SUSTAINABLE DEVELOPMENT

Sub Project Title : “Eco friendly Mango Production and Trade for Sustainable Development of the Enterprises”

Sustainable Enterprise Project (SEP)

THE WORLD BANK
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PKSF

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Acronyms:

BARI : Bangladesh Agriculture Research Institute
BDT : Bangladesh Taka
BSTI : Bangladesh Standard & Testing Institute
ECR : The Environment Conservation Rules
EMPS : Equipment Monitoring and Performance Station
EV : Export Volume
GAP : Good Agriculture Practice
GDP : Gross Domestic Product
GGAP : Global Good Agriculture Practice
GHP : Good Handling Practices
GMP : Good Manufacturing Practices
ISBN : The International Standard Book Number
ME : Micro-entrepreneurs
MSME : Micro, Small and Medium Enterprises
NRGA : Non-Revenue Generating Activities
PIP : Program Implementation Plan
PKSF : Palli Karma-Sahayak Foundation
PO : Partner Organization
SC : Sanitary Certificate
SEP : Sustainable Enterprise Project
SRDI : Soil Resource Development Institution
UP : Union Parishad
WB : World Bank

Introduction

Enhancing environmental sustainability and climate resilience are becoming increasingly important for sustaining Bangladesh's economic progress. Embarking on a greener growth pathway would provide major benefits for Bangladesh in terms of increased productivity and innovation, access to new markets, generation of public revenue and reduction of vulnerability to shocks. In this context, PKSF is now implementing a Government approved project named 'Sustainable Enterprise Project(SEP)' funded by World Bank. The project Development objective of SEP is set as to increase the adoption of environmentally sustainable practices by targeted micro enterprises. Micro enterprises are a vital component within the economic system of Bangladesh. 56% of our employment generates from this sector. Recognizing the potentiality of this sector, PKSF is implementing several programs and project through 178 Partner Organizations(PO) at the grassroots level. At the same time, improving environmental sustainability and climate resilience are also important in maintaining Bangladesh's economic progress. According to a study conducted by The World Bank, by 2050. 5.3 million Bangladeshis will be affected by the consequences of climate change. The World Bank estimated that outdoor and indoor air pollution and workplace environment risks are responsible for productivity loss for about 1.6 and 0.5 percent, respectively, of gross domestic product(GDP).

Due to this short of forecasting PKSF has been implementing the multidimensional project with different partners focusing on integrated approach targeting the environmental improvement. This booklet has been made by getting the field level practical data through implementing the series of intervention at the project ground. The aim of this booklet is that the reader will be able to know how to attain the sustainable development at the MSMEs level in a greater extent. In addition, it will also be supportive for creating the awareness among the all-mango value chain actors so that they could adopt the Good Agriculture Practices (GAP) during the field level implementation with trustworthy. This booklet will be open for all and any one could utilize these resources for upgrading their professionalism unless prohibited.

Background of Sustainable Enterprise Project (SEP)

Environmental sustainability and climate resilience are significantly important for sustaining Bangladesh's economic progress. Bangladesh ranked 173 out of 180 countries on Yale's 2016 Environmental Performance Index. Globally, Bangladesh ranks among the countries with the economy most at risk due to the impacts of climate change. The rapid growth of manufacturing, dominated by micro, small and medium enterprises (MSMEs), has led to a massive increase in natural resource use and degradation and to growing air, soil and water pollution. Reducing negative environmental externalities has been identified as a priority area for Bangladesh to continue progress toward reducing poverty and inequality. Embarking on a greener growth pathway would provide major benefits for Bangladesh in terms of increased productivity and innovation, access to new markets, generation of public revenue, and reduction of vulnerability to shocks.

The Sustainable Enterprise Project (SEP) was conceived under the context of ensuring environmental stability and economic growth. Environmental sustainability and climate resilience are imperative for sustainable economic progress. The project is financed jointly by PKSF and The World Bank for the microenterprise sector to improve its environmental sustainability.

The project consists of three components: (a) enhancing services and enabling systems, (b) strengthening access to finance for commercially viable environment-friendly and resilient microenterprises, and (c) project management, knowledge management, and monitoring and evaluation. The project prioritizes (i) a selected number of polluting microenterprise business clusters, that can reduce emission and increase resource efficiency and (ii) the expansion of innovative economic activities that contribute to environmentally friendly clean and green business and climate resilience.

The project has been working relentlessly to increase the adoption of environmentally sustainable practices by targeted microenterprises since its inception in 2018. The project activities have been designed to encourage environmentally sustainable production and address environmental and climate challenges in the microenterprise sector of Bangladesh. Sixty-four sub-projects under 30 sub-sectors have been selected under this project. The sub-projects are being implemented by 47 Partner Organizations of PKSF targeting 40,000 microenterprises of Agribusiness and Manufacturing sectors.

Under this project, the microenterprises with the potential to scale up their activities, will be under the umbrella to maximize finance and technical services for environmentally sustainable development in Bangladesh. The project activity also focuses on the occupational health and safety of the workforces with environmental wellbeing, environment certification, product certification, and capacity development for both the PO and ME level.

To achieve sustainable and resilient enterprises with optimum environmental and business opportunities, both non-revenue and revenue-generating common services at the cluster level have been introduced under the project. In addition, PKSF continues to disburse microenterprise loan through its Agrosor program to strengthen the financial access of the microenterprises.

Overview of Sub-Project

Mango is the most popular among the fruits produced in this country. Various local and high- yielding varieties of mangoes are produced in almost all parts of the country. Earlier mango cultivation was limited to a few districts like Rajshahi, Chapainawabganj, Dinajpur, Natore, Naogaon, Pabna, Meherpur, and Satkhira. Naogaon, another district of the Barendra region, is rapidly progressing falling behind Chapainawabganj, the capital of mangoes, in mango production. The major reason for these circumstances is that the High Barind Region has turned into a drought-prone area due to the effect of climate change impact since the last two decades, and major areas of Naogaon are lying under the High and medium Barind regions. Bangladesh Agriculture Research Institute (BARI) recommended that mango is drought tolerant, has low water requirement, and high profitable fruits crops suitable for the Barind region to expand its cultivation. So, in the last few years, commercial mango gardening has expanded in this area with early, medium, and late varieties. As a result, the majority of the total mango production of the country is now coming from Naogaon. According to the information of the Department of Agricultural Extension, the total mango production across the country was 23 lakhs 72 thousand tons in the fiscal year 2018-19. Out of this, three lakhs 33 thousand 486 tons come from Naogaon. Among the 10 Upazilas of Nagaon district, Sapahar and Niamatpur Upazilas are considered highly potential mango production centers along with Porsha and other Upazilas.

Mango production is not at the same rate at every year. If taken care of the garden good yield could be possible every year. Right now the mango gardeners are unscrupulously using imbalanced

chemical fertilizer, pesticides as well as hormone for maximizing the total yield. Many times illegal drugs and chemicals are being used in mango whose residues remain within mango and people are consuming it. Different types of ripening agent are severely used by the seller which are enormously detrimental for the human body.

Without testing the soil people are disproportionately using the chemical fertilizer which are killing the microorganism resulting the degradation of the soil ecosystem. Microorganisms assist fertilizer like urea, potash, phosphate another element for easily uptaken by the plant. Due to decreasing the beneficial microorganism the soil is losing its fertility day by day resulting the poor soil health and deteriorating the tree lifetime causing less yield which is also a great concern for the crop production.

Mango production in Naogaon district is increasing but the orchard owners are not aware about the use of modern technology, improved packaging, proper storage, processing etc. Due to lack of knowledge on post harvest techniques, marketing at the premium market as well as export market, processing of mango - a big amount of mangoes is getting damaged causing natural disasters and improper plucking. On the other hand, people are not producing mango based product like pickle, mango bar, jam, Jelly. Few number of people are doing but not hygienic resulting poor sale.

In order to solve all these problems and to produce healthy soil , healthy mangoes, by establishing new marketing channel to maintain the safe and friendly environment around the mango garden as well as the home of farmers, expanding the uses of organic fertilizers and organic pesticides, making vermi/trico compost, using modern technology, using proper pest management, strengthening the mango frames capacity through certification in branding and ensuring access to premium market, Ghashful is implementing the sub-project “Eco-Friendly Mango Production and Trade for Sustainable Development of the Enterprises”

Project Type

- Type of Business: Agribusiness.
- Name of the Sector: Horticulture
- Name of the Sub Sector: Mango (Fruits)
- Environmental Classification: Orange- A (Based on ECR Rules, 7(2), Bangladesh)

Salient Features of the Sub-project:

Sub-Project title: Eco-friendly Mango Production and trade for Sustainable Development of the Enterprises (EMPS)-2018- 10-Ghashful-22O-85

Goal and specific objective of the sub-project:

The goal of the project is `sustainable safe Mango production and marketing to ensure environmental sustainability with good practice to reduce health and environment risk.’ And the objectives are:

a) Safe mango production followed by Good Agricultural Practices (GAP).
b) Diversification of Mango products from green mango.
c) Economic development with competitive prices and linkage with the premium market.
d) Micro entrepreneur’s skill development by providing different training.

Project Period

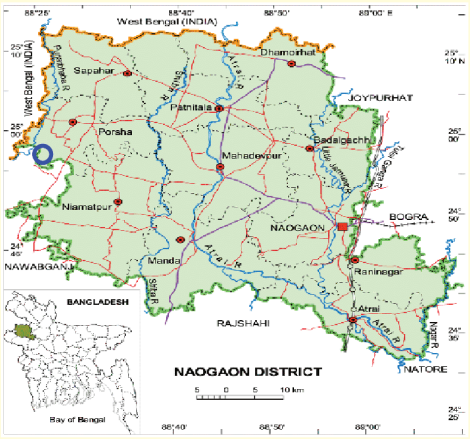
According to the agreement, the project period is three years and three months, which started on 27th October 2020 and completed at the date of January 2024 with nine months' extension approved by PKSF.

Project area

The sub-project has been implemented in Sapahar, Niamotpur and Patnitala Upazila of Naogaon district and has covered seventeen unions under the three Upazilas.

Target Clients of the sub- project

A total of 800 entrepreneurs have been selected through the survey during the project period in the working area from the targeted branches focused on who are involved with commercial mango production and gardening; and willing to adopt Good Agriculture Practices (GAP) and borrow loans or invest in making the enterprises environmentally sound and produce safe mango-to promote or join with mango premium market.



Donor Organization

The sub project is financed by Sustainable Enterprise Project (SEP) of Palli- Karma-Sahayak Foundation (PKSF) and World Bank.

Journey of Project Implementation:

Staff Deployment:

In accordance with the approved project work plan Ghashful has been recruited and deployed the qualified project staff at the ground level timely and those are very capable and performing their assign obligation in a very professional way comparetd to the others.

Office setup:

There are two offices one is Project office and another one is branch office have been established accordingly. Necessary furniture's, office equipment's also have been installed and delivered to the employees respecting the needs in order to attain the project output very rapidly.

Introductory engagement meeting among the Project Stakeholders:

At the inception stage according to the annual workplan, series of individuals and group meeting has been conducted on both of the project site (Sapahar, Niamotpur and Patnitala) among the project stakeholders for example government counterpart, mango orchard owner, input supplier, depot owner, whole seller other service provider, research station etc along with the Ghashful micro finance team.

Project launch workshops have been carried out on both of the project sites in present of Upzila Nirbahi Offieer, Upazila Chairman as well as another VIP guest. A project introductory meeting also has been carried out at the District commissioner meeting room at Naogaon District respectively. Project booklet, Baseline survey, Baseline video documentary and Endline evaluation, endline video documentary also have been conducted in accordance with the project terms of references on time. In order to information dissemination World Environment Day and Victory Day also have been celebrated by the project in presence of targeted value chain actors.

Focused on project targeted beneficiaries total 800 in numbers, project team worked hard owing to attain the planned target. Below are the prescribe project activities as per component proliferated respecting the approved project proposal by turns.

Project has been separated in different component and sub component in order to make sure the implementation process easier to gain the project estimated goals and objectives orderly basis. The major purpose of the project component is to enhance positive environmental impact, climate resilience, production efficiency, PO capacity development, ME capacity development and value chain development through the sub-project.

Component-01 Enhancing Services and Enabling Systems

The following activities have been designed and implemented under the sub-components/major activities of component – 01; such as:

Sub Component: 1.1: Support for enabling systems:

1.1.1: Non-Revenue Generating Physical Activities,
1.1.2: Initiatives to Increase Eco Labeling and Access to Premium Markets,
1.1.3: Capacity Building of the POs),

Sub Component 1.2: Capacity development of MEs,

Sub Component 1.3: Investment in Common Revenue Generating Services.

Sub Component: 1.1: Support for enabling systems:

1.1.1: Non-Revenue Generating Physical Activities:

Under this head, the following activities have been carried out to improve environmental health through introducing climate-resilient technologies in mango production, processing, and dissemination to extend uses by the Mango entrepreneurs inside the project ground through the demonstration effect.

Table 1: List of Non-Revenue Generating Common Service

Sl/No.	Description (Services)	Nr of Unit Established	No of Beneficiaries
01	Toilet in Market Place	3	150-200 users/Day
02	Demonstration Plot (Ecological Farming, Fruits Bagging, Organic Fertilizer Production Center, Organic Bio-pesticides Center etc.)	60	60
03	Garbage House/Garbage Carrier	4	Directly 800, Indirectly 3,56,000 people
04	Website Development	1	20 Micro entrepreneurs using website for expanding their business

1.1.1.i Demonstration Plot:

(Climate resilient technologies and best practices dissemination through the Demonstration Effect)

The major purposes of these demonstrations are to reduce unjustified pesticide and chemical fertilizer uses and improve the orchard microenvironment, safe and high-quality mango production, and enhance soil productivity. All the demonstrations have been conducted with the natural farming theme and special project care and support have been provided to the respective farmer.

The technologies were demonstrated in two ways the first slot was demonstrated before the flowering period to the harvest period, and the second slot was after the harvest period for a completely successful demonstration. During the reporting period, 60 demonstration plots(mango orchard) have been established in Sapahar, Niamotpur and Patnitala Upazilas under Naogaon District, and each of the plot sizes is two bighas or 66 decimals. The following types of climate- resilient technologies were demonstrated includes:

I. Mango bagging, sex pheromone traps, and yellow or blue traps to reduce insect and disease infestation
II. Organic manures like Vermi compost, Trico compost, bone meal and lime very effective for increasing the soil fertility, structure, texture, decline the water leaching, reactivate the microbial activity, and increase soil moisture preservation capacity,
III. Tipping and Punning of unexpected branches of the trees and other intercultural practices like drainage system improvement,

The effect of the demonstration is presented below-

1.1.1. Fruits Bagging and Pheromone Traps Methods

Just before the fruits maturing stage fruit fly infestation highly occurs in a mango orchard and this is the great concern for the mango producers. That causes low production and decreased mango quality alongwith yield. And according to farmers' opinions, 25-30 % of yield losses occur only for fruit fly infestation. Farmers usually use insecticides frequently to prevent their attacks. It has been observed that only to prevent fruit fly attack seven to nine-time, a mix of pesticides is used in a month but difficult to control it. The sub-project supplied on an averages 3000 mango bags and 50 pheromone traps for each demonstration with training. An observation illustrated that 100% bagged mango became safe from fruit fly attack and 500–600 fruit flies became trapped by one pheromone trap weighing approximately 2-3 grams a season (observation). The farmer opined that such a way produced mango bears export quality color, prolonged maturity period,

Fig: Demonstration mango bagging methods

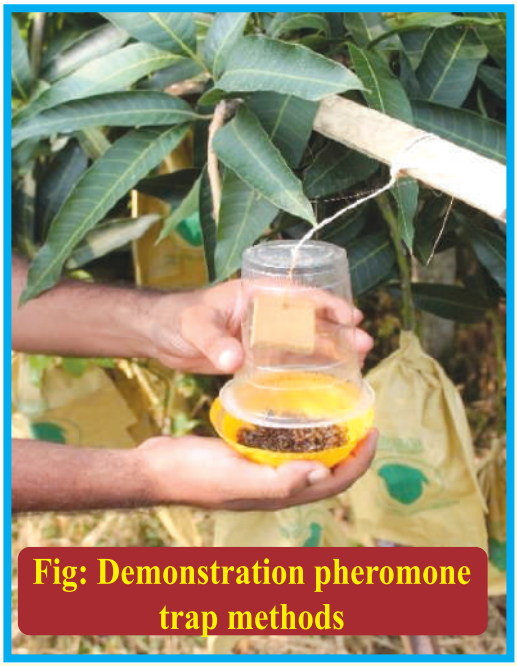


Fig: Demonstration pheromone trap methods

prevents fungal infestation after harvest and transport, and shelflife also increased.

According to the local input supplier information mango bag usee by the mango farmers gradually is increasing in the project area due to demonstration as well as collective motivational work by the project personnel, resource farmers and trained input sellers. Followed by the success of the technologies, neighbor farmers motivated and adapted the technologies. And the increasing trends of fruit bag and pheromone traps usee from 2020-2023 are shown below (Charts 1 & 3).

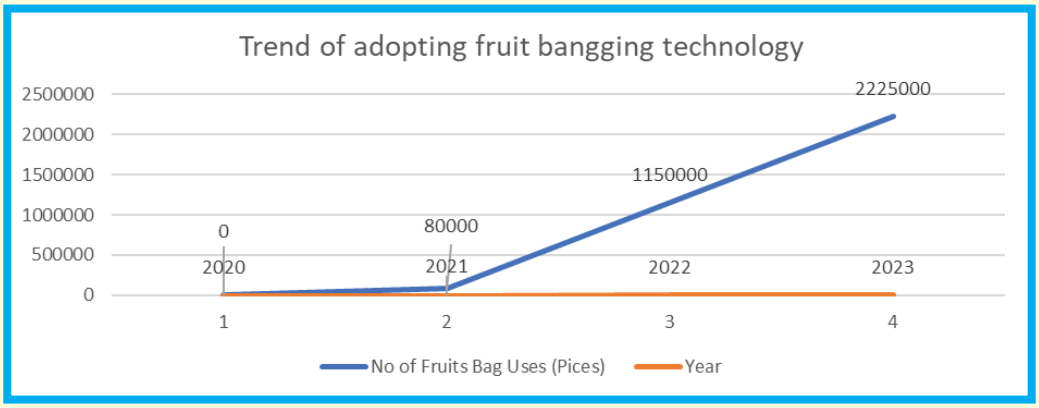


Chart 1: Representing the trends of adopting fruits bag technology among mango grower

Table 2: Chemical Reduction performance between inside and outside demonstration plots using fruits bagging technology.

Sl/No	Year (only bagging period)	No of ME	Amount of chemical pesticide application outside the demonstration plots without using fruit bags (liter)	Amount of chemical pesticide application inside the demonstration plots using fruit bags (liter)	Amount of Chemical Pesticide reduced (Liter)
01	2020	0	10	10	0
02	2021	20	15	0	15
03	2022	40	29	0	29
04	2023	60	43	0	43

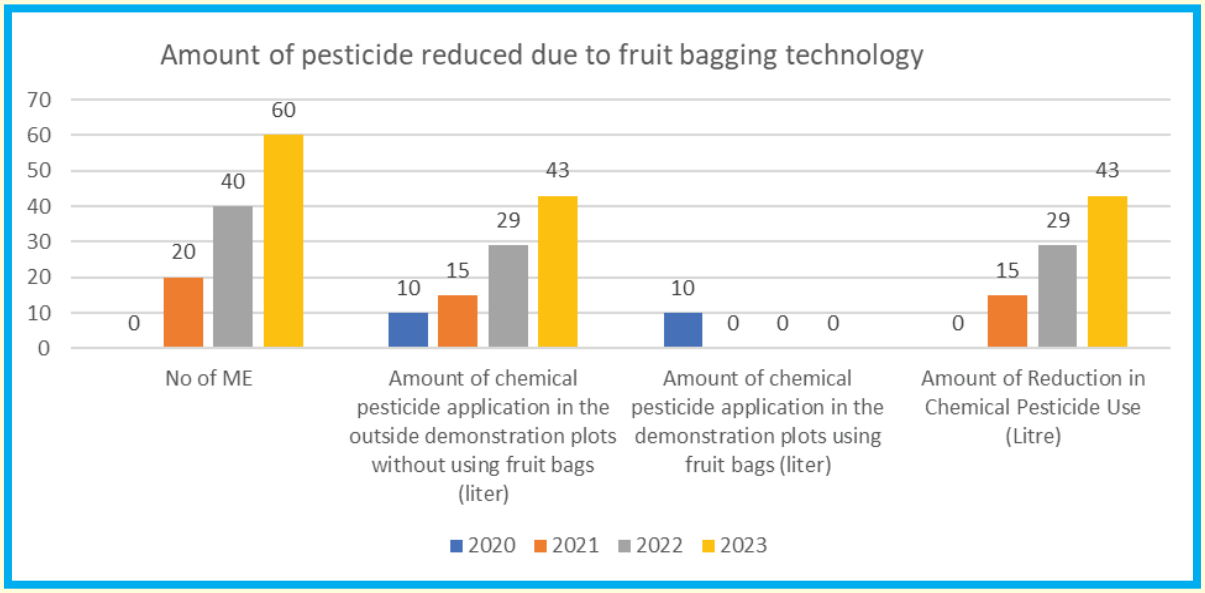


Chart 2: Chemical Reduction performance between inside and outside demonstration plots using fruits bagging technology.

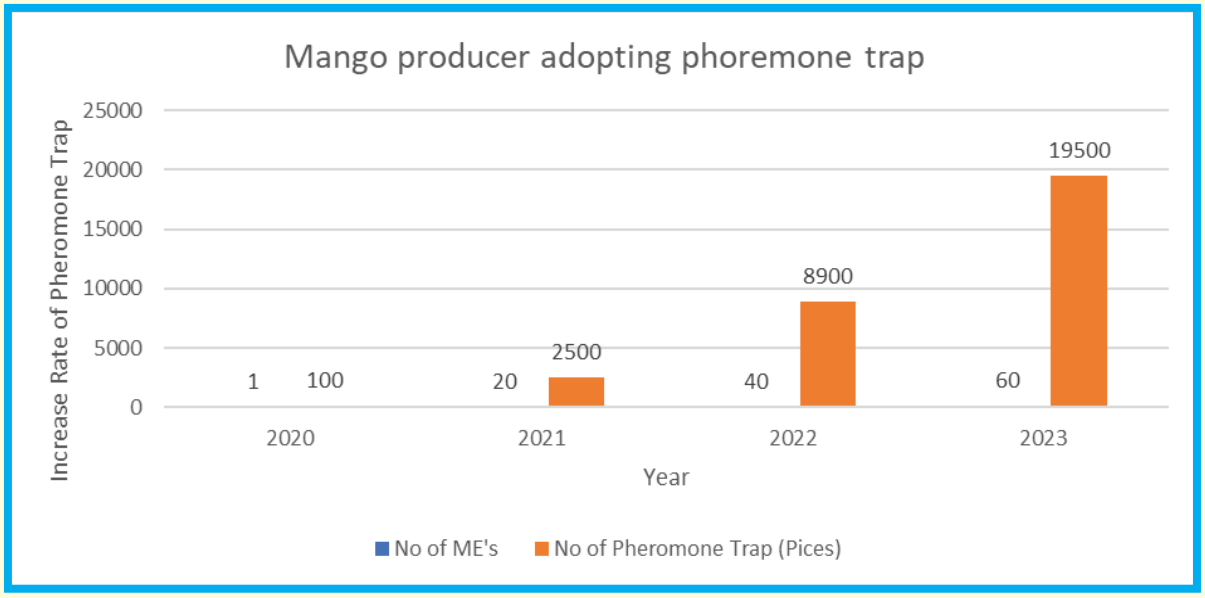


Chart 3: Depicting the trends of using pheromone traps among mango growers

Table 3: Chemical Reduction performance between inside and outside demonstration plots using pheromone trap technology.

Sl/No	Year (Only pheromone trap using Period-two months)	No of ME	Amount of chemical pesticide application outside the demonstration plots without using pheromone trap (liter)	Amount of chemical pesticide application inside the demonstration plots using pheromone trap (liter)	Amount of Chemical Pesticide reduced (Liter)
01	2020	0	10	10	0
02	2021	20	15	9	6
03	2022	40	29	15	14
04	2023	60	43	18	25

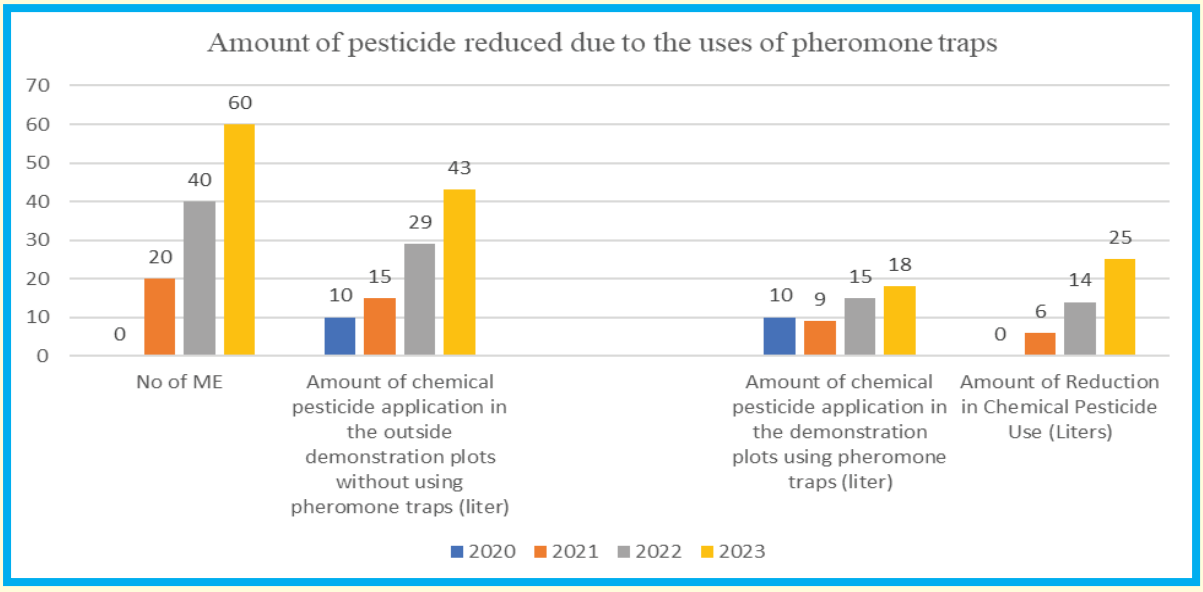


Chart 4: Chemical Reduction performance between inside and outside demonstration plots using pheromone trap technology.

Observation: The field-level study has been revealing that farmers' perception of embracing modern agriculture technology is changing significantly. In 2020, the number of mango grower using fruits bag and pheromone traps were nearly nonexisting. Only one demonstration plot farmer used the trap in a minimal quantity among 40 mango farmers. But this scenario shifted positively in 2022, where it presents that (charts 1 &3) from 40 respondents, all the farmers use fruit bags and pheromone traps in their orchards. Mango growers used around 1150000 pieces of fruit bag and 8900 pieces of pheromone traps in 2022, and in 2021 it was around 80000 pieces of fruit bag and 2500 pieces of pheromone traps. It was estimated from the field-level data that nearly 30,0000-35,0000 lakhs of fruit bags were sold in Niamotpur and Sapahar Upazilas during the last season (2022). But in 2023, 700,000–8000,000 pieces of fruits bags are sold in the project area.

As shown in the charts (2 and 4), using fruit bagging technology and pheromone traps at ground level has reduced the use of pesticides significantly. The tendency to use pesticides among traditional farmers is increasing day by day, but its use is decreasing in demo plots. From 2020 to 2023, the use of pesticides per bigha increased from 10 liters to 43 liters, but as a result of fruit bagging, its use has reduced to zero in 45–60 day periods. In addition, the number of pheromone traps is reduced to 25 liters, whereas the amount of pesticide used by typical farmers is 43 liters per bigha.

Result: Now a day, more farmers are likely to adopt these two eco-friendly methods because the result was impressive. Mango growers spray pesticides 25-30 times in their orchards per season. The cost of pesticides and labor is also increasing day by day. Considering the expense, they now realize the hazardous effect on human health. Mr. Sohel Rana, a micro-entrepreneur of Ghashful SEP, said, "After adopting fruits bagging technology, I have found that it protects mangoes from diseases and pests and boosts the production of export quality mangoes. According to the local input supplier, 'The demand for fruit bags and pheromone traps in mango farming has been increasing and becoming popular in the project area.

1.1.2. Yellow/Blue Traps methods

This is noted that each fruiting season farmers 25-30 times sprayed pesticides in a mango orchard, and 60-70% sprayed only for other insect and pest control(observation). That deteriorate health of the mango tree's tender leaves and twigs and suppressed the normal growth and development. To reduce insect infestation and growth acceleration the project also demonstrated Yellow/Blue Traps. The result of this method significantly demonstrated that it will play a vital role on reducing the insect infestation in near future.

Fig: Demonstration Yellow trap methods

Chart 5: Showing adaptation Yellow trap technology

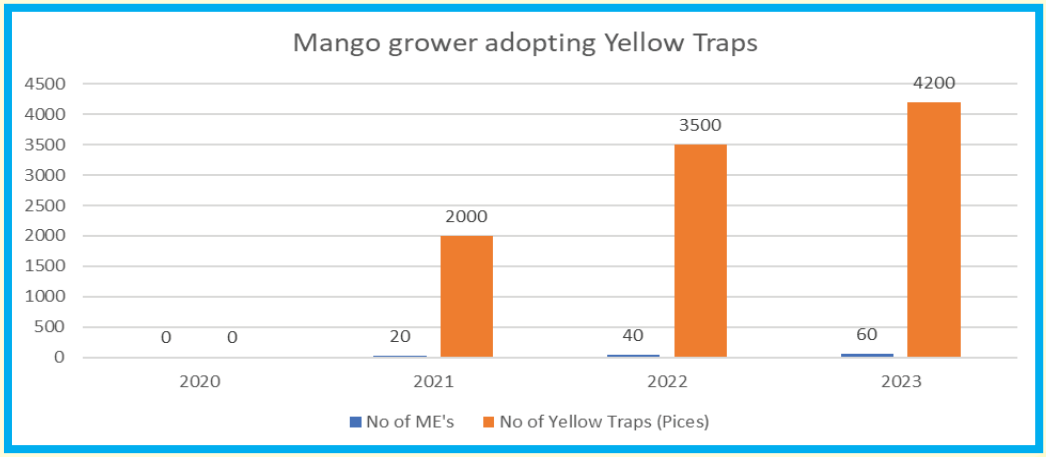


Table 4: Chemical Reduction performance between inside and outside demonstration plots using yellow trap technology.

Sl/No	Year (Only pheromone trap using Period-two months)	No of ME	Amount of chemical pesticide application outside the demonstration plots without using pheromone trap (liter)	Amount of chemical pesticide application inside the demonstration plots using pheromone trap (liter)	Amount of Chemical Pesticide reduced (Liter)
01	2020	0	10	10	0
02	2021	20	15	12	3
03	2022	40	29	19	10
04	2023	60	43	28	15

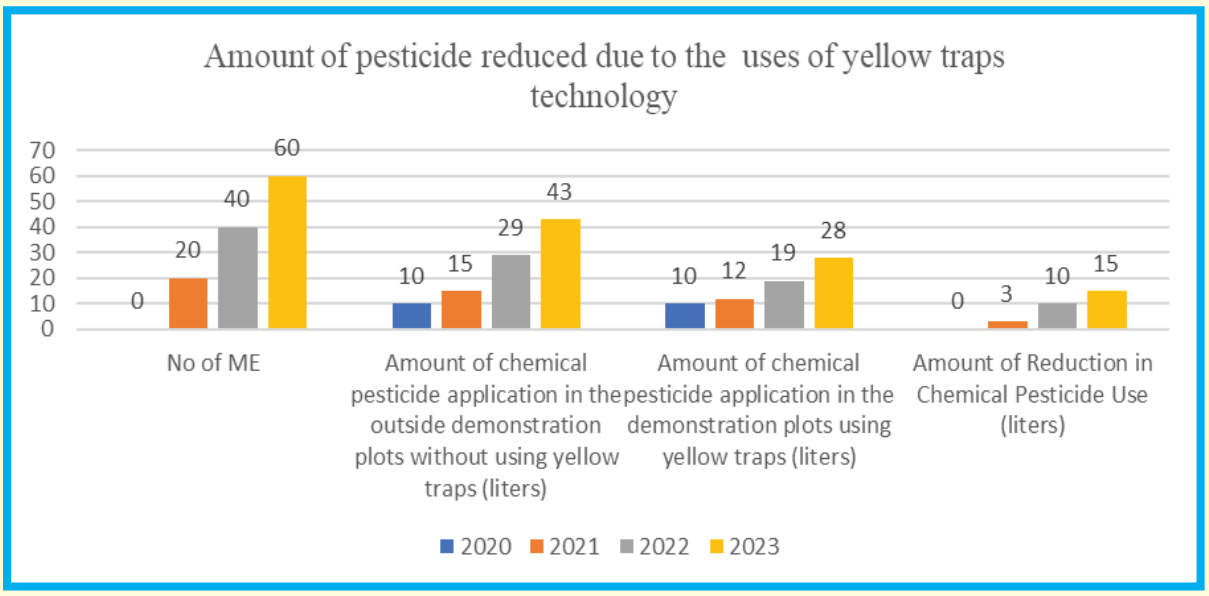


Chart 6: Chemical Reduction performance between inside and outside the demonstration plots using yellow trap technology.

Observation: A field study has been made with the 60 Demonstration Plot about their willingness to adopt the yellow trap in their mango orchards. Comprising the data, result shows that about 4200 pieces of yellow traps were used in mango orchards in 2023, and it was about zero in 2020, whereas in 2021, 2000 pieces of yellow traps were used (chart 5).

Result: In the 15-21 days' period of using these traps, it is estimated that about 100-120 fruit flies are found dead. Chart – 6 demonstrate that in 2020, where farmers were using 10 liters of pesticides per bigha in a 45–60-day period of time, in 2023, the amount came to about 43 liters. But from the data collected from the demonstration plot, it can be seen that only 28 liters of pesticides were used in that plot during that time.

Vermi compost and Trico compost methods

Fig: Organic fertilizer distribution to the lead ME

The Barind Tract is a distinct uplifted agro-ecological zone in Bangladesh, and water-use-efficiency is a crucial consideration for the region due to the limited soil water- holding capacity. Because, Barind soil poses less than 1.5 percent, and some soils contain even less than one percent organic matter, whereas good soil should have at least 2.5 percent organic matter. So soil management with liming and organic matter can be the best way of boosting water holding capacity as well as crop yield by 25 percent on an average in the high Barind area because most of its lands have turned acidic at present, hampering crop production badly (said Dr. Nurul Islam, Principal Scientific Officer of Soil Resource Development Institution (SRDI).

To overcome the situation, the sub-project has planned for the improvement of soil health by increased use of organic manure like vermi compost and Trico compost as a source of soil microorganisms, which are the primary agents that enhance the decomposition and release of minerals in the soil system, increase water holding capacity, reduce the negative effect of chemical fertilizer and pesticides and ultimately increase crop tolerant to disease, insect and also prevent soil erosion.

The SEP project provided on an averages 500 kg of Trico-compost for each demonstration plot. 1880kg of the bone meal was distributed among 60 demonstration plot owners along with the technology demonstration package.

Result: It has been observed that earthworm activity has increased, and plant growth has become vigorous in the demonstration plot. And the result took a positive turn among demonstration plot owners; instead of using chemical fertilizers now, they are prone to use organic fertilizers in their orchards.

Mango Picker

Mango post harvesting technique is one of the most essential operations which have been playing a vital role on profitable mango marketing. Mango picker is one of the imperative instruments required for the standard level of harvesting due to utilizing this, improve the quality of taste, preservation, reduce the storage level diseases and insect infestation, and improve the market price. In Bangladesh, mango harvest is mainly done by hand picking, or local mango picker named these (made of bamboo sticks and bags), which needs enormous labor, and causes of sufficient latex falls from the collected mangoes and wrap up the mangoes. Thus the way harvested fruits' color and preservation qualities deteriorated by about 20-25 %, and due to this situation, the price of mango dropped by 70 percent (according to farmers' opinion) because consumers prefer fresh mangoes free from the foreign materials.

The Ghashful SEP project has provided ten modern and mechanized mango harvesters /pickers to the lead entrepreneurs of the SEP project to solve the problem. A mango harvester is a modern technology that requires no hand involvement during harvesting. It is a secure technology that diminishes the mango fall and bruises, including protecting mangoes from spreading latex on the upper body.

Fig: Implementation of mango picker

Observation: Based on data collected from mango harvester users, farmers are satisfied with using mango pickers and said it is a safe technology that reduces mango fall by around 99 percent. This practice directly supported ten micro-entrepreneurs and encouraged other mango growers to utilize this technology in their orchards.

Result: By using these outstanding technologies, farmers can produce good quality mango, could get high prices, and even export good quality mangoes.

1.1.3. Cover/Inter Crops cultivation in mango orchards:

Farmers are naturally habituated regarding the herbicides used in their orchards at least four times every season, but cover crops disrupt the growth of weeds in the orchard and lower the use of herbicides in mango orchards by 50%. Root nodules (leguminous species) of cover crops absorb nitrogen directly from the air and supply it to the soil, thereby reducing soil nitrogen deficiency. It aids farmers to reduce the financial expenses and maintains soil structure by developing the soil eco-system on the other hand it creates a natural habitat for the beneficial microorganisms and prevents soil erosion.

Fig: Cultivating Maskalai in the mango orchards

Note: [Cover/Inter crops mean crops, especially leguminous plants that cultivate within the main crops. The cultivation of cover crops such as Mashkalai beans, soybeans, lentils, Mustards and alfalfa on the land increases crop production by increasing the nutrient content of the soil without harming the main crops. Cultivating these crops plays a significant role in improving the environment by reducing the chemical uses meanwhile, creates additional economic benefit for the farmers].

Result: Under the initiative of the Ghashful SEP project, the mango farmers of the project area have always been getting advices on cover crop cultivation. As a result, in the year of (2022), about 30% (estimated) of mango farmers in the Sapahar and Niamatpur areas have cultivated Maskalai in mango orchards as a cover crop was almost zero earlier in 2020 (Chart 7).

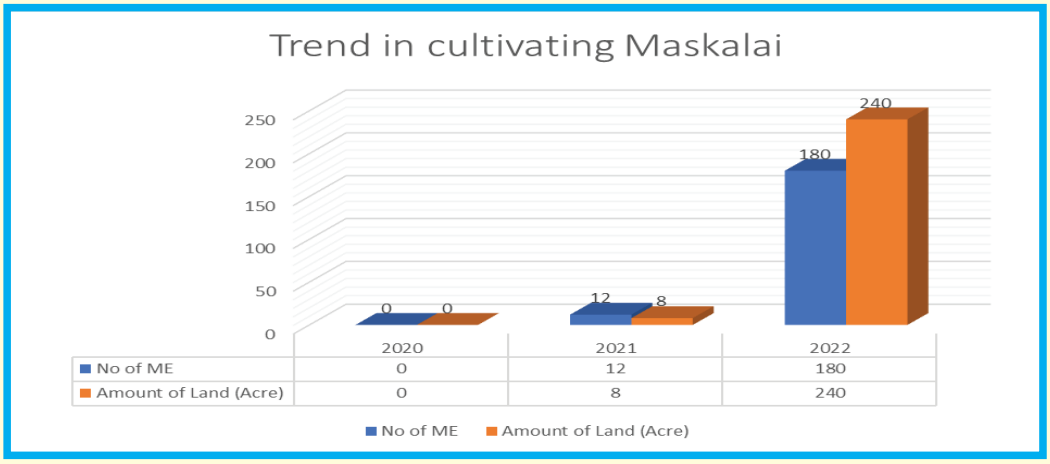


Chart 7: Trend of cultivating cover crops (Leguminous plant) in project area.

Table 5: Trend of herbicides reduction due to cover crop (Leguminous plant) cultivation.

Sl/No	Year (One season)	Amount of herbicide application outside demonstration plots without cultivating Mashkalai (liter)	Amount of herbicide application in the demonstration plots cultivating Mashkalai (liter)	Amount of herbicide reduced (Liters)
01	2020	0.5	0.5	0
02	2021	0.7	0	0.7
03	2022	0.7	0	0.7

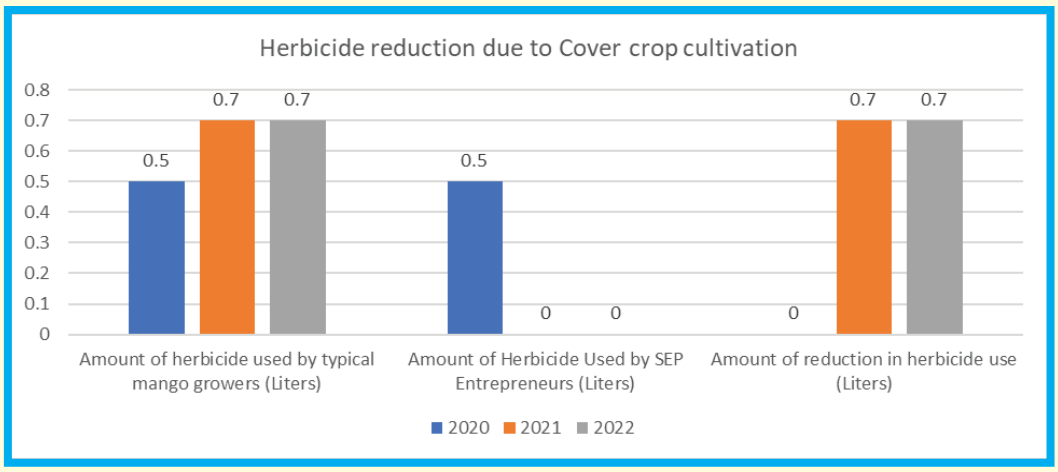


Chart 8: Trend of herbicides reduction due to cover crop (Leguminous plant) cultivation.

Observation: According to chart no 7, the study has found that after the intervention of the SEP project, mango farmers in those areas showed interest in producing cover crops along with principal crops. Ghashful SEP project has given out about 161kgs of Maskalai among the 20 mango farmers to create awareness among the mango growers. And that resulted remarkably in the project area. About 180 beneficiaries of the SEP project cultivated Maskali on 240 acres of land. About 62.4 tons of Maskalai produced in season(2022), and the market value of this Maskalai is about BDT 54,60,000. Mr. Abdul Motin, a mango producer in Niamotpur, said that he has been contemplating to grow more crops from the same land focused on getting additional economic benefit from the mango orchard. He affirmatively responses that the training of the SEP project makes familiar us about the Maskalai cultivation which is a very eco-friendly, income- generating crop and easy to nurture in a very economical way. At first, villagers discouraged me, saying that it would not be wise to produce crops inside the mango orchard since crops and the Mango would be damaged due to cultivating and irrigating the land for crop production.

Result: But, he tilled the land and cultivated Maskalai there. There was a bumper production of Maskalai inside the orchard and earned around 2 lakhs taka from the Maskalai. After cultivating Mashkalai in the demonstration plots, the application of herbicide was reduced noticeably. According to the data in Chart No. 8, no herbicides were required in the demonstration plots where other orchards used herbicides at 0.7 liters per bigha.

1.1.4. Bio Pesticides Plant

Excessive chemical fertilizer and pesticide use has been noticed as a serious issue in the project area. There is an obvious need for environment friendly farming to minimize the burden of chemical pesticides for sustainable safe mango production. The SEP project has taken many initiatives to solve these problems and establishing Bio pesticide plant is one of them. Two bio-pesticide production centers have already been set up in Sapahar and Niamatpur upazilas. It produces useful bio-pesticides like "Maranasro", "Brahmasro" and "Jivamrata".

Fig: Bio-pesticides production center

Observation: According to the Ghashful SEP ME Md. Bakul Hossain, He produced "Brahmasra" following the advice of project officials and sprayed it in 10-bighas of mango orchard during the flowering period resulted more fruiting and he was interested to continuing this practices as well as suggested others to do so.

Result: Due to this intervention, the mango farmers of the project area are becoming aware of the beneficial effect of bio pesticides, and the amount of use of bio-pesticides is increasing day by day.

Integrated Demo plot

Among the sixty demos two demos are performing in extra ordinary manner because the demo

owners are very keen to learn, take, involve and implement all the innovative technology as per project guideline for example they have collected and raised plantation up to fifty four varieties of mangoes covering areas of sixteen bigahs of land. Where intensive cares have been taken for the establishment of eco friendly orchard by applying the natural farming method. Using bio pesticides and organic fertilizer as per prescription from their own plant following the standardization form in order to improve the soil quality as well as to produce export quality mangoes. Those demos partially are used for learning center for the others micro entrepreneurs. It has a great potentiality to turn it into eco park.

Healthy Environment Development for Local Mango Market

Recently Sapahar becoming the biggest commercial and popular mango marketing center all over the country where several crores of financial transection took place in every mango harvesting season, Niamotpur upazila is also following this scene and this is the prime concern for the revenue department of the Government of Bangladesh. Thousands of people, like mango traders, vendors, and transport workers from different parts of Bangladesh, including local collectors and farmers, gathered, and a huge amount of mango shipment occurred in that marketplace. But there was no proper management system for waste on the other hand existing sanitation facilities also is in poor condition. So to create a good and healthy market environment, the project introduces garbage carriers and public sanitary latrine facilities for two market sites.

Garbage Carrier (Battery driven three wheeler Van)

During the mango marketing season due to the shipment, sorting, grading, packaging, there are a lot of degraded, rotten mangoes, straw and various materials left in the market places, that facilitate to create the unhealthy market environment. For proper management of the wastages and making the market environmentally sound, the project distributed 4 electric battery operated three-wheeled vans (to collect the waste from the market every day) two in the Sapahar Sador Union Parishad and the rest two in the two Environment club of Niamatpur Upazila respectively. Van functionality has been supervised by the concern Union Parishad member, Environment Club member as well as project personnel. Required van driver has been appointed under the supervision of the union parishad and environment club management committee and the puller assigned to collect waste from the market every day and dumps it at a designated place in order to produce the compost fertilizer by the interested compost producers. Necessary repairing and maintenance of the van will be done by the van puller and respective club members.

Fig: Garbage Carrier/ Electric motor driven three wheeler Van

Observation: According to the information provided by the Caretaker of the Motorized Garbage Carrier, around 365,00 kg of waste were collected from the mango market in both Niamotpur and Sapahar Upazila since the functionable of the van up to the reporting period. 28,800 kg of waste were biodegradable, and 7,700 kg were plastic and polythene. And from that, 450 kg of plastic bottles were sold to the local plastic buyer, and 3500 kg of recyclable waste (such as vegetables, fruits, and plant waste) was used for Trico compost production.

1.3. Toilet in the Market Place

Fig: Public toilet in market place

Community facility like the public toilets is the inevitable facility to the floating populations in order to fulfillment of their basic needs. There are no enough toilet facilities in those market places on the other hand the existing public toilets in those markets, particularly in Sapahar, are besieged with severe signs of negligence and mismanagement and which are too much vulnerable to the sources of diseases like typhoid, cholera, salmonellosis, bacillary dysentery, tuberculosis, and parasitic worm infection.

Ghashful SEP Project has established three sanitary latrines and one submersible water pump at the mango market in order to solve the problem of unscrupulous open defecation and to prevent diseases infestation. Mass people enthusiastically accepted the initiative taken by this SEP sub project. The established toilet sites are one in close to the Sapahar new BUS stoppage another one at the Horipur Bazar Mosque premises under the Tilna Union of Sapahar Upazila, and the last one at the Gangor Bazar under the Niamatpur Upazila. A skilled management team comprised of Ghashful project staff, ME, local administration is handling the entire management process, Upazila Nirbahi officer also in picture.

Observation: According to the caretaker of the public toilet, around 100–150 people use the toilet daily. But during the mango harvesting season, the number of daily toilet users is 400–450.

CASE STUDY **The public toilet built under the initiative of the Ghashful SEP project is playing a vital role in improving the sanitation system in mango markets.**

Background:

Recently, Naogaon district has become known as the new capital of mangoes and the heart of mango production. Mango cultivation has almost doubled in the last five years in this district. During the mango harvesting season, various professionals involved in mangoes come from different parts of the country for business purposes. About 40–50 thousand people visit the markets daily. But it is evident that there is no proper planning and management system for the maintenance of so many people in the markets. In such a situation, the sanitation system of the market is the most affected, the environment is polluted, and the traders coming to the market are in danger. Due to a lack of adequate public toilets in the markets, people are forced to use open spaces such as Small shacks, sidewalks, roads, under trees, or unsafe toilets. As a result, diseases like typhoid, cholera, dysentery, and tuberculosis are spread by many germs or bacteria. To solve these problems, the Ghashful SEP project decided to construct public toilets in mango markets based on baseline survey data, local-level observation, and public opinion. As part of the project, community consultation was conducted with local public representatives, upazila administration, market committee, mosque committee, farmers, and local people regarding the construction of public toilets in Sapahar and Niamotpur upazilas. In community consultations discuss the need, usage rules, and benefits of public toilets. The opinion of the local community is taken into consideration regarding the selection of the location of the public toilet and the formation of the public toilet management committee.

SEP Project Involvement:

On June 25, 2022, the construction of a total of 3 public toilets, one at the adjacent of the new bus stand of Sapahar Upazila, one at Haripur Bazar of Tilna Union, and one at Gangor Bazar of Rasulpur Union under Niamotpur Upazila, was started under the project's assigned intervention. In presence of Sapahar Upazila Nirbahi Officer Mr. Abdullah Al Mamun and Upazila Vice Chairman Mr. Abdur Rashid, the public toilet with submersible pump construction at the new bus stand of Sapahar Upazila was inaugurated.

Ghashful entrepreneur Mr. Md. Abdur Rashid is in charge of the maintenance of public toilets built in Sapahar market; maintenance of public toilets built in Haripur market is handed over to the Haripur Bazar Jame Masjid Committee; and maintenance of public toilets built in Gangore Bazar is handed over to the Banik Samiti. Ghashful Branch Office, Sapahar, and Niamotpur are kept in charge of round-the-clock monitoring. At present, three public toilets are functional. Buyers and sellers coming to

Sapahar Upazila Nirbahi Officer is inaugurating the public toilet.

the local market are using it with satisfaction. Three caretakers have been appointed by the Ghashful's Entrepreneurs, the Banik Samiti, and the Masjid Committee to maintain these toilets. Operation and maintenance costs are being met by collecting nominal money from public toilet users.

Outcome of the functional Public Toilets :

1. The sanitation system of the mango market as well as the behavior of the users is being improved.
2. Currently, around 100–120 people are using public toilets daily in off season and Around 400–450 people are being benefited from this public toilet during on season (mango harvesting season).
3. Employment opportunities has been created for three people.
4. Now a days all the mango value chain actors are willing to use this safe and risk-free public toilet.

Marketing Channel Development

Website/E commerce site Development

Mango farmers in Sapahar and Niamatpur traditionally sell their mangoes at the local village market. Due to the lack of knowledge in selling the mangoes in premium market, they often face losses. Most local traders buy mangoes at 48-52 kg instead of 40 kg per Mond for more profit. As a result, mango farmers are facing a lot of financial losses. Ghashful SEP Project has developed a website to create and enable their access to the premium market. The e-commerce site website https://www.ghashfulborendro.com has been setup to support and expand the digital marketing skills of micro-entrepreneurs in order to get the competitive advantage nationally and internationally at the premium market. Through this website, entrepreneurs can sell mangoes in all parts of the country at a fair price. Due to utilization of this e -platform entrepreneurs will be able to become economically self-sufficient by selling diversified mango products (pickle, chutney, jam, jelly, bar) and eco-friendly agricultural inputs (Vermi and Trico compost) along with other fruits and vegetables. In addition, micro-entrepreneurs can sell their products with handsome profit through this e-platform compared to the physical marketing with low cost along with standard branding facilitates

It has been expected that around 800 project entrepreneurs will be benefited directly through this website due to the course of project works.

1.1.2: Initiatives to increase Eco Labeling and Access to Premium Markets, (safety Standards, and certification/standard)

On the way to the purposes of enhance and extend knowledge, skill on product branding, certification, government protocol, how to enter at the premium market, negotiation and liaison with concern organizations due to this concern, - the project organized workshops, orientation for Mango farmer in order to build linkage with concern authority. The

Fig: Home page of Ghashful Borendro website

project also supports microenterprises to meet environmental quality standards based on the customized national/international standards for every production. During this process several high quality experts were invited to carry out the workshop for example, expert from the BSTI, DAE, Health sector, Department of Environment, RHRC, BRDA as well as from the other renowned private sector service providers etc. those which are too much affirmative in these sectors.

Result: Due to this course of actions project leverages the entrepreneurs to take part in the international market which authentically demonstrated unpredictable circumstances. Underlying graphs shows the details explanation.

1.1.2.i: Workshop on Environmental Certification

Very recently Sapahar and Niamatpur upazila is being recognized throughout the country for delicious mango production center for example Amropali, BARI -4, Banana etc. But compared to the other parts of the country, the mango export rate is zero. The main reason for this is that the farmers in this area have zero knowledge of orchard management following the GGAP, lack of awareness on government policies on pest control using modern technology, insufficient knowledge on environmental practices for improving the environmental eco-system. Under the initiative of the Ghashful SEP project, a series of workshop were organized on getting environmental certificates in Niamatpur and Sapahar upazilas with the aim of creating environmental awareness and obtaining certificates in terms of product production, transportation which is naturally representing the, GGAP, GHP and GMP. Through this workshop, 445 micro entrepreneurs (Table no: 6) from two upazilas became aware regarding the protocol for obtaining government clearance on environmental issues on product production, transportation, and marketing. In order to export the fresh and produced products in the country and outside the country below key features have been discussed: such as:

Fig: Environmental Certification workshop

- Sanitation procedures from the product production stage to marketing, such as; cleanliness of enterprises; health awareness of workers during product production period;
- Being informed about the improved environmental practices such as safety health measures for example use of face masks, gloves, gumboots; provision of first aid box; provision of clean toilets; keeping the use of chemicals to health-tolerable levels, etc.

SL/No	Location	Male Participants	Female Participants	Total No of Participants
01	Sapahar	178	124	302
02	Niamotpur	87	56	143
03	Total	265	180	445

Table no 6: Number of participants attended at the environmental certification workshop.

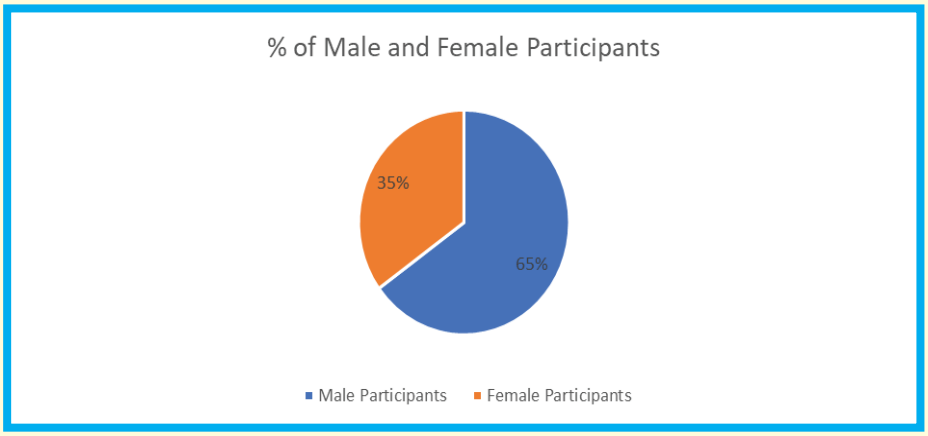


Chart 9: Ratio of male and Female participants at the Environmental Certification workshop.

Observation: Among 445 participants, 302 participants from Sapahar Upazila and 143 from Niamotpur Upazila fulfilled their workshop on Environment certification, where 68% were male participants and 32% were female (Chart no 6). Ghashful SEP project ensured at least 32% female involvement in any development activities, including having training, workshop, and hands-on training enterprise development. Now, males and females are eager to practice good practices in their enterprises.

Result: Micro-entrepreneurs are started to get accustomed by environmental practices in their enterprise. In the initial stages of project, there were about 0% percent people who has the facilities like having fast aid box in their enterprises and after intervention of SEP project 90% entrepreneurs are practicing this and continuing. Not only using mask and gloves in the enterprises but also emphasizing on worker health care as well which is increasing significantly within and outside the enterprises in an alarming rate. In total a list containing of 32 people submitted to the Department of Agriculture Extension Office for phyto sanitary certification and this certificate will help them to enter into the premium market focused on exports.

1.1.2. ii. Workshop on product certification

There are total fourteen in numbers of Product certification workshops have been facilitated by the SEP project in Sapahar and Niamatpur Upazilas respectively and due to these 453 micro-entrepreneurs gather knowledge about the protocol of obtaining the certificate for products produced by entrepreneurs.


Fig: Product Certification workshop

In the workshop, entrepreneurs are informed about Good Agricultural Practices (GAP), Good Handling Practices (GHP), and Good Manufacturing Practices (GMP). Experts discuss the safe production and handling mechanism of mangoes and mango based products in all the segment of production process for example:

- Worker hygiene practices, sanitation facilities, pest control, and prevention of physical and chemical contamination,
- Also discussed about the environmental control, food process control, product storage and transportation management,
- Certification process likely are ISO, HACCP, BSTI and its protocol etc.

Table no 7: Number of participants attended at the product certification workshop

SL/No	Location	Male Participants	Female Participants	Total No of Participants
01	Sapahar	113	158	271
02	Niamotpur	135	47	182
03	Total	248	205	453

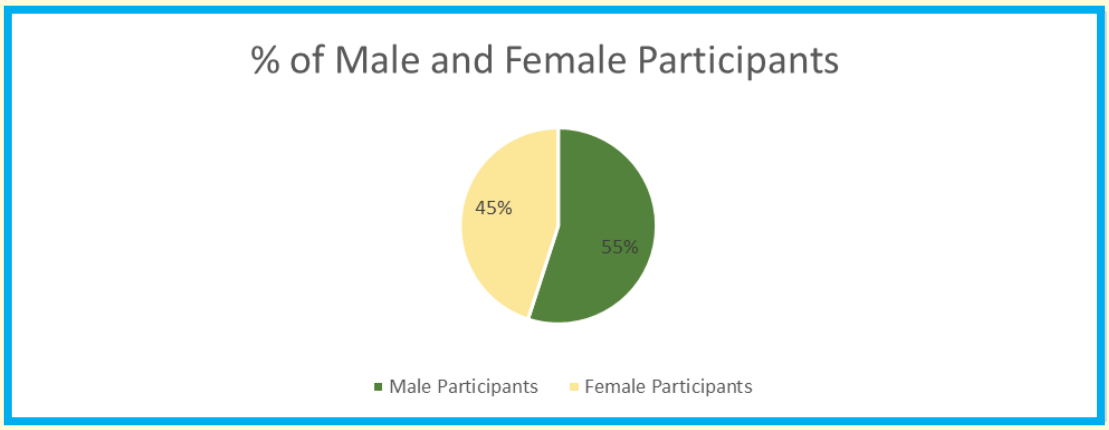


Chart 10: Ratio of male and Female participants at the Product certification process

Observation: There are four hundred fifty three micro-entrepreneurs who are well-informed about the acquiring process and benefits of product certification for small enterprises. As per the Ghashful SEP project target, 18 product certification workshops in Sapahar and Niamotpur Upazilas have been conducted respectively. The project has guaranteed 45%(Table:7) female participation in the workshop. Subsequently, that made a beneficial impact on the women empowerment process in the project area. They have been encouraged by the project to build small factories for producing mango products, such as mango bars and pickles, under the supervision of the SEP project.

Result: Due to this intervention four entrepreneurs got a Sanitary certificate (SC) and one entrepreneurs got BSTI certificate.

1.1.2.iii. Business Certification

Ghashful's SEP project heart and soul is trying to ensure the100% business certification (Trade license) for all the micro-entrepreneurs. Because it is an essential requirement for the start up business; otherwise, enterprises will not be eligible to do business. This certificate will help to grow the business through increased revenue, recognition, and financial assistance by gaining low-interest loans and grants from the different leasing company.

Observation: To fulfill the SEP project target, six business certification workshops have been organized in the project area where the experts discussed in detail all kinds of regulations in the field of mango export, such as sorting, grading, and packaging of mangoes, about the rules for obtaining a trade license, the rules for taking membership in BFVAPEA, the rules for obtaining an export-import license, and how to internationalize the business.

Fig: Business Certification workshop

Result: Ghashful SEP project hab already ensured 62% trade licenses for the micro entrepreneurs.

Table no 8: Number of participants attended at the business certification workshop

SL/No	Location	Male Participants	Female Participants	Total No of Participants
01	Sapahar	55	26	81
02	Niamotpur	59	10	69
03	Total	114	36	150

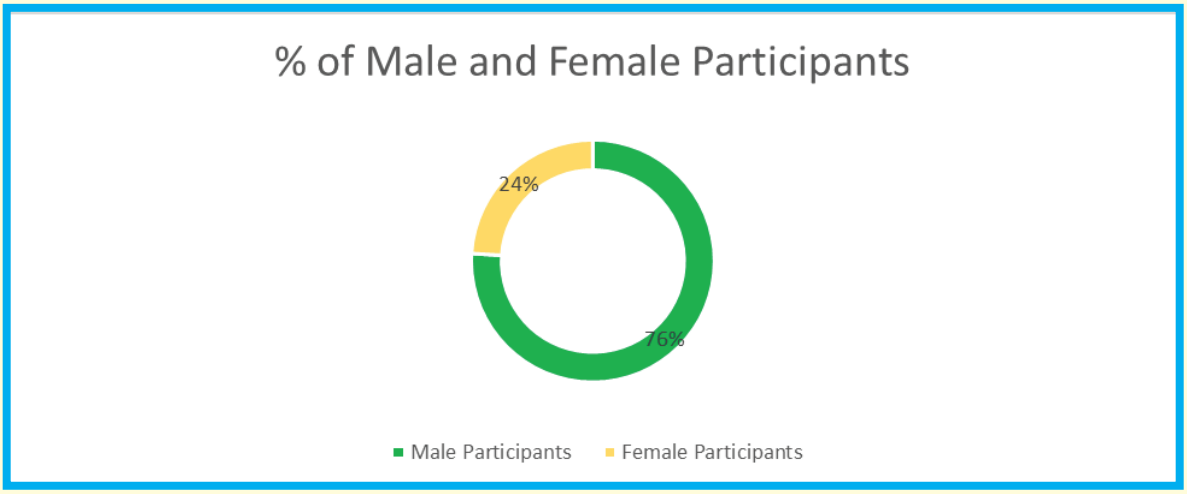


Chart 11: Ratio of male and Female participants at the Business Certification workshop

Explanation: One hundred fifty participants were present in this Business certification workshop, where 81 participants were from Sapahar, and 69 were from Niamotpur Upazilas. And of them, 76% male and 24% female participants.

1.1.2.iv Bargaining and knowledge sharing workshop

Agriculture sector plays a vital role in the Bangladesh economy which has great contribution in the GDP. Most of the people here are closely related to agricultural works for their livelihood. Agricultural modernization is the key source of poverty alleviation in this Borendra tract. Generally, farmers have insufficient knowledge on how to sell and buy the product with win-win method. With no or less bargaining power, farmers face inequality during selling and purchasing the products.

Fig: Bargaining and Knowledge sharing workshop

The Ghashful SEP project has worked on to improve the capacity of the farmer in order to increase the bargaining power. The SEP project has organized three bargaining workshops in the project area. About 90 farmers attended those workshops. Participants were active in the workshop and learned about market policy and marketing strategies through those workshops. Due to gradual increasing the bargaining power through the workshop, farmers in the project area are now able to compete with the counterpart focused on economic development. And that leads to changes in their production, investment, and marketing decisions. Now they tend to invest more, sell in larger quantities locally and internationally, invest in productive assets, adopt new agricultural technologies, switch crops, or cultivate cover crops in their orchards.

Result : Due to to this intervention, total 77mt of different varieties of mangoes have been exported during this project period through the project beneficiaries.

CASE STUDY

Md. Ziaur Rahman in environmentally friendly mango cultivation

Entrepreneur : Md. Ziaur Rahman
Father Name : Md Ramzan Ali
Address : Jaipur, Sapahar
Member No. : 139
Branch : Sapahar, Ghashful
Organization : Ghashful

Image: Mangoes are making ready for export

Background

Md. Ziaur Rahman is a resident of Jaipur village belonging to the Sapahar upazila. On January 19, 2021, he became a member of Ghashful and received a loan of Tk 500,000 from the organization's SEP project and invested in the mango orchard. After hearing the SEP project goals, he determined to develop his capacity for eco-friendly mango orchard management by receiving training from the Ghashful SEP project.

Involvement with the SEP project:

Md. Ziaur Rahman is a mango orchard owner. In 2013, he started a mango orchard by cultivating mangoes on a very small scale on only 10 bighas of land. Earlier, he was employed in a private company. Through this mango cultivation, along with his economic development, he decided to end his working life and become an entrepreneur. At present, the size of his mango orchard is 162 bighas. His mango orchard project is running in different areas of the upazila. But in all his orchards, mangoes are grown in the so-called/traditional method. After that, on January 19, 2021, he took total Tk 5,000,000 loan from the SEP project and invested in mango orchards. Later, he took Tk 3200000 in four cycles and invested in mango orchards. Before his involvement with the SEP project, his mango orchard management was underdeveloped. Then, while taking a loan from the organization, he promised to implement environmental development activities in mango orchards. With the aim of eco-friendly mango orchard management, as promised, he is committed to following and implementing all the social and environmental practices related to the SEP project for the overall development of his mango orchard, as he has been trained in various aspects of modern mango orchard management and the certification under the SEP project.

Regarding the implementation of environmental practices as promised, Md. Ziaur Rahman said, I used to follow the so-called method in mango cultivation. Currently, he is tending the orchards according to good agricultural practices (GAP). For example, fencing of orchards, provision of first aid, organic mango cultivation, use of pheromone traps, fruit bags, etc. Moreover, he willingly participated in various trainings, workshops, seminars, and knowledge exchange visits organized under the initiative of the SEP project. As a result, he learned about scientific methods to prevent insects and got acquainted with improved and climate-tolerant mango varieties. He also learned about the various modern and environment friendly methods of mango orchard management and marketing. Consequently, with the implementation of these methods, the

demand for mangoes produced in his garden in the market is higher than the mangoes of other gardeners. According to him, Last year (2022) he has sold 6 tons of Amrapali mangoes from his garden to the office of the Prime Minister of the People's Republic of Bangladesh with the help of the Ghasful SEP team, and then the Bangladesh government sent those mangoes as gifts to the heads of state of different countries. In the current season(2023), he also sold 20 tons of mangoes in Europe and Asia. In these circumstances, he also mentions that Ghashful SEP project connects him with exporters. In addition he also notifies that he has been benefited a lot from this and feels proud of himself. Nevertheless, other mango growers in his locality now are asking him for advice on environmental mango orchard maintenance focused on GGAP, which increases his acceptance in the area.

Commitment to the implementation of environmental practices:

when awarded the SEP loan, Md. Jiaur Rahman made several promises to improve the environment of his mango orchard. The promises are as follows:

1. Arrangement of a first aid box for primary health care
2. Provision of separate areas for workers/employees to rest and take food in mango orchards
3. Development of drains around the work site.
4. Mangoes will be produced through natural/organic methods. Use of environmentally friendly inputs.

Implemented environmental practices Activities:

Md. Jiaur Rahman has implemented all the promises he made to improve the environment of his mango orchard while taking the SEP loan. At the same time, he is committed to tending the garden while keeping in mind other environmental issues. The commitments implemented are as follows:

1. Provision of personal protective equipment (PPE) in the workplace of workers.
2. A first aid box has been arranged for primary health care.
3. Separate areas are provided for rest and food intake for workers in mango orchards.
4. Improve drainage system around the orchard.
5. Producing mangoes through natural or organic methods.
6. Has arranged a designated place for garbage disposal (a dustbin).
7. Hanging awareness notices on health protection and safety measures at appropriate places.

1.1.2.v. Environment club

Fig: Monthly Meeting of Environment Club

Under the Ghashful SEP project, six environment clubs have been formed. It would act as a threshold for the project intervention and continuous promotion of this platform would create awareness among the mango value chain actors regarding the project goals and objectives in the project area. Of six clubs, three are in Sapahar Upazila, named Bagan Bilash Environment Club, Jabaibil Environment Club, Haripur Surjomukhi Environment Club on the other hand Khamarbari and

Shapla Environment Club under Niamotpur Upazila and finally the last one is Nirmoil Environment Club under Patnitola Upazila all are belonging to the Naogaon District. There were 142 meetings held and active participant were 2898 during the project period. All the environment club mainly deals with the project intervention focused on project goals and objectives, such as:

- Discussed about the improved environmental practices and how to produce safe mangoes,
- Local mango growers are encouraged to follow eco-friendly method in mango orchard management in order to produce safe mango strict to the GGAP.
- Modern agricultural technologies such as mango bags, pheromone traps, yellow/blue traps, and organic fertilizers rather than chemical fertilizers are encouraged to conserve soil nutrients.
- Discuss about the benefits of cover cropping within the orchard, organic fertilizer production and preparation methods, and nursery development.
- And the members are encouraged to produce mango products to increase the multi-purpose uses of mangoes.
- Access to premium market including export market mechanism also discussed,

Result: Monthly environment club meetings are being organized regularly so that it can accelerate the inter and intra farmer groups interaction on safe mango production. This intervention provides a unique opportunity to promote adopting environmental practices and modern technologies.

Table no 9: Target and achievement of sub activities under eco-labeling and access to premium markets.

Sl.No.	Sub activity	Total Project Target	
		Target	Achievement
1	Environmental Certification, (Workshop, Training, Orientation)	18	18
2	Product certification, (Workshop, Training, Orientation),	18	18
3	Business certification (Workshop, Training, Orientation),	6	6
4	Environment club establishment	6	6
5	Bargaining and knowledge sharing workshop	3	3

1.1.3: Capacity Building of the POs

1.1.3.i: Training, Meeting, Workshop and Seminar:

PO capacity building also is one of the crucial parts of the project. Besides developing the ME capacity (Micro-entrepreneurs), the SEP project has ensured that all the Project staff as well as the project unit staff of the two branches Niamotpur and Sapahar are well informed about the project goals and objectives. SEP project has conducted twelve project unit staff workshop and one training where all the participants were informed about SEP project goals and intervention techniques during the training session. Staff have been learned about the basic steps of safe mango production, GGAP, GHP, GMP, phytosanitary certificate, branding, export support,

Environmental improvement practices, adaptation, best practices, impacts, and reporting patterns. Also, they grasp the benefits of climate-tolerant mango seedlings and eco-friendly inputs and their uses (fruit bags, traps, organic fertilizers (Trico and Vermi), production, and utilization.


Fig: Project unit staff training

1.1.3.ii: Exchange Visit (Project Staff):


Fig: Field level entrepreneur visit

Developing the capacity and understanding of SEP project objectives and goals, Ghashful Sustainable Enterprise Project (SEP) organized a 4-day exposure visit for experience gathering, knowledge sharing as well as to understand the best practices at Khulna and Satkhira District for the Ghashful SEP team member.

During the visit, the Ghashful SEP team visited mango exporters' export oriented mango orchards, Organic Fertilizer Production Center, Local Fruits and the Vegetable collection center, village super market, Processing center and attended meeting sessions with different Government Officials, NGO Staff, and the owner of the processing center. They have been introduced some technologies used in mango production (Mango Harvester Machine), treatment plant (Hot Water Treatment), and storage (Cold Storage, Fast Freezing machine) and their work and functionalities. Eventually the knowledge and experiences which have been earned during the visit assume to be necessarily beneficial for the implementation of the Ghashful SEP sub project.

Sub Component 1.2: Capacity development of MEs,

1.2.1.i: Borrower Training

As per agreed project proposal Partner Organization like Ghashful has been trying to capacitate entrepreneurs directly through highly qualified trainers, technical assistance providers, and mentors. The project has targeted to provide training total 800 mango farmers through training sessions on different topics likely are Environment-friendly mango production and pre-marketing activities, diversified mango product production, and organic fertilizer and Bio pesticides production


Fig: Borrower training program

and uses, Compost fertilizer production and environment friendly orchard management etc. Subsequently, farmers from the project area are being well informed about environmental practices through the training session in order to produce the safe and health friendly mango along with the improvement of the environment.

Table no 10: Number of participants attended at the borrower training.

SL/No	Location	Male Participants	Female Participants	Total No of Participants
01	Sapahar	237	156	393
02	Niamotpur	241	99	340
03	Total	478	255	733

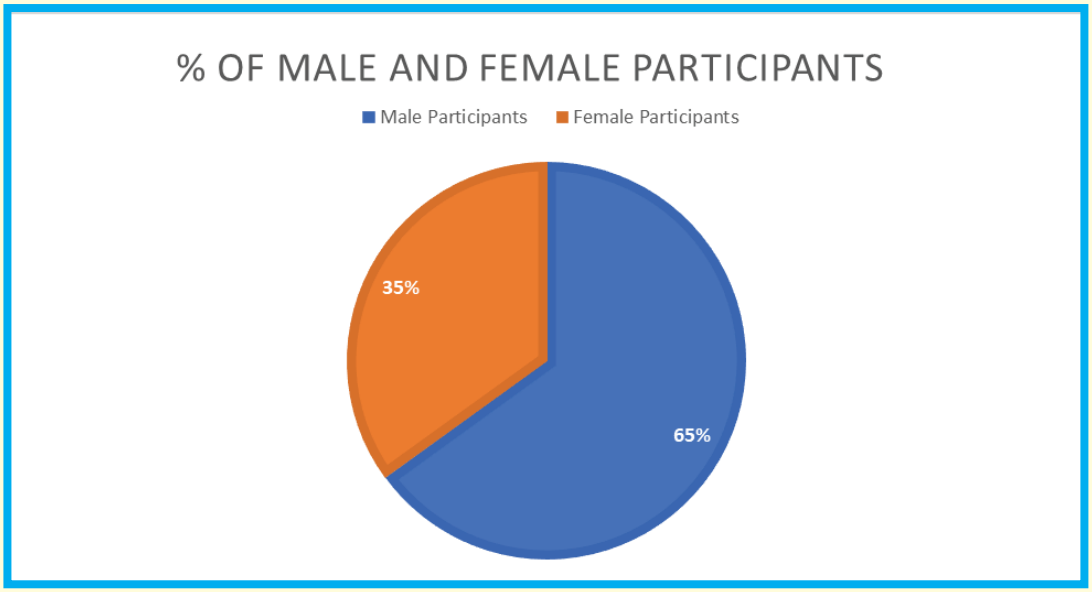


Chart 12: Ratio of male and Female participants at the Borrower training session

Observation: Total 32-borrower training courses have been conducted during the project time frame and the total number of Micro entrepreneurs 733 have been trained in respect of environment safety production.

Result: The project aimed at improving environmental conditions and production by utilizing the knowledge obtained from the training/best practices especially focused on environmental practices. Due to the intensive training session micro entrepreneurs are spontaneously interested to participate at the intended project works like exchange visit, environment club meeting, seminar, workshop, exhibition, day celebration etc. On the other hand, due to the training farmers are able to solve the problem, improving their negotiation skills, adopting environmental practices and modern technologies. and other relevant issues that arose. Nevertheless, farmers are reducing their reliance on chemical (Insecticides and Fertilizer) uses by increasing the bio pesticides and compost fertilizer. The project relentlessly is trying to improve the soundness of mango farmers on uses of agro-technology through hands-on training, while environment resilience is supreme concern.

1.2.1.ii: Workshop/Seminar

At the inception stage Project has facilitated "Project Launch workshop" both of the project site owing to propagate project goals, objectives as well as impact among the stakeholders. In this connection all of the mango value chain actors have been invited at the workshop session. For example, Upazila Nirbahi officer, Upazila Chairman, MEs, PO officials also at the scene.


Image: Project Launch workshop

1.2.1.iii: Exchange Visit

This is also one of the major interventions under oject which is trying to develop micro-entrepreneurs' capacity by engaging series of different type of courses, for example, networking to improve services, knowledge transfer, connectivity, policy, and culture within the entrepreneurial ecosystem.


Image: Knowledge sharing visit

As per SEP project theme, the sub project was designed to broaden the farmer's perspective on agriculture through an exchange visit so that they could easily adopt the environmental best practices focused on environmental stability and sustainability as well as economic improvement.

Observation: During the entire project period, a total number of 6 exchange visits were organized as per the project objectives, and 151 micro-entrepreneurs participated in those exchange visits. On those visits, participants got the opportunity to visit the Fruit Research Institute, Exporter, International trade fair, Specialized Cold Storage in Rajshahi, Chapainawabgonj, the Regional Horticulture Research Station, Horticulture Center, and the Bangabandhu Mango Museum.

Result: Through those exchange visits, entrepreneurs acquired information about fruit cold storage, central packing house, new varieties of high-value mango seedlings, how to linked with the high quality technical person, knowledge about eco-friendly orchard management which were unknown before. That on site activities also help them building common understanding, exchange experiences, and willingness to adopt new approaches. It also encourages them to adopt new environment friendly technology in their business.

1.2.1.iv: Printing, Publication and Exhibition

Ghashful SEP project has conducted a two days Safe and Health Friendly Mango Fair_2022 at the Nawjoan field, Naogaon dated on June 28 & June 29, 2022 and which was inaugurated by Mr. Shihab Ryhan, ADC, Naogoan. There are total 18 Micro entrepreneurs participated at the fair along with 18 different varieties of mango. Here different types of Mango product like mango pickle, bar etc also were demonstrated along with the main products.


Image: Safe and Health friendly mango Fair_2022

Different types of high yielding and climate resilience late and early varieties of seedling also demonstrated there. Approximately 20,000 – 25,000 turn out were at the scene.

In this connection Ghashful once again conducted a five days "Mango and Mango Based product fair-2023" at the Nawjoan field, Naogaon dated from June_19 to June_23, 2023. This year District Administration, Naogaon and Ghashful jointly organized the exhibition.


Image: Mango and Mango based product fair_2023

This exhibition was inaugurated by the honorable Deputy commissioner Mr. Khalid Mehedi Hasan, BPAA, Naogaon and chaired by the honorable Deputy Director Mr. Md. Abul Kalam Azad, Department of Agriculture Extension, Khamarbari, Naogaon. Total number of stall were 30, here twenty-five stalls were occupied by the micro entrepreneurs and rest belonged to the Agriculture Extension Department, Naogaon. There are about fifty types of different high yielding varieties of mangoes (early and late) and seedlings were demonstrated by the promising entrepreneurs. On the other hand, two newly born certified mango based product producers also demonstrated their safe and hygienic product like are mango made pickle, jam, bar, jelly etc. Approximately more than one lakh turns out took place inside the exhibition ground.

On the other hand, total 6500 banner, leaflet, poster, awareness signs etc. printed and distributed inside the project ground within this project time frame as per plan.

Sub Component 1.3: Investment in Revenue Generating Common Services.

Common Service is such an activity where the people living remotely could avail financial access with low interest rate without facing any hurdle. For this the entrepreneurs could engage different type of income generating activities focused on economic development resulting product availability with affordable price within the community.

Objective of the Common Service Loan:

- Easy access to finance with low interest rate and with minimum protocol,
- Stimulate the expansion of income generating activities,
- To make availability with affordable price of produced product within the community,

Table 11: List of Revenue Generating Common Service Loans

Sl/No.	Description (Services)	No of ME (Beneficiaries)	No of Agreement
01	Mango Nursery Development	19	22
02	Organic Fertilizer Production	13	17
03	Input Supplier Development	13	18
04	Safe Mango Sale Center Establishment	12	15
05	Diversified Mango Product Production	20	29
	Total	77	101

1.3.i: Mango Nursery Development, **1.3.ii: Organic Fertilizer Production,**
1.3: iii: Input Supplier Development, **1.3.iv: Safe Mango Sale Center Establishment,**
1.3.v: Diversified Mango Product Production

1. 3.i: Mango Nursery Development

Majority of the Inhabitant of Sapahar and Niampur Upazila under Naogaon district are involved in the agricultural value chain because of their livelihood and here most of them are specifically involved in mango cultivation and related business. Mango growers usually depend on local or anonymous nurseries for the seedlings for the to establishment of new mango orchards. If the saplings had to be collected from different parts of the country, the cost of the saplings including transportation costs would be very high. Moreover, to get a suitable variety of high-quality, high-yielding as well as climate resilience seedlings many nursery business Men often deceives with the orchard owner. It seems that it is difficult to trust the sapling seller which could jeopardize the owner business plan.

For modernization of nursery business Ghashful SEP project distributed BDT 22,00,000 among 19 entrepreneurs through twenty two agreement under common service intervention which include improved and high-yielding varieties, climate resilient mango seedlings. Under the project's initiative, high-yielding mango seedlings of indigenous and foreign varieties are distributed to each nursery. Distributed seedling varieties are for example; Miyazaki, Alphanso, American Palmer, Kyuzai, King of Chakapat, Blackstone, Banana, Bari-4, Bari-11, Bari-13, Gourmati etc. Now a day's new orchard establishment expansion is continuing by planting saplings separately according to the newly acquainted variety. Through regular training, motivation, and monitoring micro entrepreneurs are becoming interested to establish new orchard with the climate resilience varieties. For decoration the nursery owners are right now using nameplates for variety identification, making separate block, using tag etc. Entrepreneurs are using organic fertilizers and organic pesticides for the production of environment friendly seedlings production. Different environmental improvement practices like are Face masks, sunglasses, aprons, hand gloves, and gumboots are being used for workers' health awareness. Scions are collected and grafted by skilled workers. Dustbins are being arranged to dispose of garbage in specific places instead of littering everywhere.

Fig: High yielding mango varieties development

Due to the SEP project intervention acceptance of nursery business is increasing among the orchard owner inside the project ground as the volume of seedling sales increases. By doing this, the entrepreneurs are benefited economically and also increases the governmental revenue.

1.3.ii: Organic Fertilizer Production

There are 30,000 farmers engaged in the cultivation of different varieties of improved and high-yielding mango cultivars at Sapahar and Niamotpur Upazila under Naogagon district. Farmers usually use a huge volume of chemical fertilizer in order to maintain the balance diet for the trees

and to get a competitive yield. Most mango farmers in Sapahar and Niamatpur Upazilas use large amounts of chemical fertilizers instead of compost fertilizer (in proportion) on their land while producing mangoes and it is very much dangerous for the environmental ecosystem. As a result of the unscrupulous uses of chemical fertilizers, soil structure and its fertility are deteriorating day by day. Ghashful SEP project under its one of the major interventions like, common service loans are being provided to encourage the mango farmers of Sapahar and Niamatpur area to increase production and uses of organic fertilizers to protect the soil environment as well as entire environmental ecosystem.

Fig Development of organic fertilizer plant (Vermicompost)

In order to expand the use of organic fertilizers, the Ghashful SEP project Common Service Loan has been distributed to 13 entrepreneurs through seventeen agreement for a total of 850,000 Taka. As a result of which 20 tons of vermicompost and 10 tons trico compost fertilizers are being produced every 45 days and total production in 2022 attached in Table no: 12. Under Non-Revenue Generating Physical Activities, four bio-fertilizer production plants are being set up at Sapahar and Niamatpur upazilas. It will produce 4 tons of vermi-compost and 12 tons of trico-compost.

Due to the interventions undertaken by the project, the mango farmers of the project area are getting to know about the benefits and necessity of bio-fertilizers, and the habit of using bio-fertilizers is being developed among the entrepreneurs. In this context, local input supplier from Sapahar area Md. Rezaul Karim said that the amount of bone meal sold this season (2022) has not been sold in the last 5 years. According to their information, about 15 tons of bone meal and 20 tons of vermi-compost and trico-compost were sold in 2022. (Also see table no:13)

Table No 12: Information on the production, use, and sale of compost-fertilizers at the entrepreneur level.

SI/No	Products	2020-2021				2021-2022				2022-2023			
		Production amount (kg)	Sales Amount (kg)	Used in own enterprises (kg)	Gross income (BDT)	Production amount (kg)	Sales Amount (kg)	Used in own enterprise (kg)	Gross income (BDT)	Production amount (kg)	Sales Amount (kg)	Used in own enterprise (kg)	Gross income (BDT)
01	Vermi Compost	0	0	0	0	18000	10000	8,000	144000	42000	25200	16800	453600
02	Trico-compost	0	0	0	0	27000	11500	15500	217000	45000	32800	12200	393600
	Total					45,000	21,500	23,500	3,61,00	87,000	58000	87000	847200

According to the entrepreneurs," by producing organic fertilizers, not only they are benefitted financially but also able to meet the demand.

The popularity of the production and use of organic fertilizers instead of chemical fertilizers is increasing in the project area. The Ghashful SEP project is also promoting its marketing within the project area in deed. As a result, the economic development of entrepreneurs is taking place, and the demand-supply of organic fertilizers among the mango farmers is also increasing and it is necessarily playing a significant role in the positive environmental development of the project area.

CASE STUDY

Entrepreneurs are benefiting from the production of organic fertilizers

Entrepreneur: Md. Iqbal Hossain
Father: Md. Mujibul Haque Chowdhury
Member No. 82
Branch: Niamatpur, Ghasphul
Organization: Ghassful
Address: Niamatpur, Naogaon

Md. Iqbal Hossain is a resident of Niamotpur village in Niamatpur upazila. On June 21, 2021, Md. Iqbal Hossain became a member of Ghashful and participated in various trainings and workshops organized by the Ghassful SEP project. Especially after attending training on bio-fertilizer (vermicompost and trico-compost) and organic pesticides, he decided to set up a plant on organic fertilizers for much production.

Previously, he had only a few domestic animals at home, such as chickens and cows. His financial crisis was not going away in any way. Family Running, a family of five members was difficult for him. In this situation, his participation in the training of the Ghashful SEP project inspired him to produce bio-fertilizers and he decided to set up a bio-fertilizer plant. According to the entrepreneur, Mr. Ekbal Hossain, initially he had no technical knowledge of building a bio-fertilizer plant. Then he approached the Ghashful SEP team and expressed his interest. The Ghashful SEP team provided him with all kinds of technical assistance in organic fertilizer production, and through them he came to know that Ghashful provides financial support for organic fertilizer production under the common service loan. After that he applied for a loan to build a bio-fertilizer plant and got a loan of Tk 50,000. He invested that money according to plan and built a vermicompost plant with a 5-ton capacity. Ghashful - SEP project assist him to buy about 2.5 kg of earthworms in order to start the production.

BDT 750000 is spent on the infrastructure of the plant. The demand for cow dung is met up from his farm. Currently, he owns three cows; his mother has four cows; and his brother has two cows. They have about 10–12 cows in their house throughout the year. Earlier, cow dung was piled up next to the homestead. Some of this dung was used as organic fertilizer on agricultural land. And most of them were unused and left as garbage. There was no use.

Since the introduction of organic fertilizers, dung, which was left as waste, has now become a source of income. At present, 2.5 tons of vermicompost are produced in one cycle (45 days) from seven compost plant houses. Varmicompost fertilizer is being sold at Tk 800 per 40kg. According to this, the price of Varmicompost fertilizer is 50 thousand taka per cycle.

According to him, when he started this organic fertilizer plant, some of his neighbors discouraged him. Working with dung was somewhat frowned upon. And told him it was a total waste of money. But he stick to fertilizer production at the suggestion of the SEP project. Initially, about 800 kg of fertilizer are produced. From there, he sold about 300 kg of fertilizer for 6,000 taka. Rest of it he used in his cropland. Ghasful SEP Project was guiding him for marketing. In the meantime, many mango farmers in Niamatpur and Sapahar upazilas have contacted for purchasing the organic

fertilizers. Now 2-3 tons of fertilizer are being sold every month. Presently he has the plan to increase the production capacity of his existing plant. Neighboring people now asking him for advice on building organic fertilizer plants.

As an entrepreneur in agriculture, he uses this organic fertilizer to maintain soil quality in his garden. He realized that compost is the lifeblood of the soil for any crop. Organic fertilizers increase crop production and improve quality of crops. He encourages other farmers in his locality to produce and use organic fertilizers in their orchards focused on safe crop production.

1.3: iii: Input Supplier Development,

Traditional trends of the Micro entrepreneurs under project area rely on local input suppliers for fertilizer and pesticides. Input suppliers suggest using more fertilizers and pesticides than required in the hope of more significant profit. As a result, mango farmers are facing financial loss and resulting environmental pollution. Ghashful is providing financial assistance by disbursing total amount of BDT 31,50,000 soft loan among the 13 input suppliers in project area through eighteen agreement and advising them promoting the sale of organic fertilizers and organic pesticides. An eco-friendly agricultural inputs corner has been created at the display center of every input supplier to make eco-friendly agricultural products readily available for the customers. Facilitating linkage in order to build sustainable rapport with input suppliers and companies are producing mango bags, pheromone traps, yellow/blue traps, bio fertilizers, and bio pesticides. As a result, eco-friendly agricultural inputs are becoming more accessible to input suppliers. By doing this, the input suppliers are benefited financially as well as the farmers, who are also contributing in the environmental development effort in a great extent.

Fig Input supplier facilitation

According to the input supplier, eco-friendly agriculture products, such as mango bags, pheromone traps, organic fertilizer and pesticides sales rate increasingly increase after the intervention of the SEP project.

Table No 13: Environment Friendly Agriculture Products Sales by Input Suppliers

Sl/ No	Product Category	Year			
		2020	2021	2022	2023
01	Organic Fertilizer (Kg)	500	8700	35000	48000
02	Fruits Bag (Pieces)	0	25000	605000	1150000
03	Pheromone Trap(Nr)	0	400	1100	2800
04	Yellow/Blue Trap(Pieces)	0	0	250	780

Observation: As per collected data have been revealed that input supplier's aspiration of purchasing and selling of environmentally product are increasing day by day. According to the data in table 13, it can be seen that in 2023, they sold 48,000 kg of organic fertilizers, 11,50,000 pieces of fruit bags, 2800 pieces of pheromone traps, and 780 pieces of yellow traps. In 2021 and 2022, the sales of safe agricultural materials are increasing by the day. In 2020, only 500 kg of bio-fertilizer is sold, which is very insignificant compared to today.

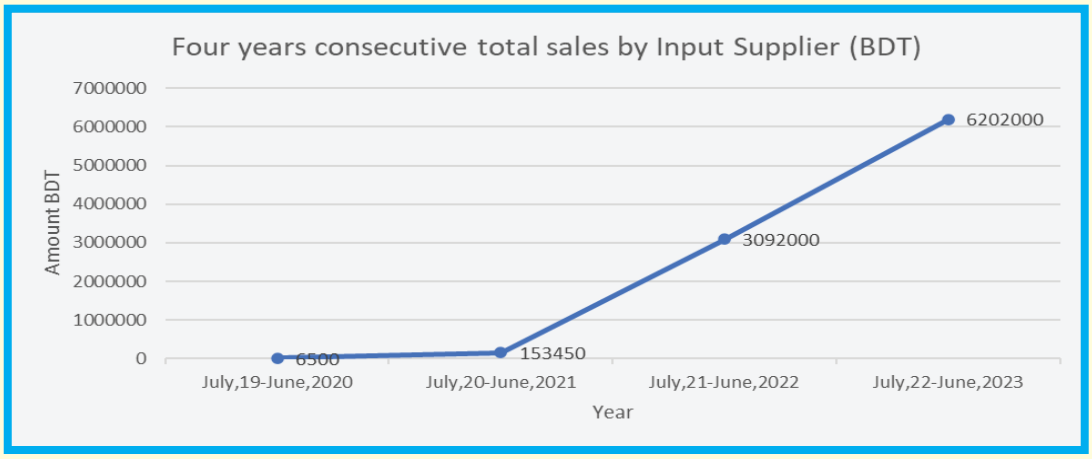


Chart 13: Increment of environment friendly input sales by input suppliers

Explanation: Aforesaid data (graph) shows that in 2023, the project facilitated input suppliers selling about BDT 62,02,000, but in 2020, it was BDT 6500, and consecutively in 2021 and 2022, about BDT 153450 and BDT 30,92,000. Hence, it has been representing the project output in a very promising manner.

Result: Continuous advices from the SEP project and some government regulations and restrictions now a days the aspirated input supplier are willing to sell safe agrochemicals and which are in emerging rate.

1.3.iv: Safe Mango Sale Center Establishment,

Widely it is known as the sale centers is the bottom level threshold of supply chain segment which perform the flow of products to the customers/consumers The main objective of this intervention is to broadcast the safe mango and its availability, affordability, accessibility among the targeted customers directly without touching the intermediaries. As the intermediaries traditionally have taken the maximum benefits and to overcome it sale center tools are being implemented by the project. Under this sub component project is depicting the initial output in order to promote and publicize the safe – health friendly mango in side as well as outside the project area. In this course of action twelve sale centers have been established. Project already distributed common service loan (soft loan) BDT 60,00,000 through the fifteen agreements.

Observation: Micro entrepreneurs authentically accepted the intervention and fell very good result and were interested to do continuously in order to propagate the safe mango every where inside the society.

Result: Due to this apex intervention total amount of BDT Five crores Ninety one lakhs and eighty two thousand(approx.).has been sold against the Nine lakhs twelve thousand and Six hundred fifty kgs of different varieties of mangoes.

1.3.v: Diversified Mango Product Production

Fig Diversified mango products

Different varieties of mangoes have been cultivated commercially in the northwestern region of Bangladesh for a long time. Bangladesh also produced considerable amount of mangoes compared to the other mango produced country in the world and stood in position of Seven. Although mango is a vital seasonal cash crop in our country, but its processing sector not yet flourished as expected. In many countries they have developed the mango based industries and are earning foreign currency and taking part at the national economic development. Mango sector could assist the eliminating of malnutrition, poverty, unemployment, and socio-economic development by fully developing the mango industry as it could be one of the greatest labor markets. Mango based industries could absorb a large number of labor in order to produce varies of product like soft drinks, juices, jams, jellies, etc on the other hand it could be the good source of government revenues.

Under the initiative of the Ghashful SEP project, entrepreneurs are working to commercialize the production of mango products, keeping in mind the current and future business conditions of the mango farmers. Mango scientist uttered that out of the total production 15-20% of the mangoes got damaged by the natural calamities for example insect attacks, natural disasters etc Nevertheless, when the price of mangoes falls, the farmers face many business losses.

By targeting this 15 – 20% damage fruits Ghashful intended to mobilize the entrepreneurs to set up processing unit and to meet up this project disbursed total amount of BDT 50 lakh soft loans among the 20 mango producers for setting up mini mango processing unit. Along with financial support, entrepreneurs have been given hands-on training on the manufacturing of food products (pickles, chutneys, and jams) by skilled trainers from different private and government organization. Project is also assisting the micro entrepreneurs on labeling, branding, certification, packaging, market promotion (including digital marketing) as well as networking among the supportive actors.

All the selected mango product producers are right now following the GMP protocol during producing the quality products, such as; mango pickles and mango bars. They have selected their brand's name, designing brands logo and label for their start up. Some are enlisted below;

1. Green Safe Agro Farm
2. NR Agro Farms
3. Sapahar Fruits Products
4. M/S Sohag Foods Products

Fig Entrepreneur developed logo for enterprises

Result: Total five micro entrepreneurs are jointly cultivating the process commercially for making the mango bar, pickle etc and 103kgs(Mango bar and pickle) products have been sold in exchange of BDT 52340 due to the project intervention. One entrepreneur received BSTI certificate and Four entrepreneurs already got their sanitary certificates for their enterprises and are ebullient to acquire a BSTI certificate. Total number of brand 4, have been developed as is.

Component 2: Strength Access to Finance for Environment friendly and resilient microenterprises:

Sub-Component 2.2: Strengthening of Environmental resilient microenterprises (low polluting):
As per project target 15 crores of money has been distributed among the 800 SEP members but on the other hand total amount of BDT 39,73,60,000 has been distributed rolling basis in respect of the number of agreement (the total 2222).

Table14: List of Financial Services provided under Aggrosor Loan

Sl/ No.	Areas of Loan Disbursement	No of ME (Beneficiaries)	No of Loan Disbursed	Facilities at field level (ME)
01	Environment-friendly Mango Production	780	1924	Farmers' financial crisis have been solved due to seasonal loans. Loans available with easy terms and conditions.
02	Mango Business (shipment)Services	20	20	Multifaceted/Dual business expansion has created interest among entrepreneurs, and demonstrated two way profit/economic development. Linkage facilities among the exporters or premium market
	Total	800	1944	

Lesson Learnt

- Familiar with the key environmental practices and how these practices are improving the environmental ecosystem gradually,
- Acquainted with the negative consequences of imbalance uses of chemical fertilizer and chemical insecticides,
- Technology transfer for Safe mango production like fruit bag, Pheromone trap, Yellow/blue trap,
- Production of vermi compost, trico compost and its uses,
- Access to premium market and establishment of e commerce site,
- Familiar with the business protocol as well as the governmental legislation how to get environmental, product and business certification process,
- Aware with the export market and its behavior how to do,
- Product promotion, Business promotion and marketing is the key for the sustainable business,

- How to improve the shelf life of Mango utilizing the harvesting, treatment, packaging procedure,
- Mango Cold storage, treatment plant, Pack house establishment is the vital issues for the sustainable and profitable business,
- Necessity of Website boosting, Exhibition in order to market and business development, promotion,
- Sufficient and on time support with enough finance to the promising component,
- Enough concentration required on commercialization on product with international standard as a business entity focused on diversification of Mango based product,
- To promote GGAP, GHP, GMP strongly.
- Intensive governmental involvement (all the related agencies) require for accelerating the entire process very firstly and smoothly.

Recommendation for the Micro Entrepreneurs

- All the actors under mango based industries required to bring on same platform to make collective strength owing to leverage the national level policy maker for the goodwill of the mango based industries,
- Ensuring safe mango production by adopting environmental best practices adhere to the principles of an eco-friendly production system(GGAP).
- Facilitating access and make availability of the environment friendly and climate resilience agro input for example organic fertilizers, organic -pesticides, hormones, sex pheromone traps, Yellow trap, fruit bags, early and late variety of planting materials by engaging ambitious input suppliers,
- Make sure for the relentless seasonal financial support with low interest rate to achieved the normal growth of the mango based industries (production, processing, marketing etc),
- All out message broad casting required to activate among the different marketing channel (e marketing, f-marketing) in order to popularize the safe and environment friendly mango production system,
- Product promotion, branding, labelling, certification, packaging, advertising etc should be the main weapon for improving the sale status nationally and internationally needed to ensure at the entrepreneurs level,
- Sufficient publicity for example exhibition, seminar, symposium, postering, video audio display, needed to be engaged from the grass root level to the national level,
- Priority required on to established sufficient storage and processing facilities through the governmental support,
- Micro entrepreneur's capacity building intervention should always be the prime concern in all development level.

Performance of adopted environmental practices

Table 15: Adopted environmental practices due to project intervention:

Sl/ No.	Description (Environment Practices)	No of ME Adopted	Conducted practices	Demonstrated Benefits of environmental practices at the project ground
01	P1. Provision of personal protective equipment (PPE) at the workplace	33	Continue	It Prevents workers from the direct contract of harmful bacteria, germs, chemical pesticides, finally improving the worker health and ensures safer work environment.
02	P2. Arrangement of first aid box for primary health care.	448	Continue	Reducing workplace uncertainty promoting quick recovery, improving workplace morale, and building stronger relationships with labor and entrepreneurs.
03	P4. Provide clean water for workers for drink and to wash their faces, hands, feet.	66	Continue	Promoting good health and improving the productivity of labor as well as encouraging environmental sustainability
04	P8. Provision of a separate place for workers to rest and eat.	160	Continue	The use of resting places improves labor productivity and additionally helps to relieve some stress, which helps promote mental health and well-being. This is also act as one of the important factors for job satisfaction.
05	P10. Cleaning the drains around the workplace and improving the drains.	620	Continue	A proper drainage system maintains the available moisture content while letting excess water out of over moistened soil, increasing the orchard environmental situation. In general, land value and productivity increases.
06	P12. Products will be produced by natural/organic means.	70	Continue in season	Minimizing the use of chemical inputs, resulting in increased production of safe and healthy mangoes.
07	P15. Provision of waste bins for disposal of waste generated by the enterprise.	33	Continue	The environment of the garden is improving due to the reduction in littering. And there has been an increased tendency among entrepreneurs to make farm compost from biodegradable waste.
08	P17. Hanging awareness notices on health protection and	168	Continue	By hanging awareness notices in the garden/enterprises, increasing the public awareness about health, safety, and security among the

CASE STUDY

Md. Shariful Islam Tarafdar is the pioneer in environment friendly or safe mango cultivation sector

Entrepreneur: Md. Soriful Islam Torofder
Father Name: Late. Taijul Islam Torofder
Address: Bhimpur, Rosulpur, Niamotpur, Naogaon
Member Code: 124
Branch: Niamotpur
Organization: Ghashful

Background:

Md. Shariful Islam Tarafdar is a resident of Bhimpur village, Niamatpur upazila. In 2021, he joined the Ghashful organization and invested in mango orchards by taking a loan of Tk. 3 lakh in the 1st phase on February 2, 2021, and a total of Tk. 15 lakh in 4 phases on environment-friendly mango cultivation from the Ghashful SEP project. Also, he is determined to adopt modern environment friendly agri- technology to improve the orchard environmental management in order to increase his income by gathering knowledge obtaining from the training, workshops, exposure etc.

Involvement in SEP Project:

Md. Shariful Islam Tarafdar is a mango producer. In 2016, he started his mango orchard by cultivating mangoes on only three bighas of land. Through this mango cultivation, he ended his unemployed life and starting to develop his economic situation. Now, he has 50 bighas of mango orchards, and his project runs in different areas of Niamotpur Upazilas. But in all his orchards, mangoes were cultivated following the so-called/traditional method and the management of mango orchards was underdeveloped before the SEP project's intervention.

After his involvement with the Ghashful SEP project, he promised to implement environmental development activities in his mango orchard. He promised to manage the mango orchard in an environmentally friendly manner. He participated in the training session and developed his modern mango orchard management skills. At the same time, he followed all the social and environmental norms related to the SEP project for the overall development of his mango orchard and was committed to its implementation. He regularly participates in the environmental club meeting under the SEP project.

Regarding the implementation of environmental practices as promised, he said, "I used to follow the so-called method of gardening." Currently, I am tending the mango garden according to good agricultural practices (GAP). For example, fencing orchards, providing first aid boxes, using pheromone traps, fruit bags, etc. I participated in different types of training, workshops, seminars, environment club meetings, and knowledge exchange tours organized by the SEP project and learned about scientific methods of pesticide management, different types of climate-tolerant mango varieties, the mango storage management process, and the mango export market.

Implementing environmental practices has improved the environment of his mango orchard a lot. Workers also work with satisfaction resulting the improvement of worker productivity. He positively explains that his family and he also was satisfied with the implementation of such environmental practices and committed to continue.

Commitment to the implementation of environmental development practices:

At the time of the SEP loan, Md. Shariful Islam Tarafdar made several promises to improve the environment of his mango orchard. The commitments are as follows:

1. Development of drainage system around the orchard.
2. Hanging awareness notices at appropriate places.
3. Provide a separate place for workers/employees to rest and take food in the mango orchard.
4. Arrangement of first aid box for first aid treatment.
6. Specified waste disposal site (Dustbin).

Images: Implemented environmental practices

Implemented Environmental Development Practices:

Md. Shariful Islam Tarafdar has implemented all the promises he made to improve the environment of his mango orchard while taking a SEP loan. At the same time, he is committed to growing the garden, keeping in mind other environmental issues. The commitments implemented are as follows:

1. Development of drainage system around the orchard.
2. Hanging awareness notices at appropriate places.
3. Provide a separate place for workers/employees to rest and take food in the mango orchard.
4. Arrangement of first aid box for first aid treatment.
5. Organic production of products.
6. Specified waste disposal site (Dustbin).

Status of Result Frame Work

Table 16: Status of Result Frame Work

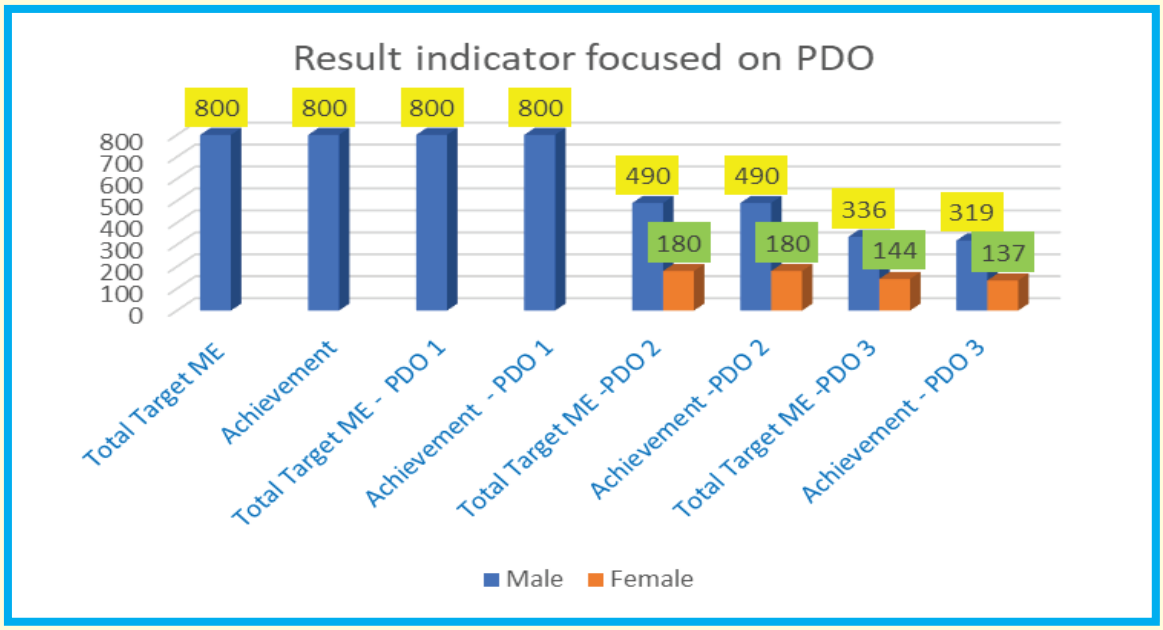


Chart 14: Project performance demonstrated by the Project Development Objectives (PDO)

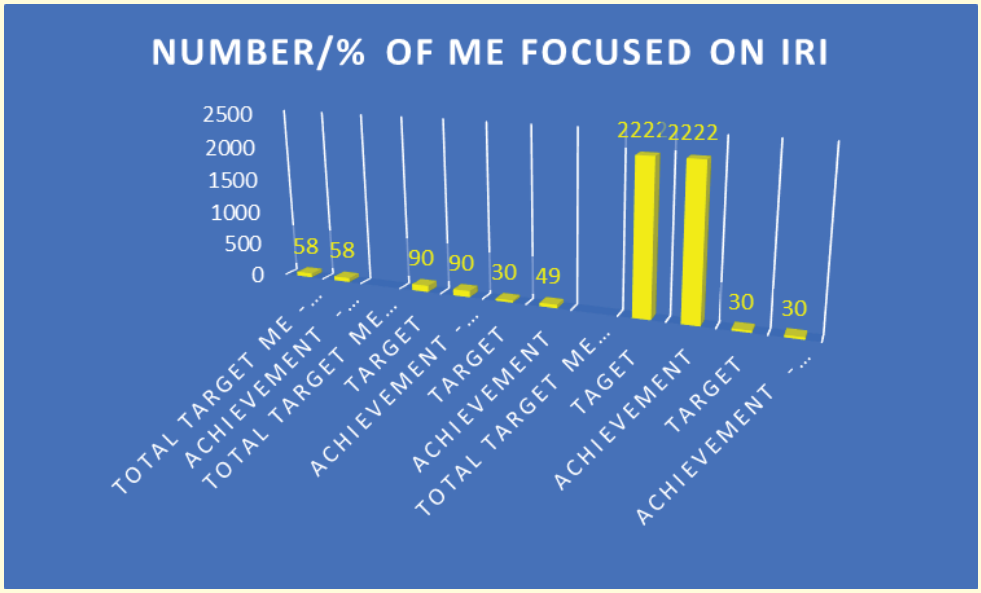


Chart 15: Project performance demonstrated by the Intermediate Result Indicators (IRI)

Sustainability of the Sub - Project Concept

As the Sub project of SEP titled "Eco friendly mango production and trade for sustainable development of the enterprises" under subsector Horticulture (Mango) has been implemented by the prominent and National level NGO Ghashful. Through the entire project life span different types of intervention have been carried out based on sophisticated and modern thematical concept. The deem sustainability of the project concept authentically relies on the underlying key sub activities like: (if taken into account in professional manner):

- ☞ Project expansion and replication would be one of the wings of sustainability.
- ☞ Required continuation of the project intervention with the sufficient financial and technical support,
- ☞ Project personnel would be technically sound, sincere and up to date as per need,
- ☞ Project product all(backward and forward) marketing and supply chain should be highly modernized through the deeper engagement of the Micro entrepreneurs.
- ☞ Producers' group/association needed to strengthen focused on business sustainability,
- ☞ Its needed to make sure the availability of Supportive service provider ,
- ☞ Product diversification should be the vital wing for the profitable move on,
- ☞ Enough Promotional materials, campaign is the another vital task for the sustainability,
- ☞ Public-Privat-Partnership (PPP) should be established,

Conclusion

Environmental and business sustainability of the Horticulture(mango) is counted on sustainable and eco-friendly mango production (Safe mango), mango product diversification, storage, transportation and marketing strategies along with making availability of environment friendly technology and environment friendly agro inputs.

Ghashful is implementing this SEP sub-project aims to materialize this mission in the field through collaboration and participation of different horticultural value chain actors/stakeholders and is focusing on micro entrepreneurs. There are 828 MEs already adopted total 08 of different types of prescribe environment practices. Due to the project intervention, right now the project key indicators for example uses of environment friendly agro input like fruit bag, trap, compost fertilizer increasing, availability of safe mango also increasing, producers are initiating to sale mango at the premium as well as the export market with a handsome price. Capacity of the Micro entrepreneurs is also improving such as bargaining power, linkage development, familiar with the research station, product branding, certification, export market, production of agro input also are becoming easier due to the project intervention. As per observation (primary data) seems that environmental pollution also is declining due to the affiliation of the environmental practices and its continuation.

Through financial and technical support along with necessary trainings on GGAP, GHP, GMP and market linkage workshops; this sub-project presently demonstrated highly effective focused on improving the environment issues as well as safe mango production. In addition this project also is making substantial contribution in national and local economy due to the collective efforts of the micro entrepreneurs.

Owing to the PKSF all out support , GHASHFUL is able to complete the project with great success and necessarily this booklet will act as a mirror of the project intervention where each and every key issues are illustrated in a crystal clear way so that every knowledge seeker could consume and digest it very easily as per needs.

PHOTO GALLARY

Image: Project Launch workshop facilitated by the Ghashful SEP at the NiamotpurUpazila complex premises in presence of UpazilaNirbahi officer, Upazila Chairman, Upazila Agriculture Officer, Ghashful officials including other local elite along with project beneficiaries.

Image: Programme Officer, Mr. Julfiqar Rahman, PKSF, addressing about the new and high yielding varieties of mangoin front of ME through the digital device during the time of project visit. .

Image: Ghashful CEO, Mr. Aftabur Rahman Jafree and other private officials visiting the model mango orchard established by the SEP project at the Sapahar project site and discussing about the environmental improvement, safe mango production.

Image: Additional Director, Rajshahi and Deputy Director, Naogon of Agriculture Extension department attending at the Ghashful SEP project beneficiaries' capacity building training session at the Niamotpur project site focused on GGAP

Image: Upazila Agriculture officer and Extension Officer, Sapahar, Naogon addressing at the Ghasful SEP borrower training session focused on safe mango production and Environmental improvement.

Image: Honorable Food Minister Mr. Sadhon Chandra Mujumder , M. P. and other governmental official visited the Ghashful SEP stall at the "Agriculture Technology Fair – 2023" organized by the Department of Agriculture Extension, Sapahar, Naogaon. He adviced the project team to do more work on mango processing sector.

Image: "Victory Day – 2022" Celebration
Ghashful SEP project celebrated the "Victory Day -2022". On that day various events have been carried out like rally, discussion etc at the Sapahar project site, Naogoan. Upazila vice chairman, Sapahar, Ghashful officials and micro entrepreneurs were at the scene.

Image: Ghashful SEP project celebrated the "World Environment Day -2022" sponsored by the environment club on that day various events have been carried out like rally, discussion and tree plantation progrmme at the Sapahar project site , Naogoan. Upazila sanitary inspector, Ghashful officials and project beneficiaries were Practicing there.

Image: 'Observing Field Day'
On that day Ghashful SEP Project Manager, Qudrat-E-Khoda Md. Naser advised the lead ME for practing and continuing the ESP in order to produced the safe mango respecting the GGAP.

Image:A five day long “Mango and Mango based product Fair-2023” facilitated jointly by the GhashfulSEP and District administration Naogaon at the heart of Nagogaon held district town. Honorable Deputy Commissioner , Mr. Khalid Mehedi Hasan , BPAA , other govt and Ghashful high officials inauguratied the fair on June 19, 2023. Chief guest also visited the individual micro entrepreneurs stall accordingly.

Image: In order to improve the capacity of the micro entrepreneurs SEP project conducted there six exchange visits at the country side. Both male and female entrepreneurs spontaneously participated at the event and gained multidimensional knowledge through the interaction with the different variety of expert. Aforesaid image indicates that ME, visited the International Trade Fair and Central Pack- house, Dhaka.

Image: Ghashful SEP project organized and facilitated a two day “Safe and Health Friendly Mango Fair_2022 at the heart of Naogaon District town. Honorable Additional Deputy Commissioner Mr. ShihabRayhan inaugurated the two days event dated on June 29, 2022. Twenty MEs participated there along with their safe product.

Image: During a knowledge exchange visit to Satkhira and Khulna, the Ghashful SEP team is actively gathering information on environmentally friendly mango production from local entrepreneurs.As well as entrepreneurs are exchanging insights on the challenges they have faced in exporting mangoes, as well as how they have successfully overcome those challenges.

Image: Environmental Certification and Exporter engagement workshop carried out by the Ghashful SEP held at the Sapahar project site in order to facilitate access to premium market for example export market abided by the GGAP. Member of export association, DD, Central Pack house, Dhaka, DD, Naogaon, UNO, Sapahar was also present during the occasion and had been provided high profile messages to the mango micro entrepreneurs.

Image: Coordination meeting among the ME and Service provider is one of the inevitable parts of the SEP project and has been implemented in a very fruitful way. Environment friendly agriinput producers "Organic Farm Bd" and SEP micro entrepreneurs attended at the participatory learning session at the Sapahar project site, Naogaon.

Image: ProgrmmeOffier, PKSF, Md. Anowar Hossain advised the mango micro entrepreneurs regarding the improvement of orchard environmental status and to produce the safe mango during his project visit at Sapahr, Naogoan.

Image: Ghashful SEP conducted "Product Certification Workshop" at the Sapahar project site for the micro entrepreneurs in order to increase the capacity of the beneficiaries and an expert Mr. Debbroto Biswas , Deputy Director of BSTI was being addressed during the event.

Image: Aforesaid image depicting the lesson learnt workshop. Through this seminar project highlighted how the environment friendly agri input and best ESP improved the micro entrepreneurs surrounding environment and its way out plus the way of producing the safe mango. Additional Director and Deputy Director of DAED, Ghashful high officials and lead ME were at the event.

MEDIA COVERAGE

জাতীয়

নিয়ামতপুরে নিরাপদ আম উৎপাদন, প্যাকেজিং ও বিপণন বিষয়ক কর্মশালা

মার্চ ৩, ২০২১ / প্রকাশক

নওগাঁর নিয়ামতপুরে ঘাসফুলের আয়োজনে নিরাপদ আম উৎপাদন, প্যাকেজিং ও বিপণন বিষয়ক কর্মশালা অনুষ্ঠিত হয়। ছবি- নিয়ামতপুর প্রতিনিধি

নিয়ামতপুর (নওগাঁ): নওগাঁর নিয়ামতপুরে বেসরকারী সংস্থা ঘাসফুল এর উদ্যোগে নিরাপদ আম উৎপাদন, প্যাকেজিং ওবিপণন জ্ঞান বিনিময় বিষয়ক কর্মশালা অনুষ্ঠিত হয়।

বুধবার ৩১ মার্চ বেলা১১টায় উপজেলা পরিষদ মিলনায়তনে এ কর্মশালার আয়োজন করা হয়।সহকারী কমিশনার (ভূমি) নিলুফা সরকারের সভাপতিত্বে কর্মশালায় প্রধানঅতিথি হিসাবে বক্তব্য রাখেন উপজেলা পরিষদ চেয়ারম্যান ফরিদ আহামেদ।কর্মশালা উদ্বোধন করেন ঘাসফুলের নির্বাহী কর্মকর্তা আফতাবুর রহমানভাকরী।

সহকারী পরিচালক সামসুল হকের পরিচালনায় ও পল্লী কর্ম-সহায়ক ফাউন্ডেশন(পিকেএসএফ) এর সহযোগিতায় বিশেষ অতিথি হিসাবে উপস্থিত ছিলেনপিকেএসএফ কনসালটেন্ট (প্যাপ) ড. আরিফ মাহমুদ, চাঁপাইনবাবগঞ্জের্জার্মপ্লাজম অফিসার কৃষিবিদ ড. জহুরুল ইসলাম, উপজেলা কৃষিসম্প্রসারণ অফিসার রফিকুল ইসলাম।

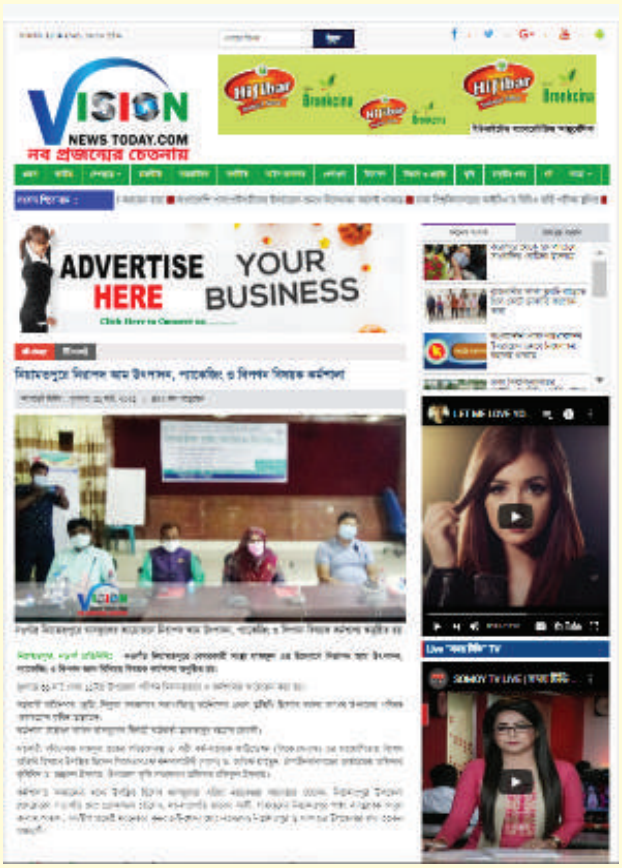
কর্মশালায় অন্যান্যের মধ্যে উপস্থিত ছিলেন ঘাসফুলের এরিয়া ম্যানেজারআনোয়ার হোসেন, নিয়ামতপুর উপজেলা প্রেসক্লাবের সভাপতি মোঃতোফাজ্জল হোসেন, সহ-সভাপতি জাবেদ আলী, ঘাসফুলের নিয়ামতপুর শাখাব্যবস্থাপক আবুল কালাম আজাদ, এসইপি প্রোজেক্ট ম্যানেজার কুসরত-ই-খোদামোঃ নাসেরসহ নিয়ামতপুর ও সাপাহার উপজেলার প্রায় ২০জন আমচাষী।

ডেল্টা টাইমস্

নিয়ামতপুরে নিরাপদ আম উৎপাদন, প্যাকেজিং ও বিপণন বিষয়ক কর্মশালা

সর্বশেষ সংবাদ

সর্বাধিক পঠিত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ধূমকেতুনিউজ
নিয়ামতপুরে নিরাপদ আম উৎপাদন, প্যাকেজিং ও বিপণন বিষয়ক কর্মশালা


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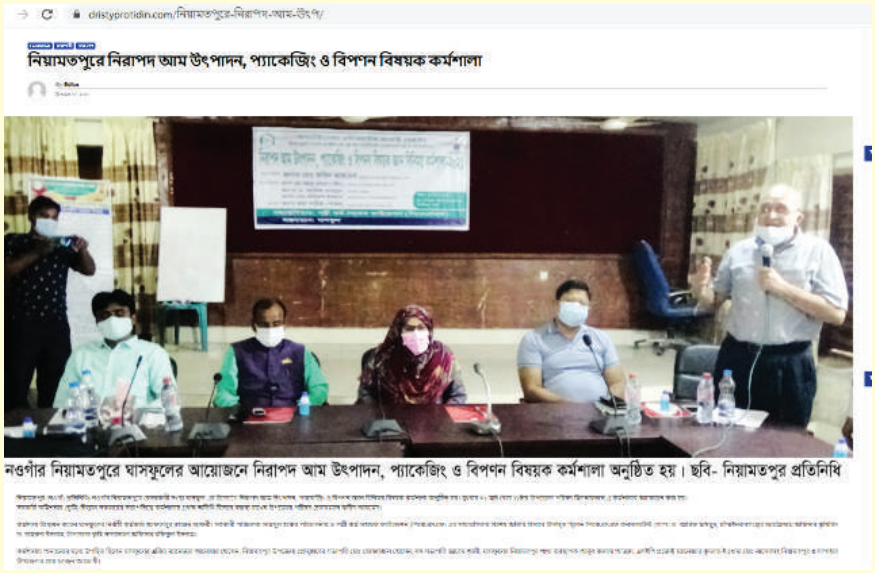

নিয়ামতপুরে নিরাপদ আম উৎপাদন, প্যাকেজিং ও বিপণন বিষয়ক কর্মশালা

নওগাঁর নিয়ামতপুরে ঘাসফুলের আয়োজনে নিরাপদ আম উৎপাদন, প্যাকেজিং ও বিপণন বিষয়ক কর্মশালা অনুষ্ঠিত হয়। ছবি- নিয়ামতপুর প্রতিনিধি

পুন্ড্র কথা

নিয়ামতপুরে নিরাপদ আম উৎপাদন, প্যাকেজিং ও বিপণন বিষয়ক কর্মশালা

সময় সংযোগ

নওগাঁ নিয়ামতপুরে নিরাপদ আম উৎপাদন, প্যাকেজিং ও বিপণন বিষয়ক কর্মশালা

পদ্মা প্রতিদিন

সাপাহারে এসইপি প্রজেক্টের অগ্রগতি স্টেইকহোল্ডারদের অবহিতকরণ কর্মশালা অনুষ্ঠিত

প্রথম আলো

প্রদর্শনীতে বউ ভোলানো, শ্রাবণী, তরফদারভোগসহ ৫০ জাতের আম

দৈনিক আজকের বসুন্ধরা
The Daily Ajker Basundhara

নওগাঁয় দুই দিন ব্যাপী আম মেলার উদ্বোধন

মো.আককাস আলী

উত্তম কৃষি অনুশীলন এর মাধ্যমে উৎপাদিত নিরাপদ ও স্বাস্থ্য বান্ধব আম চাষে উৎসাহিত করার লক্ষ্যে নওগাঁয় দুদিনব্যাপী আম মেলা শুরু হয়েছে। পল্লী কর্ম-সহায়ক ফাউন্ডেশন (পিকেএসএফ) এর সহযোগিতায় বে-সরকারি উন্নয়ন সংগঠন ঘাসফুল দুই দিন ব্যাপী এই আম মেলার আয়োজন করেন। বুধবার ২৯ জুন বিকাল সাড়ে ৪ টায় নওগাঁ নওজোয়ান মাঠে আম মেলার আনুষ্ঠানিকভাবে উদ্বোধন করেন নওগাঁর অতিরিক্ত জেলা প্রশাসক ''শিক্ষা ও আইসিটি'' শিহাব রায়হান। কৃষি সম্প্রসারণ অধিদপ্তর নওগাঁর ভারপ্রাপ্ত উপ-পরিচালক এ কে এম মনজুরে মওলার সভাপতিত্বে আয়োজিত উদ্বোধনী মেলায় অন্যান্যের মধ্যে বক্তব্য রাখেন, নওগাঁ সদর উপজেলা পরিষদের চেয়ারম্যান আলহাজ্ব রফিকুল ইসলাম রফিক, ঘাসফুলের সহকারী পরিচালক রাব্বানী বসুনিয়া ও সাইদুর রহমান এবং প্রজেক্ট ম্যানেজার নাসের। মেলায় প্রায় ২০টি স্টলে ন্যাংড়া, হাড়িভাঙ্গা, আম্রপালী, আশ্বিনা, বারী-৪, বারোমাসী কাটিমন, বারী-৮, বারী-৭, সুরমা ফজলী, ফজলী, ▶▶ এরপর পৃষ্ঠা ৭

প্রথম আলো

কেঁচো সারে কৃষকের ভরসা

কৃষি উদ্যোক্তা

রাসায়নিক সার ব্যবহারে মাটির উর্বরতা শক্তি নষ্ট হয়। তাই কেঁচো সার উৎপাদনে যুক্ত হয়েছেন নিয়ামতপুরের ইকবাল হোসেন।

ওমর ফারুক, *নওগাঁ*

বসতবাড়ি ঘেঁষে ২৫ শতক জমিতে গড়ে তোলা হয়েছে লম্বা ঘর। কংক্রিটের খুঁটির ওপর বাঁশের কাঠামো। ওপরে টিনের ছাউনি। ছাউনির নিচে কংক্রিটের গোলাকার ও আয়তাকার কয়েকটি রিং স্ল্যাবে কেঁচো সার প্রস্তুত করা হচ্ছে। ঘরের দক্ষিণ পাশের একটি অংশে মেঝেতে স্তূপ করে রাখা হয়েছে শুকনো গোবর। স্তূপ থেকে শুকনো গোবর নিয়ে সেগুলো ঝাঁকনিতে ছেঁকে শুকনা গোবর ঝুরঝুরে করার করছেন এক ব্যক্তি।

যিনি কেঁচো সার প্রস্তুত করছিলেন, সেই ব্যক্তির নাম ইকবাল হোসেন (৪৮)। নওগাঁর নিয়ামতপুর উপজেলার সদর ইউনিয়নের কলেজপাড়া এলাকায় কেঁচো সার তৈরির এই খামার গড়ে তুলেছেন ইকবাল হোসেন। উৎপাদন শুরুর মাত্র এক বছরে ইকবালের কেঁচো সারের ওপর আস্থা রাখছেন এলাকার অনেক কৃষক। রাসায়নিক সারের অধিক ব্যবহারে জমির উর্বরতা শক্তি নষ্ট হয়। এ কারণে কৃষিবিদেরা বর্তমানে রাসায়নিক সার ব্যবহারকে নিরুৎসাহিত করছেন। এই সময়ে কেঁচো সার সরবরাহ করে এলাকার কৃষকের ভরসার প্রতীকে হয়ে উঠেছেন তিনি।

সম্প্রতি ইকবালের খামারে গিয়ে দেখা গেল, নিয়ামতপুর উপজেলা সদরের কলেজপাড়া এলাকায় ৪০ ফুট দীর্ঘ ও ১৫ ফুট প্রস্থের টিনশেডের একটি ঘর। ছাউনির নিচে ঘরটির একপাশে কংক্রিটের পাঁচটি আয়তাকার ও দুটি গোলাকার রিং স্ল্যাব কমপোস্ট প্ল্যান্ট হাউস। ঘরটির পশ্চিম দিকের এক পাশের একটি অংশে পোলট্রি খামার।

যেভাবে শুরু কেঁচো সার উৎপাদন

২০২১ সালে এক প্রতিবেশীর পরামর্শে ঘাসফুল নামের একটি বেসরকারি সংস্থার (এনজিও) এসইপি প্রকল্প থেকে কেঁচো সার (ভার্মি কমপোস্ট) উৎপাদন বিষয়ে তিন দিনের প্রশিক্ষণ নিয়ে কেঁচো সার উৎপাদন শুরু করেন তিনি।

কেঁচো সার উৎপাদনের চিন্তা এল কোথা থেকে, জানতে চাইলে তিনি বলেন, বর্তমানে তাঁর নিজের তিনটি, মায়ের চারটি ও তাঁর ভাইয়ের দুটি করে গরু আছে। সারা বছরই তাঁদের বাড়িতে কমবেশি ১০-১২টা করে গরু থাকে। বর্তমানে তাঁদের বাড়িতে যে ১১টি আছে। তার মধ্যে বিদেশি নয়টি গরু আছে। এসব গরু থেকে পাওয়া দুধ বিক্রি করে কিছু উপার্জন হতো। কিন্তু গরুর গোবরগুলো বসতবাড়ির পাশে স্তূপ করে রাখা

নওগাঁর নিয়ামতপুর উপজেলার কলেজপাড়া এলাকার বাড়িতে কেঁচো সার উৎপাদনের কাজ করছেন ইকবাল হোসেন। প্রথম আলো

হতো। এসব গোবরের কিছু আবাদি জমিতে জৈব সার হিসেবে ব্যবহার করা হতো। আর বেশির ভাগই অব্যবহৃত হয়ে আবর্জনা হিসেবে পড়ে থাকত। কোনো কাজে লাগত না। কেঁচো সার উৎপাদন শুরু করার পর থেকে আবর্জনা হিসেবে পড়ে থাকা গোবরগুলোই এখন উপার্জনের উৎসে পরিণত হয়েছে। সংসারে ফিরেছে সচ্ছলতা।

২০২১ সালের আগস্ট মাসে ঘাসফুল এনজিও থেকে ৫০ হাজার টাকা ঋণ নিয়ে আড়াই কেজি কেঁচো ও তিনটি রিং স্ল্যাব নিয়ে সার উৎপাদন শুরু করেন ইকবাল। পরে আরও চারটি ১৫ ঘনফুটের চারটি কংক্রিটের আয়তাকার হাউস ও ৯ ঘনফুটের দুটি রিং স্লাবে কেঁচো সার উৎপাদন শুরু করেন। প্রথমে ঘাসফুল এনজিও থেকে আড়াই কেজি কেঁচো তাঁকে দেওয়া হয়। শুরুর দিকে প্রতিটি রিং স্ল্যাব তৈরি করতে খরচ হয় ৫০০ টাকা করে। প্রথম উৎপাদন চক্রে কেঁচো সার পান ৫০ কেজি। কেঁচোর সংখ্যাও বৃদ্ধি পায়। তিন-চার মাস পর ঋণের টাকা নিয়ে আরও সাতটি কমপোস্ট প্ল্যান্ট হাউস ও টিনশেডের ঘর নির্মাণ করেন। বর্তমানে তাঁর সাতটি কমপোস্ট প্ল্যান্ট হাউস থেকে এক চক্রে (৪০ দিন) ৫৬ মণ কেঁচো সার উৎপাদিত হয়। প্রতি কেঁচো সার বিক্রি হচ্ছে ৮০০ টাকা মণ। এই হিসাবে এক চক্রে ইকবাল কেঁচো সার বিক্রি করেন ৪৪ হাজার ৮০০ টাকার।

নিয়ামতপুর উপজেলা কৃষি কর্মকর্তা কামরুল হাসান বলেন, 'রাসায়নিক সার ব্যবহারের কারণে আমাদের পরিবেশের ক্ষতি হচ্ছে। সেই সঙ্গে নিরাপদ খাদ্য উৎপাদন ব্যাহত হচ্ছে। এ কারণে কৃষি বিভাগ সব সময় জৈব সার ব্যবহারে কৃষকদের উৎসাহিত করে আসছে।'

কামরুল হাসান আরও বলেন, 'কেঁচো সারে একসঙ্গে ছয়-সাতটি পুষ্টি উপাদান পাওয়া যায়। রাসায়নিক সার ব্যবহারে করে সেসব পুষ্টি পেতে হলে ছয়-সাত ধরনের রাসায়নিক সার ব্যবহার করতে হবে। কেঁচো সার ব্যবহারে মাটির উর্বরতা শক্তি বৃদ্ধি পায় ও মাটির পানি ধারণক্ষমতা বাড়ে।

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সাপাহারে পাবলিক টয়লেট এর উদ্বোধন

সাপাহার (নওগাঁ) প্রতিনিধিঃ নওগাঁর সাপাহারে সাসটেইনেবল এন্টারপ্রাইজ প্রজেক্ট "ইকো ফ্রেন্ডলি ম্যাংগো প্রডাক্টশন এন্ড ট্রেড ফর সাসটেইনেবল ডেভেলপমেন্ট অব দি এন্টারপ্রাইজেস" এসইপি প্রকল্পের অর্থায়নে নির্মিত আমের বাজারের স্যানিটেশন ব্যবস্থার উন্নয়নের জন্য পাবলিক টয়লেট এর উদ্বোধন করা হয়েছে। গত মঙ্গলবার দুপুরে পল্লীকর্ম-সহায়ক ফাউন্ডেশন (পিকেএসএফ) এর সহযোগিতায় ও ঘাসফুল এর বাস্তবায়নে প্রকল্পের প্রজেক্ট ম্যানেজার কুদরতে খোদা মোঃ নাছের এর সভাপতিত্বে উপজেলার সদরের নতুন বাসষ্টান্ডে ১টি পাবলিক টয়লেট ও ১টি সাবমার্সেবলপাম্প এবং তিলনা ইউনিয়নের হরিপুর বাজারে ১টি পাবলিক টয়লেট এর উদ্বোধন করেন উপজেলা নির্বাহী অফিসার আব্দুল্যাহ আল মামুন। এসময় উপজেলা ভাইস চেয়ারম্যান আব্দুর রশিদ, প্রকল্পের সাপাহার শাখার এলাকা ব্যবস্থাপক শাহীনুজ্জামান,ডকুমেন্টেশন অফিসার বেলাল আহমেদ সহ আরো অনেকে সেখানে উপস্থিত ছিলেন।

প্রথম আলো

বাহারি সব আম নিয়ে মেলা

প্রতিনিধি, *নওগাঁ*

আমের নতুন রাজধানীখ্যাত নওগাঁয় উৎপাদিত হয় বাহারি সব আম। এর কোনোটির রং আকর্ষণীয়, কোনোটি স্বাদে অতুলনীয়, কোনোটি আবার আকারে বড়। এমন সব বাহারি আম নিয়ে শুরু হয়েছে মেলা।

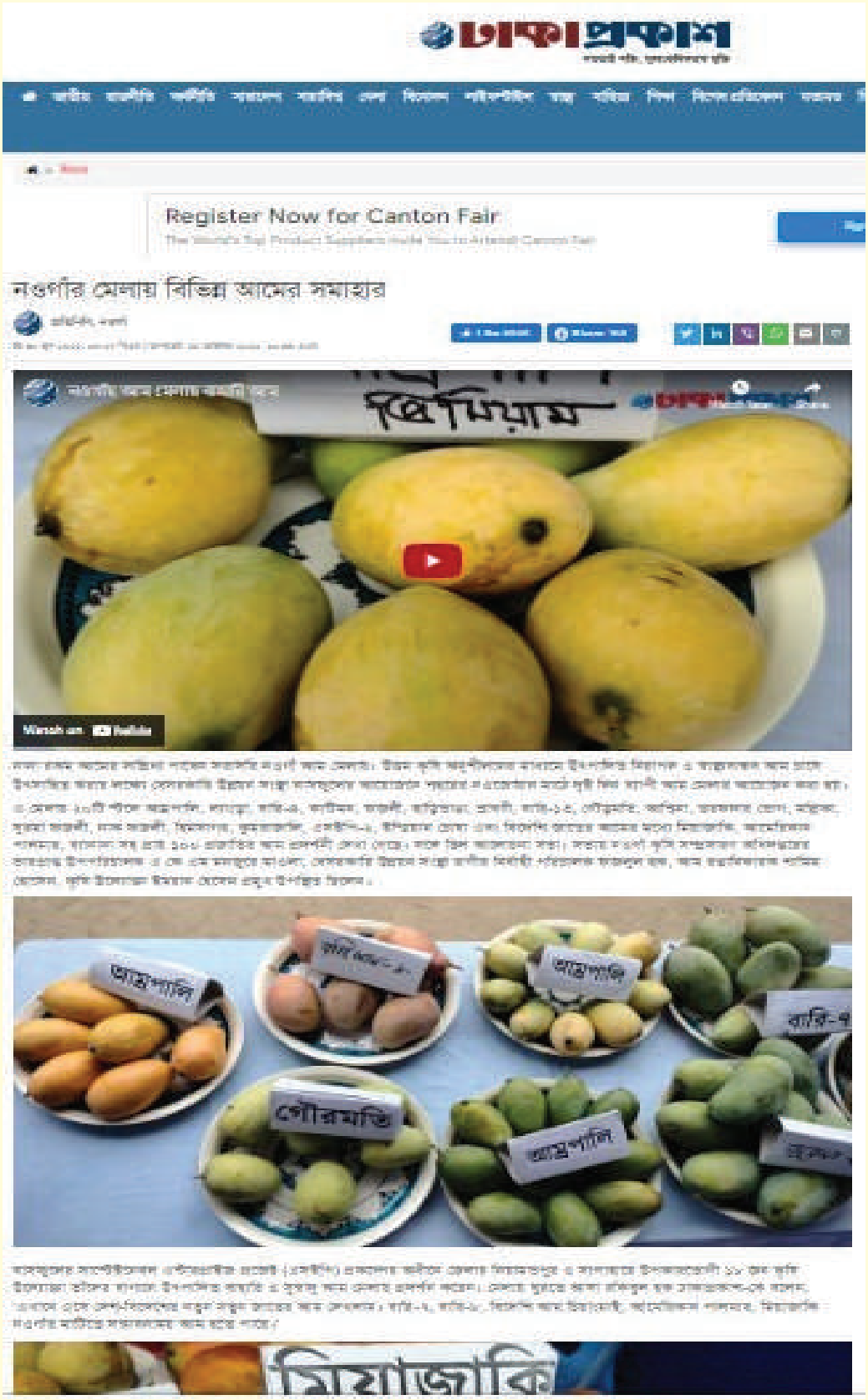
নওগাঁ শহরের নওযোয়ান মাঠে এ মেলার আয়োজন করেছে বেসরকারি উন্নয়ন সংস্থা ঘাসফুল। গতকাল বুধবার বিকেলে দুই দিনব্যাপী এ মেলার উদ্বোধন করেন নওগাঁ কৃষি সম্প্রসারণ অধিদপ্তরের ভারপ্রাপ্ত উপপরিচালক এ কে এম মনজুরে মাওলা।

মেলা ঘুরে দেখা গেছে, দেশি জাতের আম্রপালি, ল্যাংড়া, বারি-৪, কাটিমন, ফজলী, হাঁড়িভাঙা, শ্রাবণী, বারি-১৩, গৌড়মতি, আশ্বিনা, তরফদার ভোগ, মল্লিকা, সুরমা ফজলী, নাগ ফজলী, হিমসাগর, এসইপি-২, ইন্ডিয়ান চোষা ও বিদেশি জাতের মধ্যে মিয়াজাকি, আমেরিকান পালমার, ব্যানানাসহ প্রায় ১০০ প্রজাতির আম প্রদর্শন করা হচ্ছে।

ঘাসফুলের সাসটেইনেবল এন্টারপ্রাইজ প্রজেক্ট (এসইপি) প্রকল্পের অধীন জেলার নিয়ামতপুর ও সাপাহারে উপকারভোগী ১৮ জন কৃষি উদ্যোক্তা তাঁদের বাগানে উৎপাদিত আমমেলায় নিয়ে এসেছেন।

নওগাঁয় আমের মেলায় বাহারি জাতের আম। ছবি : প্রথম আলো

এসইপি প্রকল্পের পরিবেশ কর্মকর্তা মুসাব্বির আহমেদ বলেন, পিকেএসএফের সহযোগিতায় নিয়ামতপুর ও সাপাহারে আট শতাধিক কৃষককে নিরাপদ আম উৎপাদনে প্রশিক্ষণ দিয়ে থাকে। এছাড়া এসব কৃষকের উৎপাদিত আম দেশে ও বিদেশে বাজারজাতকরণে সহযোগিতা করে আসছে।



ঢাকাপ্রকাশ

Register Now for Canton Fair

নওগাঁর মেলায় বিভিন্ন আমের সমাহার

রফতানিযোগ্য আম প্রধানমন্ত্রীর কার্যালয়ে প্রেরণ করে নওগাঁর আমচাষীদের ভাগ্যবদল

নিজস্ব সংবাদদাতা, নওগাঁ ॥ বেসরকারী সংগঠন এসইপি প্রকল্পের সহায়তায় নওগাঁর সাপাহার উপজেলার অনেক আমচাষী আমচাষ করে স্বাবলম্বী হয়েছেন। সংগঠনটি শুধু কৃষককে আর্থিক সহযোগীতাই নয় সরাসরি তারা এ প্রকল্পের মাধ্যমে মাঠের মধ্যে প্রাকৃতিক পরিবেশের ভারসাম্য রক্ষা করে বিষমুক্ত আম উৎপাদনের মাধ্যমে উদ্যোক্তাদের হাতে কলমে প্রশিক্ষন দিয়ে তাদের আমচাষে উদ্বুদ্ধ করেছেন।

শেষে এবছর প্রকল্পটি নওগাঁর সাপাহার ও নিয়ামতপুর ঘাসফুল এসইপি প্রকল্পের নিরাপদ অর্গানিক আম প্রধানমন্ত্রীর কার্যালয়ে প্রেরণ করেছে।

প্রকল্পের কর্মকর্তা কুদরতে খোদা মো: নাসের জানান, সাপাহার উপজেলা কৃষি অফিসের সহায়তায় চলতি মাস হতে বিভিন্ন ধাপে ঘাসফুল এসইপি প্রকল্পের কৃষি উদ্যোক্তা জিয়াউর রহমানের বাগান থেকে নিরাপদ অর্গানিক রফতানিযোগ্য প্রায় দেড় টন আম প্রথম চালান হিসেবে সর্বমোট ৬ টন আম নর্থ বেঙ্গল এগ্রো ফার্মস লিমিটেডের সহায়তায় গণ প্রজাতন্ত্রী বাংলাদেশ সরকারের প্রধানমন্ত্রীর কার্যালয়ে প্রেরণ করেন। ফলে এলাকার আমচাষীগন এই প্রকল্পের প্রতি আরোও মুগ্ধ হয়ে আমচাষে ঝুঁকে পড়েছেন।

সাসটেইনেবল এন্টারপ্রাইজ প্রজেক্ট (এসইপি) প্রকল্প বিশ্বব্যাংক ও পল্লী কর্ম-সহায়ক ফাউন্ডেশন (পিকেএসএফ) যৌথ অর্থায়নে সারাদেশ ব্যাপী পরিচালিত প্রকল্পটি এখন নওগাঁর সাপাহার ও নিয়ামতপুরে আমচাষীদের সহযোগীতা করে চলেছেন এবং ঘাসফুল এই প্রকল্পের উপ-প্রকল্প প্রাকৃতিক পরিবেশের ভারসাম্য রক্ষা করে বিষমুক্ত আম উৎপাদনের মাধ্যমে উদ্যোক্তাদের টেকসই উন্নয়ন পিকেএসএফের সহায়তায় জেলার এ দুই উপজেলা সাপাহার ও নিয়ামতপুরে বাস্তবায়ন করছে।

নওগাঁ সাপাহার থেকে আম্রপালি আমের আরেকটি চালান রপ্তানি হলো ব্রিটেনে

সোহেল রানা: আলহামদুলিল্লাহ আজ ইংল্যান্ডে রপ্তানি হল আমাদের বাগানের আম্রপালি (বারি আম-৩) আমের ২য় চালান।

আমাদের বরেন্দ্র এগ্রো পার্ক এর বাগানে উৎপাদিত আম্রপালি আমের ২য় চালান (প্রায় দেড় টন) আজ ইংল্যান্ডে যাচ্ছে।বারি'র ঊর্ধ্বতন বৈজ্ঞানিক কর্মকর্তা ড. মো: শরফ উদ্দিনের তত্ত্বাবধানে Global GAP অনুসরন করে রপ্তানিযোগ্য এসব আম উৎপাদন করা হয়েছে।

প্রথম আলো

আম রপ্তানিতে বাধা পেরোতে সরকারি উদ্যোগ চান চাষিরা

প্রতিনিধি, *নওগাঁ*

দেশে অন্যতম আম উৎপাদনকারী জেলা নওগাঁয় যে পরিমাণ আম উৎপাদিত হয়, তার তুলনায় রপ্তানির পরিমাণ খুব সামান্য। বিগত কয়েক বছরের অভিজ্ঞতা থেকে আম চাষ ও ব্যবসার সঙ্গে যুক্ত ব্যক্তিরা বলছেন, রপ্তানি না বাড়ালে আমের কাঙ্ক্ষিত দাম পাবেন না চাষিরা। এতে ভালো আম উৎপাদনে আগ্রহ ধরে রাখা কঠিন হবে।

এমন অবস্থায় এই জেলার আমচাষিরা রপ্তানিতে বাধা দূর করার পাশাপাশি সরকারের কাছ থেকে আধুনিক উদ্যোগ আশা করছেন। নওগাঁ থেকে আরও বেশি আম রপ্তানি করার জন্য রপ্তানিকারকদের আহ্বান জানিয়েছেন চাষিরা।

গতকাল সোমবার নওগাঁর সাপাহারে বেসরকারি সংগঠন ঘাসফুলের আয়োজনে 'পরিবেশগত সনদ ও রপ্তানিকারকদের এনগেজমেন্ট' কর্মশালায় আম রপ্তানির ক্ষেত্রে স্থানীয়ভাবে বেশ কিছু বাধার কথা তুলে ধরেন আমচাষিরা। পল্লী কর্ম-সহায়ক ফাউন্ডেশনের আর্থিক সহায়তায় নওগাঁর সাপাহার ও নিয়ামতপুর উপজেলায় সাসটেইনেবল এন্টারপ্রাইজ প্রজেক্ট (এসইপি) বাস্তবায়ন করছে ঘাসফুল।

সাপাহার উপজেলা নির্বাহী কর্মকর্তা (ইউএনও) আবদুল্লাহ আল মামুনের সভাপতিত্বে কর্মশালায় প্রধান অতিথির বক্তব্য দেন কৃষি সম্প্রসারণ অধিদপ্তর নওগাঁর উপপরিচালক আবুল কালাম আজাদ। বিশেষ অতিথির বক্তব্য দেন ঢাকার শ্যামপুরের সেন্ট্রাল প্যাক হাউসের উপপরিচালক এস এম খালিদ সাইফুল্লাহ। কর্মশালায় বাংলাদেশ ফ্রুটস অ্যান্ড ভেজিটেবল এক্সপোর্টার অ্যাসোসিয়েশনের (বিএফভিএপিই) প্রতিনিধি ও রপ্তানিকারক আবুল হোসাইন ও নাজমুল হায়দার ভুঞা চাষিদের উদ্দেশে নির্দেশনামূলক বক্তব্য দেন।

কর্মশালায় উপস্থিত আমচাষিরা আম রপ্তানির ক্ষেত্রে বেশ কিছু বাধার কথা তুলে ধরেন। তাঁরা বলেন, আম রপ্তানির জন্য সবচেয়ে বড় বাধা হচ্ছে, আম দূষণমুক্ত বা নিরাপদ করা ও আমের পচন রোধের জন্য এ অঞ্চলে ভ্যাপার হিট ট্রিটমেন্ট (ভিএইচটি) প্ল্যান্ট নেই। দ্রুততম সময়ের মধ্যে নওগাঁয় একটি ভিএইচটি প্ল্যান্ট স্থাপন করা প্রয়োজন। আবার আম বাছাইয়ের জন্য প্যাকিং হাউস ও সহজে সঙ্গনিরোধ (কোয়ারেন্টিন) সনদ পাওয়ার জন্য নওগাঁ কৃষি বিভাগের সঙ্গ নিরোধ শাখা স্থাপন করা দরকার। এ ছাড়া রপ্তানির জন্য কৃষি বিভাগের কাছ থেকে পরিবেশগত সনদ পাওয়ার জন্য অন্য ঝামেলা পোহাতে হয়।

আমচাষি বকুল হোসেন বলেন, 'বাংলাদেশ থেকে গত বছর যে পরিমাণ আম রপ্তানি হয়েছে, তার অর্ধেকই আম্রপালি জাতের। রপ্তানি হওয়া আম্রপালির প্রায় ৭০ ভাগই নওগাঁর। অথচ এসব আম রাজশাহী ও চাঁপাইনবাবগঞ্জের নামে বিদেশে রপ্তানি করা হয়েছে। এর অন্যতম কারণ হলো, নওগাঁর আমচাষিদের পরিবেশগত সনদ না থাকা। রপ্তানিকারকেরা বিভিন্ন আড়ত থেকে আম কিনে সেগুলো চাঁপাইনবাবগঞ্জ ও রাজশাহীর আমচাষিদের সনদ দিয়ে বিদেশে রপ্তানি করেছেন। রপ্তানিকারকেরা যাতে সরাসরি আমাদের সঙ্গে কন্ট্রাক্ট ফার্মিং করে আম রপ্তানি করেন, নিরাপদ আম রপ্তানির ক্ষেত্রে আমরা সব শর্ত মানতে রাজি আছি।'

আবুল কালাম আজাদ বলেন, নওগাঁয় চলতি মৌসুমে ৩০ হাজার হেক্টর জমিতে আম চাষ হয়েছে। উৎপাদনের লক্ষ্যমাত্রা ধরা হয়েছে ৩ লাখ ৮০ হাজার মেট্রিক টন। গত বছর নওগাঁ থেকে ৪০ মেট্রিক টন আম বিদেশে রপ্তানি হয়েছে। এবার ৩০০ মেট্রিক টন আম রপ্তানির লক্ষ্যমাত্রা নেওয়া হয়েছে। এ জন্য কৃষকেরা যাতে উত্তম কৃষিচর্চা করে আম উৎপাদন করেন, সে জন্য তাঁদের কৃষি বিভাগের পক্ষ থেকে প্রশিক্ষণ দেওয়া হয়েছে।

নওগাঁয় কর্মশালা

- চলতি মৌসুমে জেলায় ৩০ হাজার হেক্টর জমিতে আম চাষ হয়েছে।
- উৎপাদনের লক্ষ্যমাত্রা ধরা হয়েছে ৩ লাখ ৮০ হাজার মেট্রিক টন।

কর্মশালা

নওগাঁর সাপাহারে মানসম্পন্ন আম উৎপাদনে রাসায়নিক সার ও কীটনাশকের ব্যবহার কমিয়ে জৈব সার ও প্রাকৃতিকভাবে রোগ দমনের পদ্ধতির ওপর জোর দিতে হবে। আম রপ্তানি বাড়াতে উত্তম কৃষিচর্চা নিশ্চিত করতে হবে। গতকাল বুধবার উপজেলা পরিষদ মিলনায়তনে বেসরকারি উন্নয়ন সংস্থা ঘাসফুল আয়োজিত কর্মশালায় বক্তারা এসব কথা বলেন। ঘাসফুলের সাসটেইনেবল এন্টারপ্রাইজ প্রজেক্টের (এসইপি) জ্ঞান বিনিময়বিষয়ক কর্মশালায় সভাপতিত্ব করেন সাপাহারের ইউএনও আব্দুল্যাহ আল মামুন। অনুষ্ঠানে প্রধান অতিথির বক্তব্য দেন রাজশাহী বিভাগীয় কৃষি সম্প্রসারণ অধিদপ্তরের অতিরিক্ত পরিচালক শামছুল ওয়াদুদ। বিশেষ অতিথির বক্তব্য দেন নওগাঁ কৃষি সম্প্রসারণ অধিদপ্তরের উপপরিচালক আবু হোসেন, উপজেলা কৃষি কর্মকর্তা শাপলা খাতুন প্রমুখ।

▪ নওগাঁ প্রতিনিধি

প্রথম আলো

আম রপ্তানি বাড়াতে উত্তম কৃষিচর্চা নিশ্চিত করতে হবে

প্রতিনিধি, *নওগাঁ*

মানসম্পন্ন আম উৎপাদনে রাসায়নিক সার ও কীটনাশকের ব্যবহার কমাতে হবে। জৈব সার ও প্রাকৃতিকভাবে রোগ-বালাই দমন পদ্ধতির ওপর জোর দিতে হবে। উত্তম কৃষি পদ্ধতি চর্চার (গ্যাপ) মধ্য দিয়ে মানসম্পন্ন আম উৎপাদন নিশ্চিত করতে পারলে রপ্তানি বাণিজ্যের অমিত সম্ভাবনা রয়েছে।

গতকাল বুধবার নওগাঁর সাপাহার উপজেলা পরিষদ মিলনায়তনে বেসরকারি উন্নয়ন সংস্থা ঘাসফুল আয়োজিত এক কর্মশালায় বক্তারা এসব কথা বলেন। ঘাসফুলের সাসটেইনেবল এন্টারপ্রাইজ প্রজেক্টের (এসইপি) জ্ঞান বিনিময়বিষয়ক কর্মশালায় সভাপতিত্ব করেন সাপাহার উপজেলা নির্বাহী কর্মকর্তা (ইউএনও) আবদুল্যাহ আল মামুন।

অনুষ্ঠানে প্রধান অতিথি ছিলেন রাজশাহী বিভাগীয় কৃষি সম্প্রসারণ অধিদপ্তরের অতিরিক্ত পরিচালক শামছুল ওয়াদুদ। বিশেষ অতিথি ছিলেন নওগাঁ কৃষি সম্প্রসারণ অধিদপ্তরের উপপরিচালক আবু হোসেন, সাপাহার উপজেলা পরিষদের চেয়ারম্যান শাহজাহান হোসেন প্রমুখ

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আম রপ্তানি বাড়াতে উত্তম কৃষি চর্চা নিশ্চিত করতে হবে

সোহেল চৌধুরী রাজা, শাপলাহাট (লালমণি) প্রতিনিধি: মনোলগ্রাম করে উপজেলায় বাজারভিত্তিক সবজি ও কীটনাশকের ব্যবহার কমিয়ে টেকসই সবজি ও প্রাকৃতিকভাবে রোগ-বালাই দমন পদ্ধতির ওপর জোর দিতে হবে। উত্তম কৃষি পদ্ধতি চর্চার (জাগ) মাধ্যমে মনোলগ্রাম করে উপজেলা নিশ্চিত করতে পারলে রপ্তানি পরিমাণের অধিক সম্ভাবনা রয়েছে। আম রপ্তানি বাড়াতে উত্তম কৃষি চর্চা নিশ্চিত করতে করে দুরবর্তী পরবর্তীর সাপাহার উপজেলা পরিষদ মিলনায়তনে যোগদানকারি উদ্যান সংস্থা বাংলাদেশ কারোটিকাল এন্ড কর্মশালায় বক্তারা এসব কথা বলেন।

বাংলাদেশের সাসটেইনেবল এগ্রিকালচার প্রজেক্টের (এসইপি) আম ভিত্তিক বিষয়ক কর্মশালায় সভাপতিত্ব করেন সাপাহার উপজেলা নির্বাহী কর্মকর্তা আবদুল্লাহ আল মামুন। অনুষ্ঠানে প্রধান অতিথি হিসেবে বক্তব্য রাখেন রাজশাহী বিভাগীয় কৃষি সম্প্রসারণ অধিদপ্তরের অতিরিক্ত পরিচালক শামসুল আরেফীন। বিশেষ অতিথি হিসেবে বক্তব্য রাখেন নওগাঁ কৃষি সম্প্রসারণ অধিদপ্তরের উপ-পরিচালক আবু হেনেম, সাপাহার উপজেলা পরিষদের চেয়ারম্যান শাহজাহান হোসেন, উপজেলা কৃষি কর্মকর্তা শাশনা সাবরিন প্রমুখ। কর্মশালায় বাংলাদেশী পলিটিকালকারে করে চাষের প্রধান উচ্চ ফলনশীল এবং জলবায়ু সহনশীল আমের জাত পরিচিতি বিষয়ক আলোচনা করেন উপজিলাবাগান্তর আধুনিক উদ্যানতত্ত্ব সংযোগ। চেয়ারের মুখ্য সংযোগ কর্মকর্তা মোস্তাফিজুর রহমান। আগত বক্তারা বলেন এসইপি প্রকল্পের বাস্তবায়নে কুলদহে মোগ মো. পাবেন।

বক্তারা বলেন, প্রধানত করে উদ্যানদের মধ্যে ধারণা ও ব্যাটিকিকভাবে সুযোগ সাপাহার আমার সম্ভাবনা রয়েছে। জলবায়ু সহনশীল আমের জাত উত্তম কৃষি চর্চার মাধ্যমে উদ্যানদের নিশ্চত করার ওপর গুরুত্ব আরোপ করতে হবে। উত্তম কৃষি চর্চার প্রধান শর্ত হচ্ছে অধিকের রাসায়নিক ও কীটনাশকের ব্যবহার হ্রাস করে দূরে অবস্থান করতে হবে। রাসায়নিক ও কীটনাশকের ব্যবহার কমিয়ে টেকসই সবজি ও প্রাকৃতিক সোহেলবাড়ে সবজি পদ্ধতি নিশ্চিত করতে করে। উত্তম কৃষি চর্চা নিশ্চিত করতে পারলে করে রপ্তানির অধিক সম্ভাবনা রয়েছে।

বাংলাদেশ এসইপি প্রকল্পের মাধ্যমে পরবর্তীর সাপাহার, সোহেলা ও নিয়ামতপুর উপজেলায় পরিবেশবান্ধব ও আন্তঃসেবার করে উদ্যানদের নিশ্চিতে কাজ করছে।


ছোলের জলে ভরা পড়ল কুলির মোবাইল হাইটি, নাম আরেশ প্রিয়া


মাইক্রিলি মহাসেরে মাধ্যমে জানা যাবে সমান মুক্তিযুদ্ধের ইতিহাস

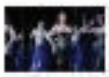

শুক্রবার সবার মন চলে? প্রথমে যে টিমের বিদেশ প্রসেসরিন


কমেরের মতো মোবাইল ব্যাংকিং বিভিন্নভাবে


আম রপ্তানি বাড়াতে উত্তম কৃষি চর্চা নিশ্চিত করতে হবে


জলবায়ুকে স্বাস্থ্যঝুঁকিতে তথ্য অভিজ্ঞতার বিষয় পরিষদ


ঘরে বসে রেখে বাস্তবীকে জ্বালী উদ্যমের বিদেশ মিশা


'ভুমি' গানে উদ্যমে তোলে নিয়ে কড় তুললেন ৪৯ বছর বয়সী মালাইকা


ইনিয়ে ডাক্তারিদের প্রধানমন্ত্রী শেখ হাসিনার জাতুনিন উদ্যানদের


সাত মাস ধরে চলা যুদ্ধ কতদিন চলবে তাদের প্রশিক্ষা

Naogaon DC Mehedi Hasan inaugurating the five-day Mango Fair on Nawjawan ground in the town on Tuesday by releasing balloons. Ghasful, a non-government organization, arranged the fair. PHOTO: OBSERVER

Images: Honorable Managing Director, PKSF, Dr. NomitaHalder, NDC along with other PKSF and Ghashful high officials visited the Ghashful activities during her tour at the Ghashful working area, Niamotpur, Naogoan dated on October 18, 2022. During her tour she had conducted course of works such as, Image -01: attended at the Environment Club meeting, Image- 02: inaugurated the Ghashfulbornedro e-commerce site supported by the SEP project, Image -03: visited the Ghashful SEP stall ,Image – 04:inaugurated the "Ghashful Development fair".

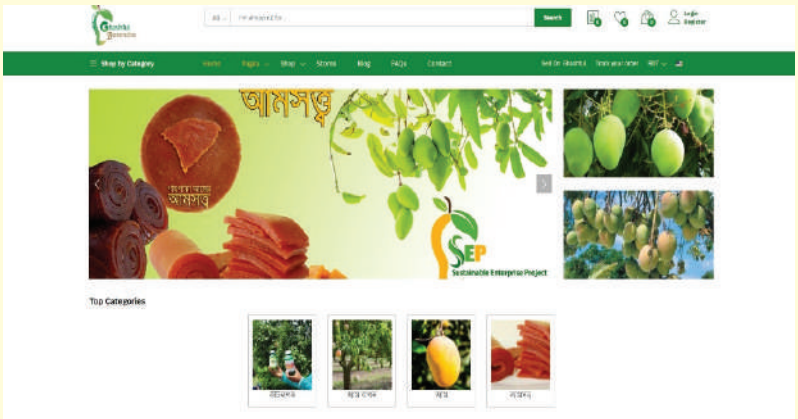


Image:Ghashful borendro e-commerce website/platform (www.ghashfulborendro.com), is the e-platform made by the support of Sustainable Enterprise Project (SEP) and because of this there are 800 mango entrepreneurs now able to get the opportunity for marketing their product at the premium market regionally and Nationally with handsome prices.

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SUSTAINABLE DEVELOPMENT

Sub Project Title : “Eco friendly Mango Production and Trade for Sustainable Development of the Enterprises”

Sustainable Enterprise Project (SEP)

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