber, tomato, carrot, and more—all irrigated using solar power.

The solar pump not only cut his irrigation costs to zero but also enabled him to provide water to neighbors, earning BDT 2,300. Delu adopted fully organic methods—using vermicompost, homemade bio-pesticides, and his own seeds. “Before, diesel and chemical fertilizers raised my costs,” he said. “Now, I farm sustainably and profitably.”

Thanks to continuous moisture, his crops thrive even during dry spells, making them healthier and more marketable. Birds have returned to his fields, feeding on pests and restoring ecological balance. “This method keeps the environment alive,” he says.

Previously, he used 200 liters of diesel costing BDT 21,800, but now irrigation is just a switch away. Delu is also part of the RMTP value chain sub-project promoting safe, agroecological farming.

Delu hopes this climate-smart model will transform his char area into a self-reliant, environmentally resilient union. “Agroecological farming reduces costs, increases profits, and protects the planet. We are proud to lead the change.”

Faridpur’s Deputy Director of Agriculture praised this solar-powered initiative as a first-of-its-kind success in the region.

Extension of Beekeeping in Hill Tracts: A Means of SUSTAINABLE INCOME

Kala's Journey to Beekeeping Success

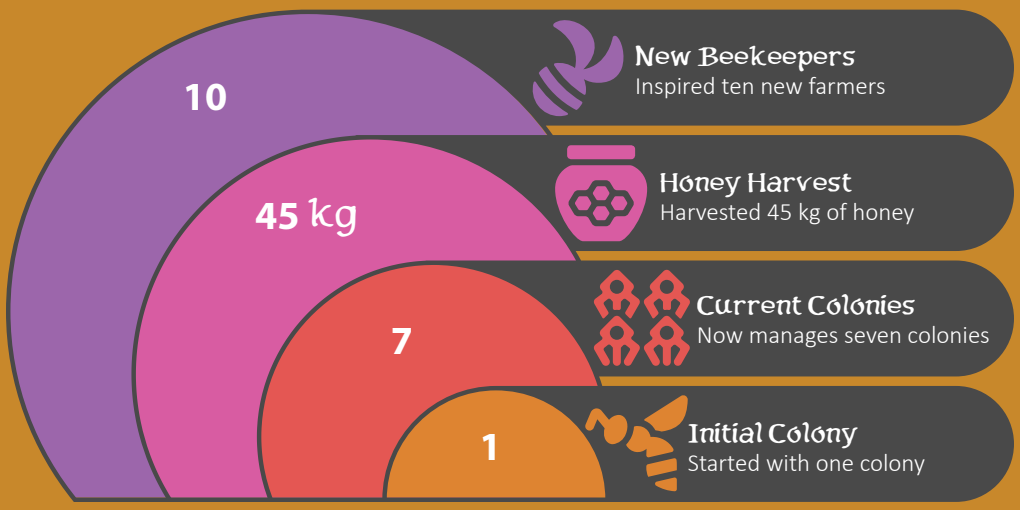
Kala receives beekeeping training and starts with a wild bee colony
2012

Kala joins the "Sustainable Beekeeping Development" project
May 2024

Kala buys a bee colony for 2,000 taka
September 2024

Kala harvests 45 kg of honey, earning BDT 54,000
January-June 2025

Kala's Beekeeping Journey in Tebhangchara



Tebhangchara is a remote village in Boalkhali Union of Dighinala Upazila, Khagrachhari. Kala Ranjan Chakma, a local farmer, lives there with his wife and son. In 2012, he received beekeeping training from a local NGO and began with a wild bee colony. His dream was to produce pure honey for his family and relatives. But due to limited knowledge, he couldn't sustain the colony for more than a year, and his dream faded.

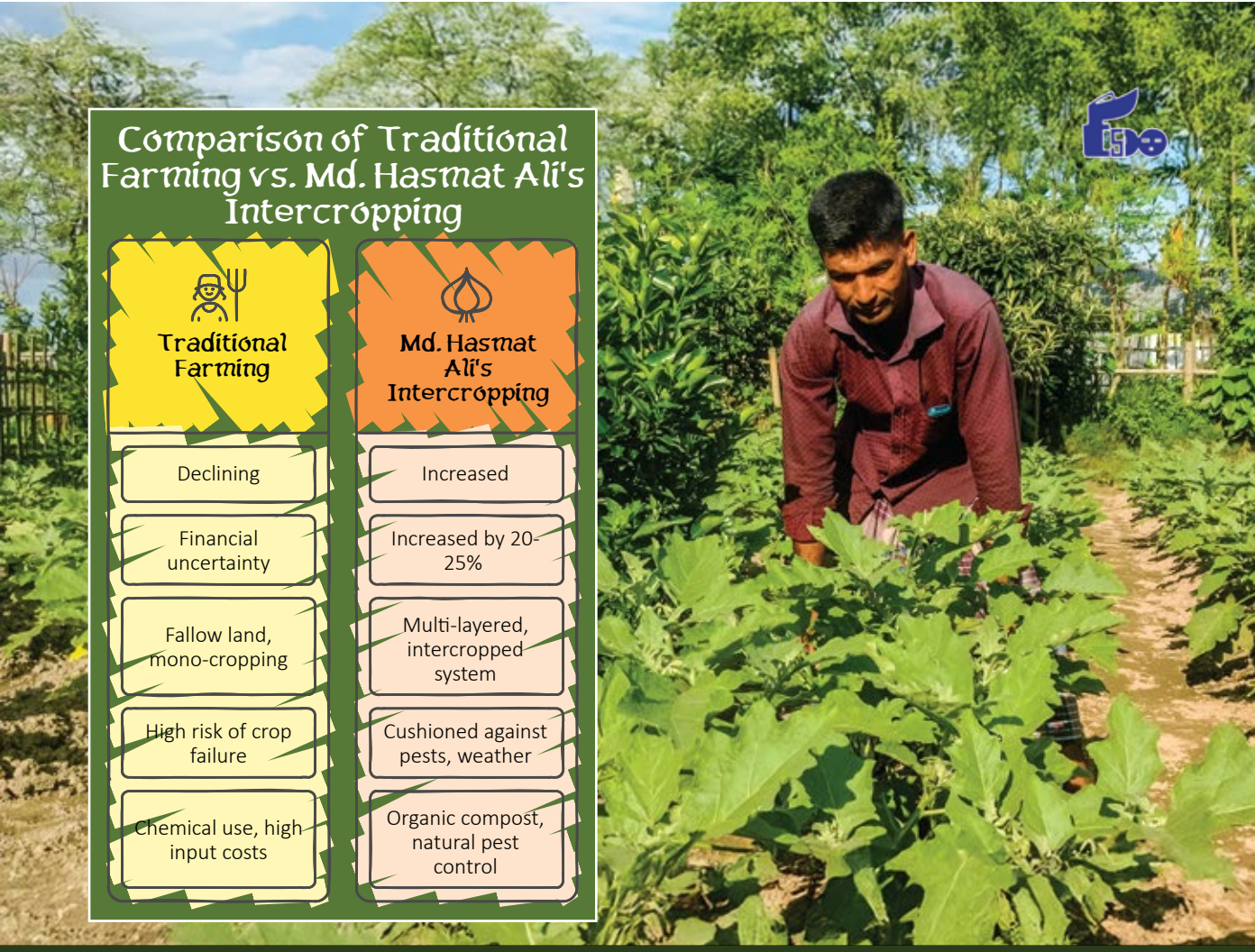
In May 2024, Kala was included in the "Sustainable Beekeeping Development" sub-project by BASA Foundation, supported by PKSF, IFAD, and DANIDA under the Rural Microenterprise Transformation Project. He received training on safe honey production, modern beekeeping, queen bee breeding, processing, marketing, online sales, packaging, pricing, and branding. The project also provided essential equipment like bee boxes, refractometers, and honey extractors.

With this support, he bought a bee colony for 2,000 taka in September 2024 and restarted beekeeping. He now breeds queen bees using the division method and manages seven colonies.

Previously, Kala extracted honey by chewing combs and stored it in plastic bottles, leading to poor quality and waste. Now, he uses stainless steel extractors and automatic machines to process and store honey in glass bottles. He sells it both directly and online under the brand "Dighinala Pure Honey House."

From January to June 2025, he harvested 45 kg of honey, earning BDT 54,000. Proper storage preserved its quality, earning consumer trust. He also supplies queen bees at low cost, encouraging others in the area. Inspired by his success, 10 new farmers have started beekeeping. He helps them with hive setup, care, and honey processing.

Now self-reliant, Kala meets his family's needs, earns more, and enjoys greater community respect. He is deeply grateful to PKSF and BASA Foundation for turning his dream into reality.



Comparison of Traditional Farming vs. Md. Hasmat Ali's Intercropping

Traditional Farming	Md. Hasmat Ali's Intercropping
Declining	Increased
Financial uncertainty	Increased by 20-25%
Fallow land, mono-cropping	Multi-layered, intercropped system
High risk of crop failure	Cushioned against pests, weather
Chemical use, high input costs	Organic compost, natural pest control

Md. Hasmat Ali's Success Story: INTERCROPPING BRINGS PROSPERITY

Intercropping for Sustainable Farming

Declining Farm Yields
Low income, financial uncertainty

Implement Intercropping

Increased Farm Income
Productive, eco-friendly, stable farm

- Multi-layered, intercropped system created
- Plant brinjal, spinach, onion, garlic
- Lemon and moringa plant fences
- Compost, natural pest control

In the village of Sarialjot, Tetulia, where leaving land fallow was once the norm, Md. Hasmat Ali introduced a game-changing approach—intercropping. For years, farmers faced declining yields and financial uncertainty, but Hasmat envisioned a solution that would bring both productivity and ecological balance.

He redesigned his farmland into a multi-layered, intercropped system. Rows of loquat and orange trees formed the upper layer, offering shade and structure. Beneath them, he planted brinjal, and on the ground level, puishak (Malabar spinach) thrived. Hasmat also added onion and garlic for seasonal income and preservation. Even his fences were functional—lined with lemon and moringa plants, adding to both his harvest and income streams.

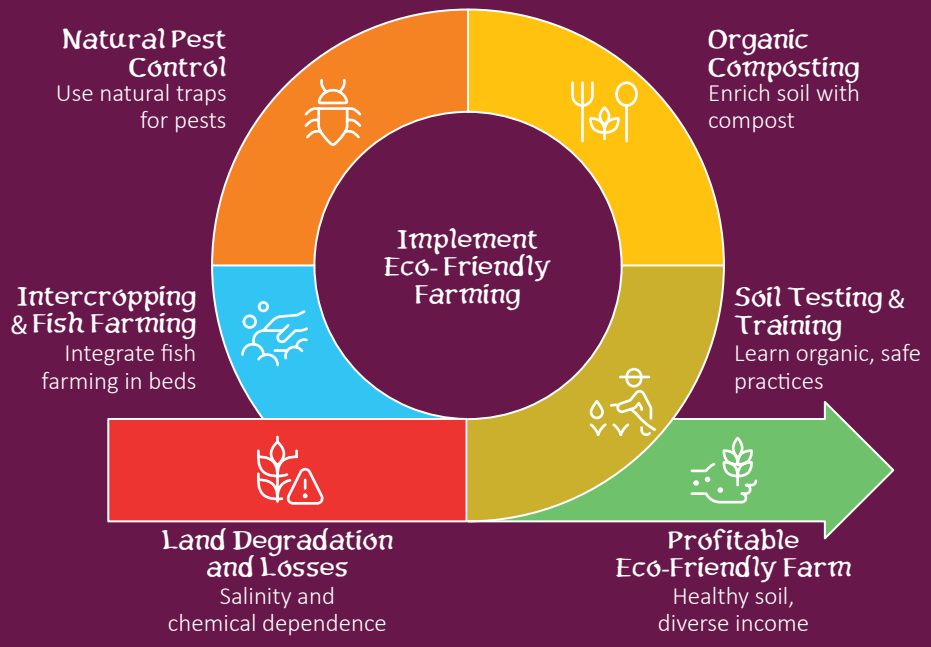
This system allowed year-round production: puishak every two weeks, regular harvests of brinjal, and high-value fruits like loquat and orange over time. Within just two years, Hasmat's income increased by 20–25%, a significant leap from traditional mono-cropping methods.

More than just profitable, his farm became resilient. The crop diversity cushioned against pests and extreme weather, reducing crop failure risks. Soil moisture improved naturally through layered vegetation, cutting down on irrigation. Hasmat embraced organic compost and natural pest control, minimizing chemical use and input costs. This approach not only protected groundwater but also boosted biodiversity and soil health.

Md. Hasmat Ali's farming model is a powerful example of Climate-Smart Agriculture. By blending tradition with innovation, he has built a productive, eco-friendly, and financially stable farm. His success provides an inspiring and practical model for other smallholder farmers striving for sustainability and improved livelihoods.

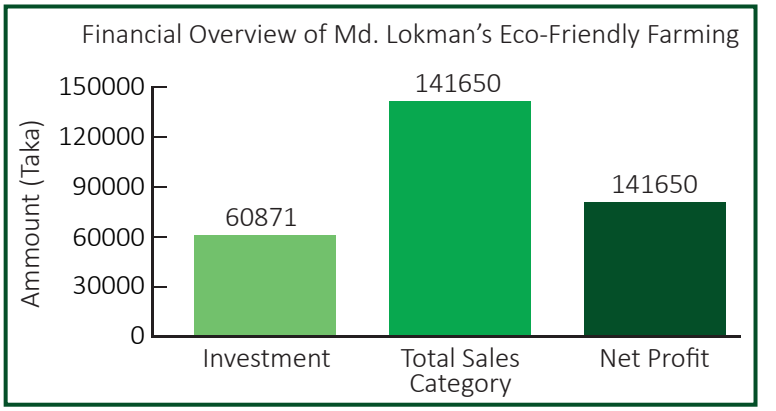
The Resilient Farmer of Bhola: A Story of CLIMATE-ADAPTIVE AGRICULTURE

Eco-Friendly Farming Restores Profitability



The salty breeze carried the scent of the Bay of Bengal—a constant reminder of both life and danger in Bhola, Bangladesh's only island district. In Char Fasson, farmer Md. Lokman, hardened by twelve years in the fields, knew the growing threat of climate change all too well.

His 80-decimal land, once fertile, now battles waterlogging, drought, and creeping salinity. The Sarjan method gave temporary relief, but chemical dependence pushed costs up and soil health down. Despite abundant harvests, low market prices and environmental damage left Lokman trapped in losses.



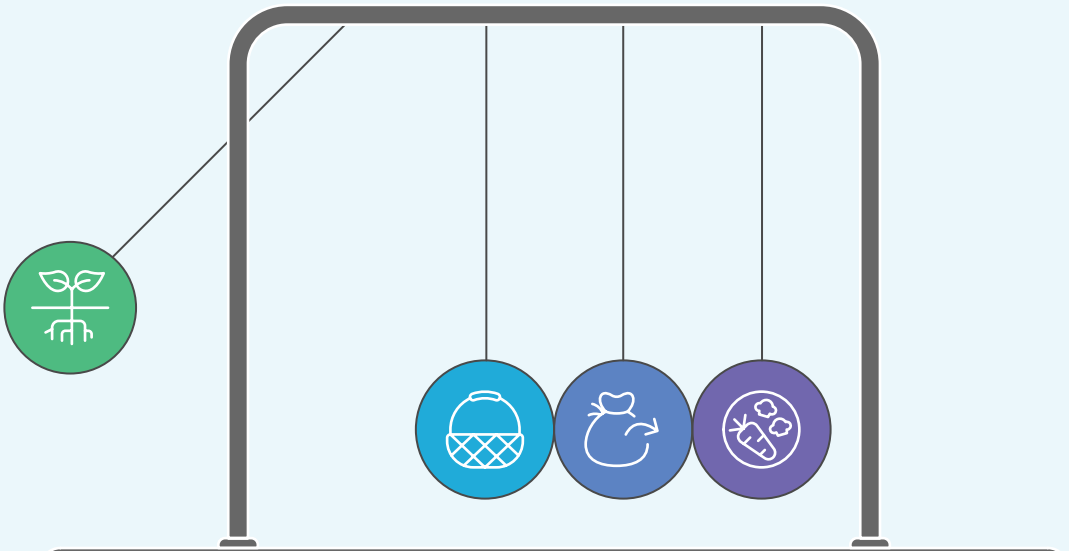
In February 2022, hope arrived through a new PKSF, IFAD and DANIDA-financed sub-project on 'Eco-friendly Safe Vegetable and Crop Production and Marketing'. Skeptical yet desperate, Lokman joined trainings on soil testing, Good Agricultural Practices, an d organic practices. He learned composting, pest control with natural traps, and intercropping with fish farming in Sarjan beds. It felt like a return to roots—traditional wisdom enriched by modern science.

Lokman returned to his land with purpose, reshaping Sarjan beds and deepening trenches for fish farming. He enriched the soil with organic compost, replacing chemicals with care and hard work that healed. Tomatoes, bitter gourds, and yard long beans flourished; fish thrived, nourishing both soil and income. The market embraced his safe produce with higher prices, rewarding his eco-friendly efforts.

Lokman spent 60,871 Taka on eco-friendly farming, including bio-inputs and fish fingerlings. His total sales reached 141,650 Taka, earning him a net profit of 80,779 Taka. He proudly shared how shifting from chemicals to ecological practices turned his land profitable.

Md. Lokman's eco-friendly Sarjan method showcases Climate-Smart Agriculture by ensuring profit through lower costs and diverse incomes, building resilience to climate stresses, and reducing environmental impact through minimal chemical use and improved soil health.

Building Resilience through CLIMATE-SMART VEGETABLE FARMING



Agriculture in northern Bangladesh is increasingly threatened by climate change. Irregular rainfall, extreme heat, and prolonged droughts are disrupting traditional farming and affecting smallholders' livelihoods. To address this, Gram Bikash Kendra (GBK) launched the “Ecology-Friendly Safe Vegetable and Crop Production and Marketing Value Chain Sub-Project”, promoting climate-smart, high-value vegetable cultivation.

Bikas Chandra Roy, a 48-year-old farmer from Tajnagar Kumarpara village in Monmothpur Union, Parbatipur, Dinajpur, is one of the project’s success stories. Once reliant on paddy and wheat, Bikas struggled with rising costs and declining yields. In 2024, he joined the GBK initiative and received training and support to transition into sustainable vegetable farming.

He began cultivating crops like capsicum, Chinese cabbage, beetroot, bitter gourd, and broccoli using advanced techniques such as coco-dust seedlings, mulching films, IoT devices, and organic fertilizers. “Coco-dust seedlings are more drought-tolerant and disease-resistant,” Bikas explained. “Soil testing helped optimize fertilizer use, reducing production costs by 12–15%. Mulching films cut labor costs by up to 50% and irrigation by 20–25%.”

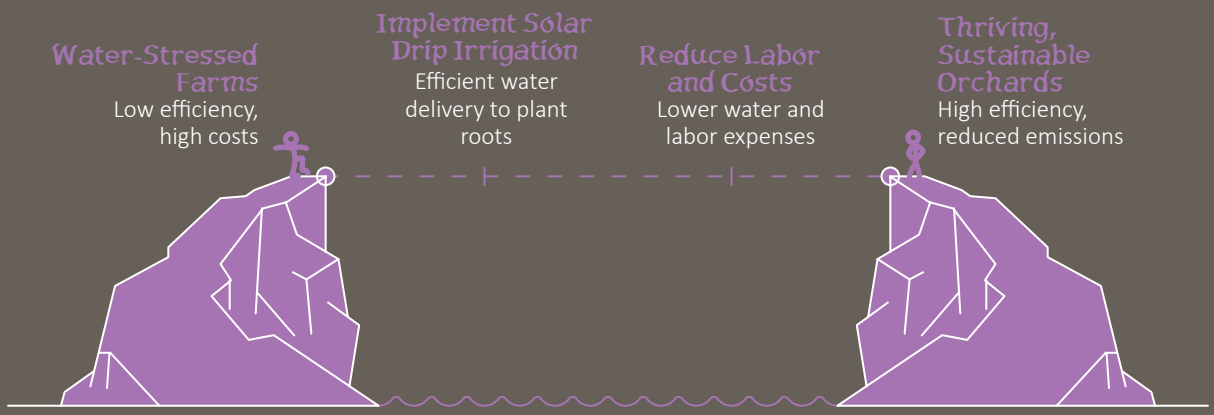
This past season, Bikas used climate-smart inputs across 120% of his land, increasing yields and income by 10%. Tools like polyhouses and organic pesticides further improved soil health and water management.

“Just a few years ago, we only grew eggplant and chili,” he said. “Now, with support from RMTP and local nursery entrepreneurs through GBK, we can easily access coco-dust seedlings, Trichoderma, and other inputs. That’s made sustainable, diversified farming possible for us.”

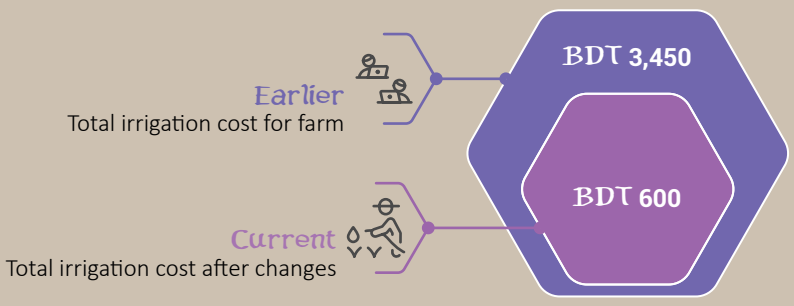
This story shows how climate-smart agriculture can empower farmers to adapt to climate change, improve livelihoods, and build a more resilient farming future.

A Climate-Smart Innovation in the Hills of Khagrachhari:
DRIP IRRIGATION

Transforming Agriculture with Solar Drip Irrigation



Suni Tripura's Irrigation Cost Reduction



Matiranga upazila in Khagrachhari district is one of the high-temperature-prone areas in the Chattogram Hill Tracts. In recent years, rising temperatures and loss of soil moisture have severely impacted fruit and vegetable production in this region. To combat these challenges and ensure sustainable agricultural growth, the RMTP sub-project on high-value fruit and crop cultivation, supported by PKSF and implemented by the Integrated Development Foundation (IDF), has introduced solar-powered drip irrigation systems as a climate-resilient solution.

Among the pioneers of this technology in Matiranga is Suni Tripura, a local farmer who has experienced firsthand the transformation that this system brings. Through timely and efficient water delivery directly to plant roots, the drip irrigation system has significantly improved moisture-use efficiency, increased yields, reduced dependency on labor, and most importantly, cut down carbon emissions by replacing diesel pumps with solar energy.

Positive Changes at a Glance:

Indicator	Before Solar Drip Irrigation	After Solar Drip Irrigation	Key Impacts
Irrigation Water Cost	BDT 52,500	BDT 30,000	Reduced production cost, improved productivity
Labor Cost	BDT 100,000	Negligible	Minimal labor needs, cost savings
Environmental Impact	Air pollution, soil degradation	Eco- friendly, balanced ecosystem	Lower emissions, healthier soil, sustainable farming
Energy Source	Diesel (fossil fuel)	Solar (renewable)	Zero carbon emissions from irrigation
Farmer Sentiment	Discouraged due to high costs	Encouraged, expanding farming	Greater enthusiasm and adoption among nearby farmers

Suni Tripura shared that earlier, irrigating his land required two workers over two days, using 7–8 tanks of water. Now, with the solar-powered drip system, he manages irrigation himself using just 4 tanks, completing the task in a single day. His water cost per irrigation has dropped from BDT 1,050 to BDT 600, and labor costs from BDT 2,400 to zero- bringing the total irrigation cost down by nearly 80%.

The benefits have not gone unnoticed. Neighboring farmers, inspired by Suni's success, are now eager to adopt this system in their own orchards. They see it not only as a cost-saving tool but as a sustainable practice that addresses the climate challenges facing the region.

High-Productive and Climate-Smart
COCO DUST NURSERY IN JOYPURHAT

Comparison of Traditional vs. Coco Dust-Based Seedling Production

Characteristic	Traditional Seedling Production	Coco Dust-Based Seedling Production
Productivity	200,000 seedlings/year	3 million seedlings/year
Income	BDT 10,000 monthly	BDT 1 million monthly
Resilience	High seedling mortality	Disease-resistant, moisturere-gulating
Environmental Impact	Chemical inputs, polyethylene	Organic, biodegradable materials

Joypurhat, famously known as the "winter vegetable district" of Bangladesh, plays a essential role in national vegetable production. However, changing rainfall patterns and climate-induced stresses—such as excessive moisture, seedling root rot, and disease outbreaks—have significantly disrupted traditional seedling production. Farmers struggled with declining seedling quality, increased dependency on chemical fungicides, and rising costs, leading to a less resilient and environmentally harmful agricultural system.

Under the RMTP sub-project titled “Ecology-Friendly Safe Vegetable and Crop Production and Marketing”, the JAKAS Foundation introduced an innovative, climate-smart solution: structured coco dust-based nurseries. Among these, Beli Krishi Seba, led by Easir Arafat in Atapara, Panchbibi upazila, became a model of transformation. Trained by the Department of Agricultural Extension, Arafat replaced soil and polythene-based practices with coco dust seedbeds and reusable seedling trays.

This transition aligned with all three pillars of Climate-Smart Agriculture (CSA):

- **Productivity:** The new method drastically increased seedling production from 200,000 to 3 million per year and reduced seedling mortality. Farmer incomes rose from BDT 10,000 to nearly BDT 1 million monthly.
- **Adaptation:** The coco dust medium, being disease-resistant and moisture-regulating, helped farmers adapt to erratic rainfall and root-borne diseases. The model also promoted rural employment, including women, in nursery operations.
- **Mitigation:** By replacing chemical inputs and polyethylene with organic and biodegradable materials, greenhouse gas emissions and soil pollution were significantly reduced.

Now reaching customers across 10 districts and more than 2,500 distant buyers, this climate-resilient model exemplifies how eco-friendly innovation can build a profitable and sustainable agri-business in the face of climate change.

Grafting Tomato:
A CONTRIBUTOR TO SDGS

Grafting transforms tomato farming in Kamalganj, ensuring sustainability

High mortality, low yield

High yield, climate resilience

In the scenic Kamalganj upazila of Moulvibazar, summer tomato farming is both a tradition and a vital source of income. However, unpredictable rainfall—around 2000 mm annually—makes tomato seedlings vulnerable to root rot and disease. Farmers often rely heavily on chemical fungicides, increasing production costs and harming the environment.

To address this, grafting has emerged as a climate-smart solution. By grafting tomato plants onto disease-resistant rootstocks, farmers can protect their crops from abiotic stress like drought and salinity. Gazi Moinuddin of Adampur Union, trained by the Department of Agricultural Extension, has led this transformation through his Gazi Nursery, which specializes in grafted tomato seedlings.

Innovatively, the PKSF, IFAD and DDANIDA supported RMTP project has introduced the use of coco dust in seedling trays instead of polythene bags, reducing environmental impact. This eco-friendly shift has significantly improved outcomes:

- **Productivity:** Grafted tomatoes yield 50% more with 80% lower seedling mortality—boosting farmer income by over 20%.
- **Adaptability:** Nearly every farmer in Kamalganj now adopts this method. Remarkably, over 5,000 women are employed in local nurseries, driving social inclusion.
- **Mitigation:** Using coco dust has cut polythene use by 20%, lowering greenhouse gas emissions and pollution.

Through this initiative, Patakuri Society, with support from PKSF, directly contributes to SDGs goals 2, 8, 12, 13 and 15 (Zero Hunger, Decent Work, Responsible Consumption, Climate Action, and Life on Land). Grafting tomatoes isn't just smart farming—it's a step toward sustainable development and climate resilience.

Probiotics and Bordeaux Mixture: Environmentally

SAFE PEST MANAGEMENT IN CROP FIELDS

Ismail's Nursery Financial Transformation

In Vatsala union under Sherpur Sadar upazila, more than 30 small and medium nurseries thrive amidst nature's harmony. Among them is Nurjahan Nursery, owned by Mr. Ismail Hossain (46), who has nurtured 150 decimals of land since 2004.

For years, Ismail struggled with severe pest and disease infestations, causing quality loss and raising his pest management cost to over 25,000 BDT per month. To maintain plant health, he also spent another 5,000–10,000 BDT monthly on chemical fertilizers. Despite these investments, sapling quality remained inconsistent.

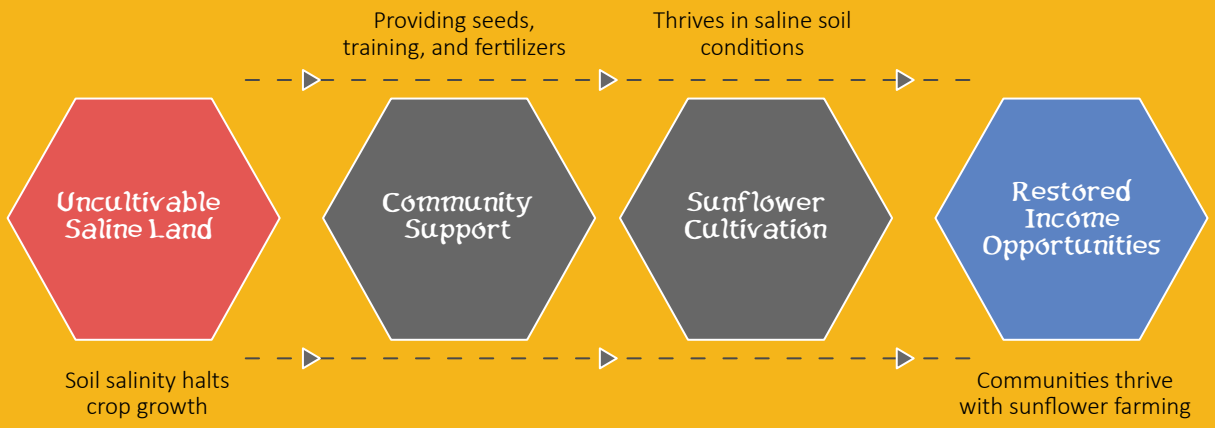
A turning point came when Ismail was selected as a beneficiary of the RMTP under PIDIM Foundation. He received training on mother stock management, sapling propagation, and eco-friendly farming. Through this training, he was introduced to probiotics and Bordeaux mixture—environmentally safe alternatives to synthetic pesticides.

Motivated and equipped with new knowledge, Ismail began using these solutions immediately. Within days, he noticed a remarkable reduction in pest infestation. Monthly pest control costs dropped to just 1,800 BDT—a 93% decrease. Simultaneously, his nursery income rose from 400,000 BDT to 420,000 BDT per month, a 5% increase. The net result: a monthly profit boost of 43,200 BDT.

This transition demonstrates how climate-smart pest management using biopesticides not only protects the environment but also ensures long-term sustainability. By reducing chemical inputs, enhancing soil health, and lowering greenhouse gas emissions, Ismail's success offers a replicable model for climate resilience in horticulture.

Climate-Smart Agriculture through Sunflower Cultivation in SALINE-PRONE COASTAL BANGLADESH

Sunflower Cultivation Restores Saline Lands



In the face of intensifying climate change and rising sea levels, vast stretches of Bangladesh's coastal zone have become uncultivable due to increasing soil salinity. Popular crops like rice and pulses fail to survive in such conditions, forcing thousands of hectares of farmland to lie fallow during the dry season. However, an innovative shift to climate-smart agriculture is transforming this landscape — led by the resilient sunflower.

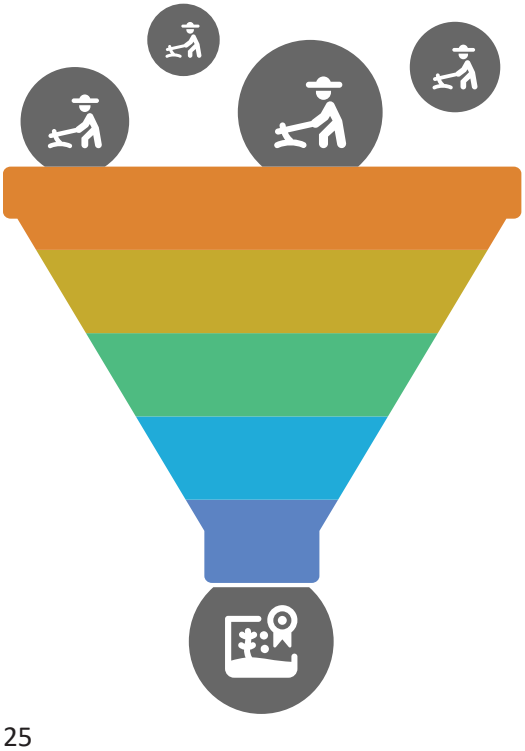
With support from Palli Progati Samity (PPS), under the Rural Microenterprise Transformation Project funded by IFAD, DANIDA, and PKSF, over 300 farmers in Patuakhali are cultivating sunflowers on 48 acres of saline land. This initiative, begun after cyclone-induced salinity disasters like Sidr and Aila, provides farmers with seeds, training, fertilizers, and financial support. The sunflower, which thrives in saline soil and produces 40–45% healthy edible oil, has become a game-changer.

Farmer Mizanur Rahman, who once left his land barren during the dry season, earned BDT 100,000 ($820) by cultivating sunflowers on one acre. Encouraged, he expanded to three acres in 2024–25, alongside 60 neighboring farmers who collectively cultivated 30 acres.

Sunflower cultivation is restoring income opportunities and hope to communities long devastated by climate impacts. The initiative is not only reviving fallow lands but also contributing to national edible oil production — a critical goal, as Bangladesh currently meets only 10% of its demand locally. Government estimates suggest that expanding sunflower farming on unused saline land could help meet 26% of national cooking oil needs.

This model showcases how climate-smart agriculture, backed by community-driven partnerships, can ensure food security, restore livelihoods, and build resilience in the face of climate change.

From Struggle to Sustainability: Jakir's Journey into CLIMATE-SMART FARMING



Jakir's Farming Transformation

Joining Farmers' Group
Jakir joins the Hatgobindo Safe Vegetable Farmers' Group

Learning CSA Techniques
Jakir learns and implements Climate Smart Agriculture practices

Implementing New Methods
Jakir applies CSA techniques on his farm

Increased Productivity
Jakir's farm becomes more productive

Higher Income
Jakir earns more from selling safe vegetables

Jakir Darani, a 38-year-old farmer from Hatgobindo village in Faridpur Sadar Upazila, spent years struggling to make ends meet through traditional farming. Despite his dedication, excessive use of chemical fertilizers and pesticides left his soil degraded, yields low, and income insufficient to support his five-member family.

“I was worried. My land was losing fertility, costs were high, and people were getting sick from unsafe food. I wanted change, but I didn’t know how,” Jakir recalls.

That change came in 2022, when Jakir joined the Hatgobindo Safe Vegetable Farmers’ Group under the Resilient Microenterprise Development (RMTP) project—supported by IFAD, PKSF, and DANIDA, with Society Development Committee (SDC) acting as the local implementing partner of PKSF.

Through training on Climate Smart Agriculture (CSA), Jakir learned to replace harmful practices with sustainable ones—using pheromone traps, yellow sticky cards, probiotics, organic fertilizers, mixed cropping, and mulching paper. “These methods have changed everything,” he says.

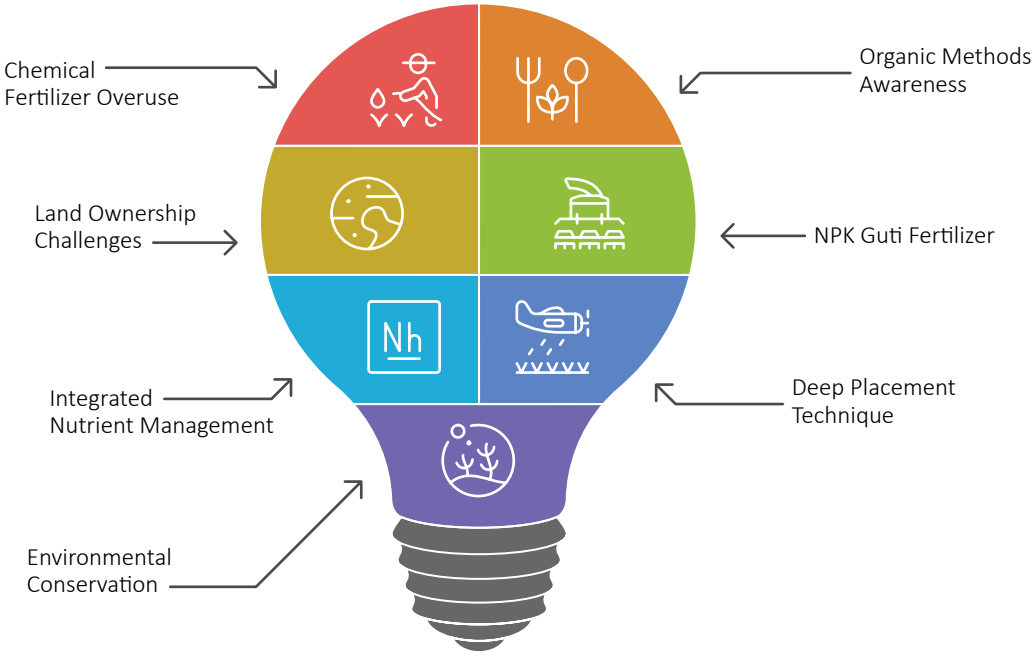
Today, Jakir cultivates 130 decimals of land, growing cucumber, bitter gourd, and ridge gourd—harvesting up to 400 kg per decimal. His costs have dropped, productivity has increased, and the environment around his farm is visibly healthier.

“People didn’t believe in safe vegetables at first,” Jakir says. “But now, they know. My vegetables sell faster and fetch higher prices.” This summer alone, he earned BDT 2,60,000.

Jakir’s transformation from a struggling farmer to a local pioneer in safe vegetable farming shows the impact of climate-smart agriculture. “I’m proud to be known as a safe vegetable farmer,” he smiles.

Unwavering Contribution to Maintaining ENVIRONMENTAL BALANCE

Sustainable Farming in Bangladesh



In Bangladesh, the overuse of chemical fertilizers has led to declining soil fertility and environmental concerns. Farmers often rely on these fertilizers to increase yields, especially for high-yielding varieties. However, this practice gradually depletes the soil and demands higher quantities of fertilizer over time. The lack of awareness about organic methods and challenges like fragmented land ownership further push farmers toward chemical dependence.

Arul Haque, a proactive entrepreneur from Bathangachi village in Maheshpur Upazila of Jhenaidah district, noticed that most farmers nearby used excessive chemical fertilizers through traditional broadcasting methods. This not only harmed the soil but also caused water pollution by contaminating groundwater with nitrates and chemicals. Concerned, Arul searched for a sustainable solution.

Through the RMTP project support by PFSF, IFAD, and DANIDA, partner organization Shishu Niloy Foundation supported Arul with a grant to purchase a machine that produces NPK guti (briquetted) fertilizer by compressing Urea, Phosphorus, and Potassium. This slow-release fertilizer is applied deep into the soil near plant roots using applicators. Farmers quickly saw its benefits—higher yields, reduced fertilizer use, and lower production costs.

NPK guti fertilizer enhances crop productivity due to its balanced nutrient composition and efficient delivery. Its deep placement minimizes nutrient loss, increases uptake, and improves soil health. The briquettes are especially effective in lighter soils, where traditional methods often fail.

Arul also promoted integrated nutrient management, deep placement, and organic matter use to further enhance efficiency and reduce environmental harm. His efforts have inspired local farmers to adopt sustainable practices, demonstrating that agricultural productivity and environmental conservation can go hand in hand.

Salma's Journey of INNOVATION AND SUSTAINABILITY

Salma Apa's Farming Achievements

In a small rural corner of Bangladesh, Salma Apa stands as a symbol of dedication, innovation, and resilience. A working housewife and a devoted mother of four—including two young children—she seamlessly balances family responsibilities while managing a large-scale fruit farming enterprise.

Despite her husband being abroad as a wage earner, Salma confidently runs 24 bighas of land—8 bighas each for papaya, banana (intercropped with pineapple), and dragon fruit cultivation. From planting to harvesting and marketing, she handles everything single-handedly.

Salma is also deeply committed to environmentally friendly farming. Understanding the need for sustainable practices, she invested Tk. 2.5 lakh to install a solar-powered irrigation pump. With support from the RMTP project, she added a sprinkler irrigation system to the southern part of her dragon fruit garden. These technologies have significantly improved efficiency—reducing labor from 6–8 workers a month to just 1, and water use from 40 lakh liters to 10 lakh liters monthly. Her electric bills have dropped from Tk. 4,000–5,000 per month to zero. Moreover, her income from dragon fruit sales has jumped from Tk. 7–8 lakh to Tk. 10–11 lakh per season.

Resourceful in every way, she uses pineapple and banana leaves for mulching, reducing weeding needs, and prepares organic fertilizer using cow dung. Now, she's preparing to install an IoT device—aided by RMTP—to monitor and optimize water and fertilizer use.

Salma Apa is not just a farmer; she’s a forward-thinking leader whose actions promote environmental balance and modern, sustainable agriculture. Her journey is inspiring many others to follow her path.

A Farmer's Journey Towards Climate Resilience: FROM SINGLE CROP TO SMART FARMING

Ismail's Journey to Sustainable Farming

Single Crop Farming
Ismail initially relies on a single crop, pointed gourd, with limited income

Joining Initiative
Ismail joins the "Ecology-Friendly Safe Vegetable Production and Marketing" initiative

Learning CSA Techniques
Ismail learns climate-smart agriculture techniques like mixed cropping and organic fertilizer use

Implementing Multi-Cropping
Ismail transforms his land into a vibrant, multi-crop farm

Increased Income
Ismail's income significantly increases due to his sustainable farming practices

Inspiring Others
Ismail's success inspires neighboring farmers to seek similar training

Md. Ismail Hossain, a smallholder farmer from Ghagurdoar village in Shibganj, Bogura, once relied solely on a single crop—pointed gourd (potol)—grown on his modest 24 decimals of land. With an annual income of around 65,000 BDT, his family's needs were barely met, and his land remained underutilized most of the year.

In 2024, Ismail joined the "Ecology-Friendly Safe Vegetable Production and Marketing" initiative under the RMTP of PKSF, implemented by TMSS. Through project-led training, he learned climate-smart agriculture (CSA) techniques like mixed cropping, eco-friendly pest control, organic fertilizer use, and efficient land and water practices.

Empowered with new knowledge, Ismail transformed his approach. He now practices multi-cropping, cultivating potol and ginger as main crops, intercropped with papaya, chili, turmeric, and kolmi greens. His once mono-cropped land is now a vibrant, productive patch of sustainability.

"My field is no longer just land—it's a source of hope," says Ismail. "I'm earning more, using fewer chemicals, and protecting nature for my children."

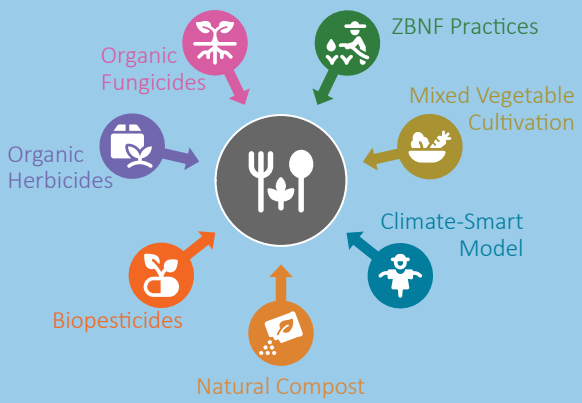
This shift boosted his expected seasonal income to over 110,000 BDT. Soil fertility improved, input costs dropped, and market demand grew due to his chemical-free produce.

"The CSA training changed everything," he adds. "Now I know how to grow smart, not just more."

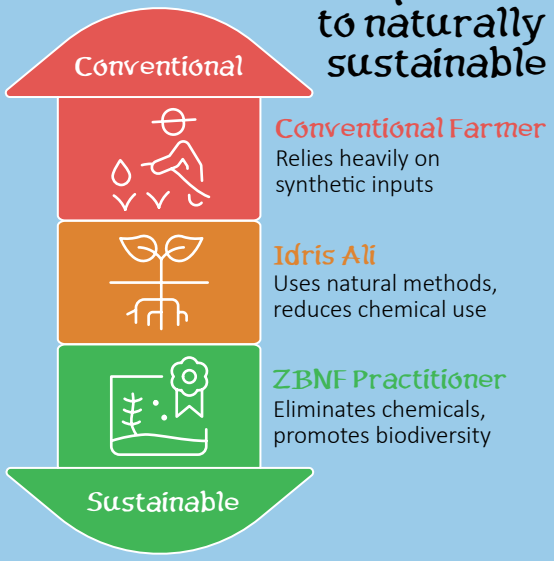
Ismail's success has sparked interest among neighboring farmers, many of whom are now seeking similar training. His story is a testament to how smallholders, with proper support, can build climate resilience and secure better futures—for themselves and the planet.

From Chemicals to Climate-Smart Cultivation: IDRIS ALI'S ECO-FARMING JOURNEY

Factors Contributing to Sustainable Farming Success



Farming practices range from chemical-dependent to naturally sustainable



In Bishnupur village of Chuadanga's Damurhuda Upazila, Mohammad Idris Ali is quietly leading a farming revolution. Once a conventional farmer dependent on chemical inputs, he is now a proud practitioner of Zero Budget Natural Farming (ZBNF) and mixed vegetable cultivation—thanks to the support and training provided by WAVE Foundation under the PKSF, IFAD and DANIDA-financed Agroecology Project.

Facing crop failures due to erratic rainfall and rising costs of synthetic fertilizers, Idris shifted to a climate-smart model. He now cultivates ridge gourd, red amaranth, cucumber, Malabar spinach, bitter gourd, and yard long beans on 60% of his land through an integrated, multi-layered system. This not only diversifies income but also strengthens soil health and pest resistance naturally.

"I used to spend so much on chemicals, yet the soil was dying. Now, with natural compost and biopesticides, my farm is alive again," says Idris with pride.

Using fermented plant extracts, organic composts, and probiotic bio-fertilizers, he manages pests and nourishes crops—without harming biodiversity. Organic herbicides and fungicides keep weeds and diseases at bay, while the farm thrives year-round with minimal input costs.

His produce, sold as "100% safe vegetables" in Chuadanga town, fetches premium prices and inspires other farmers to go green. The environmental benefits are equally impactful—clean water, restored soil biodiversity, and reduced greenhouse emissions.

"This model is not just good for the earth, it's good for our future," he adds.

Idris's success showcases how agroecology and ZBNF can empower farmers, safeguard the environment, and build resilient rural livelihoods. His story is a living testament to the power of sustainable farming in the face of climate change.

Moringa-Banana -Coffee Agroforestry Brings CLIMATE-SMART CHANGE TO SITAKUNDA

Agroforestry Model Benefits in Sitakunda

1 Enhanced Soil Fertility
Improved soil fertility supports long-term environmental health

2 Increased Coffee Yield
Higher coffee yield boosts income while enhancing environmental sustainability

3 Initial Coffee Struggle
Initial challenges highlight the need for protective measures

4 Extra Income from Moringa and Banana
Additional income diversifies revenue streams despite environmental limitations

In the drought-prone hills of Eyakub Nagar village in Sitakunda, Chattogram, farming was once limited to a single monsoon season due to severe water scarcity. Most of the year, the land lay barren, and local families struggled to make ends meet through seasonal fruit farming.

But in 2022, a transformative initiative under the YPSA-RMTP (HVC&F) project brought together local gardeners to create an innovative agroforestry model. They introduced intercropped coffee cultivation alongside shade-giving Moringa and Banana trees — a climate-smart solution to the region's harsh conditions.

Initially, coffee struggled under the extreme heat. In response, the farmers agreed to plant Moringa and Banana as protective shade crops. This approach not only shielded coffee plants but also brought multiple benefits. "Now, our coffee yield is higher, and we also earn extra income from Moringa and Banana," said Mr. Rahim, a farmer who reported a net profit of BDT 32,500 from his integrated farm this season.

Both Moringa and Banana thrive with minimal water and enhance soil fertility by increasing organic matter. Their fast growth and high carbon absorption make them effective tools in fighting climate change. Moreover, their low pest incidence allows coffee to be grown without chemicals, reducing environmental harm.

"This mixed model is now a proven success in Sitakunda. Farmers are earning more and protecting their land at the same time," said a YPSA field officer. The model is gaining popularity rapidly, and local nurseries now stock high-demand coffee saplings.

By blending tradition with innovation, this climate-smart agroforestry system offers a resilient and sustainable path forward — one that's reshaping the future of farming in Sitakunda.