

Smart Farming, Healthy Food

Developing Sustainable and Climate-Resilient Smallholder Vegetable Production and Supply Systems in the Barisal and Chittagong Divisions of Bangladesh

— Midterm Report Summary —



A partnership project of



Solidaridad

Supported by



Netherlands Enterprise Agency

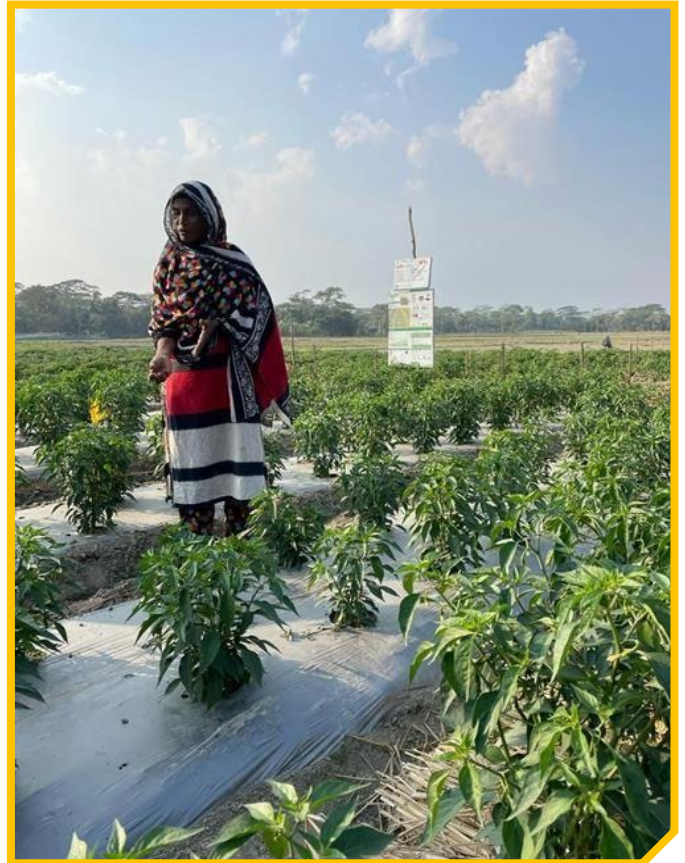
BACKGROUND

Smart Farming, Healthy Food (2020–2025) is a public-private partnership project to develop sustainable and climate-resilient smallholder vegetable production and supply systems in the coastal districts of Bangladesh. Supported by the Netherlands Enterprise Agency (RVO) and implemented through a partnership between Solidaridad, East-West Seed (Knowledge Transfer), and the Bangladesh Department of Agricultural Extension (DAE), the project is building the capacity of farmers on climate-smart agriculture to increase farm productivity and improve farmers' resilience through adaptation and mitigation measures.

Smart Farming, Healthy Food aims to support 25,000 vegetable farmers (65% women) to adopt climate-resilient production systems, and to establish global sustainability standards to improve productivity and quality. This is being done broadly through (1) sustainable and climate-resilient smallholder vegetable production, (2) improvement in the input and output market system, and (3) creating an enabling environment for climate-resilient and sustainable vegetable production and supply systems through the development of a climate-smart Bangladesh GAP (Good Agricultural Practices) curriculum and capacity building of local extension officers.

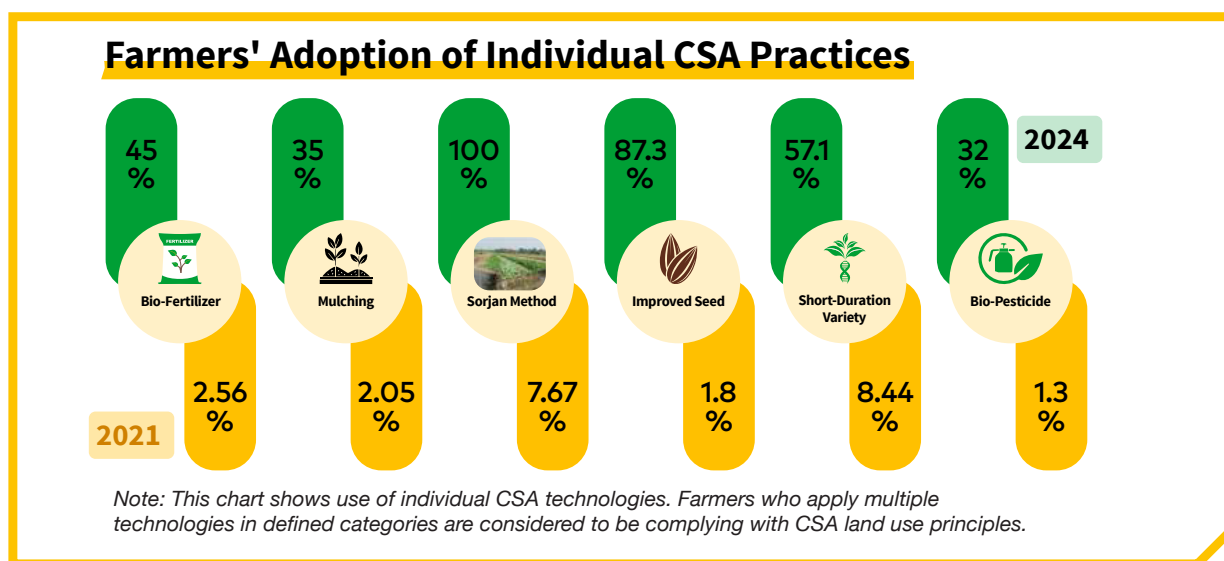
A midterm evaluation of the project was conducted in March 2024 to assess results, learn from the approach, and plan improvements for the remaining implementation period. The evaluation focused on relevance, effectiveness, efficiency, sustainability, and partnership collaboration. A mixed-methods approach was used, combining quantitative data from farmer surveys and qualitative data from key informant interviews and focus group discussions with key stakeholders. The integration of these data sources provided comprehensive insights, strengthened by program data and secondary literature reviews.

View the full midterm report [here](#).

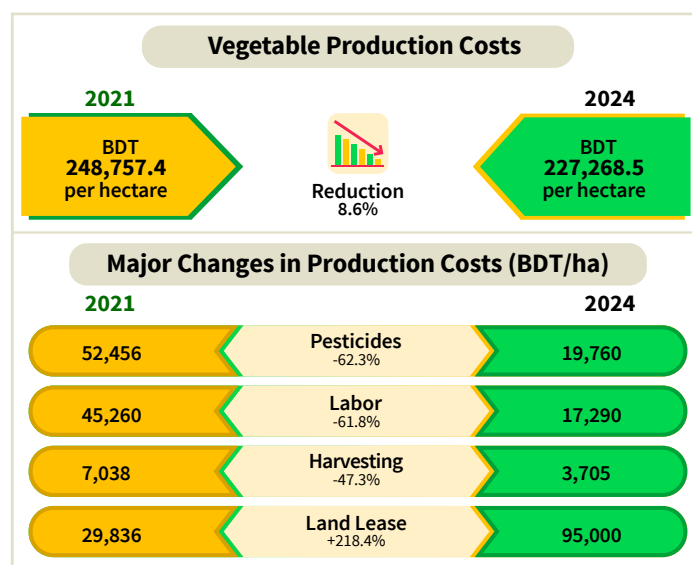


PATHWAY 1: SUSTAINABLE AND CLIMATE-RESILIENT SMALLHOLDER VEGETABLE PRODUCTION

According to the evaluation, 81.4% of the project farmers have developed their knowledge and capacity on climate-smart agriculture (CSA) through using techniques and technologies such as stress-tolerant seeds (87.3%), short-duration varieties (57.1%), and raised bed preparation (72.3%). Farmers’ knowledge and practices also changed significantly in land and water use planning, crop management, and pest management. 13,848 hectares of land are now under climate-smart agricultural practices.

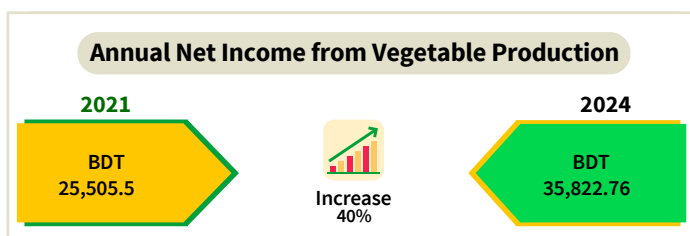
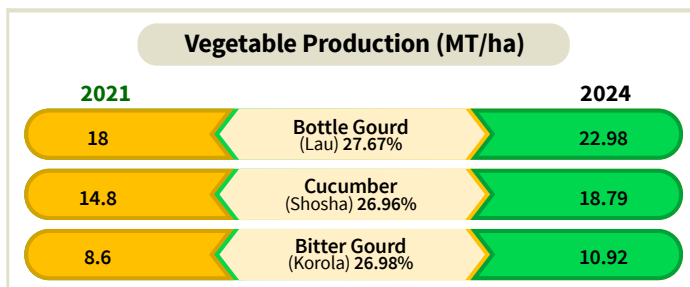


Adoption of climate-smart vegetable production has led to higher and better-quality yields for the farmers. The evaluation found that the production cost per hectare has decreased from BDT 248,757.4 at baseline (2021) to BDT 227,268.5, marking an 8.6% reduction due to the adoption of CSA. These practices encompassed improved input management (such as fertilizers, pesticides, and seeds), enhanced water management techniques, optimized transportation methods, labor efficiency, and other expenses.



The evaluation projects that 79% of farmers increased their yield by 27%, which is contributing to an increased supply of vegetables to the local and regional peri-urban markets. Greater production and supply of vegetables is also contributing to the business viability of the collection centers developed under Pathway 2.

Increased production—along with improved supply systems and the establishment of collection centers, which have reduced food waste and loss—have resulted in higher income for the farmers. For 69% of farmers, net income from vegetable cultivation increased 40% compared to the baseline evaluation conducted in 2021.



From Unused Land to Prosperity: A Tale of Transformation

After her family was displaced by river erosion, Morzina Akter began a journey from adversity to prosperity through CSA training. She established a cucumber plot on unused land, overcame soil salinity challenges through raised beds and soil amendments, and cultivated various vegetables. Vermicompost production and a seedling business enhanced vegetable quality while reducing costs. Morzina and her husband demonstrate how climate-smart technologies empower resilience and prosperity.



Mahabub Alam’s Climate-Smart Success

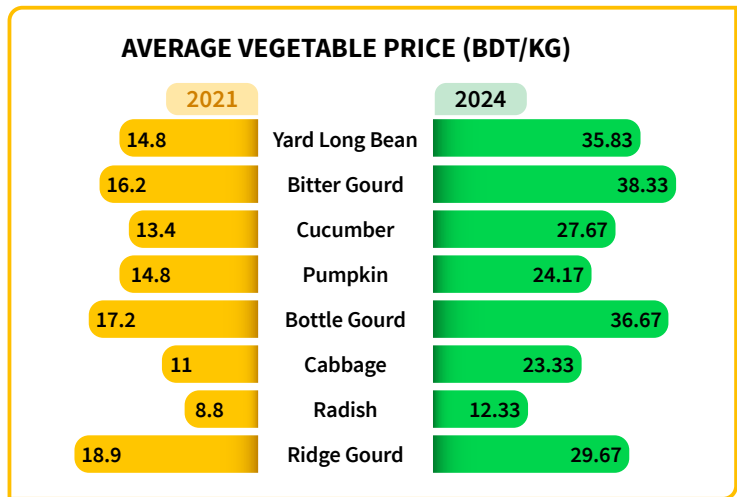
Mahabub Alam, a 31-year-old farmer, faced struggles with his bitter gourd yields. Traditional methods left his farm vulnerable to pests and diseases. By enhancing his knowledge of CSA techniques like pruning, spacing, and integrated pest control, he transformed his farm. Through these techniques, his farm flourished, yielding a remarkable 315% return on investment in one season and promising a sustainable future.

PATHWAY 2: IMPROVEMENT IN THE INPUT AND OUTPUT MARKET SYSTEM

100 vegetable production clusters are being established, and cluster-wide production and marketing plans are developed for improving ecosystem services for inputs, technologies, and marketing of vegetables. The project has supported the development of 40 collection centers in Noakhali, Patuakhali, and Bhola districts. This effort has led to wider access for farmers to input and output markets, as well as to advisory services.

The evaluation found that an estimated 12,500 farmers are well connected to markets. The collection center entrepreneurs are also providing CSA advisory services to the farmers. A total of 40 post-harvest management jobs have been created for young rural entrepreneurs (20 females and 20 males) in sorting, grading, and transporting vegetables.

The project is also involved in access to finance for the farmers and has developed effective linkages with Social Islami Bank Ltd. Loans totaling BDT 47.49 million are being facilitated for the farmers and the entrepreneurs to invest in CSA.





Yasin Bepari: Cultivating Success in Rural Development

Md. Yasin Bepari, a Noakhali native, has transformed his vegetable business, catalyzing sustainable rural development. His efforts have improved market access for over 1,020 vegetable growers and 7 suppliers by extending reach from local to regional markets, with ambition for national markets like Dhaka and Chittagong.

Generating a daily volume of 4.62 metric tons and an average net profit of BDT 23,100, Yasin's business has created jobs for 4 permanent and 8 temporary staff. He has invested in 2 new collection centers, land purchases, 2 motorcycles, and 2 motorized vans.



Finding Success with the Help of Collection Centers

Monir, a native of Subarnachar, has greatly increased his profit. In 2023, he earned BDT 350,000 by investing BDT 150,000 in cultivating four types of vegetables on 112 decimals of land.

He attributes his success to adopting CSA practices and utilizing a collection center for marketing, which reduced post-harvest losses by 30%. The center provided assistance and plastic crates for transportation, significantly cutting his costs. Additionally, sorting and grading services allowed him to command premium prices for his tomato, cucumber, and bitter gourd crops, which sold at BDT 35, BDT 27-28, and BDT 37-40 per kilogram, respectively.

PATHWAY 3: CREATING AN ENABLING ENVIRONMENT FOR CLIMATE-RESILIENT AND SUSTAINABLE VEGETABLE PRODUCTION AND SUPPLY SYSTEMS THROUGH THE DEVELOPMENT OF CLIMATE-SMART BANGLADESH GAP (GOOD AGRICULTURAL PRACTICES) AND CAPACITY BUILDING OF LOCAL EXTENSION OFFICERS

Smart Farming, Healthy Food successfully mobilized the engagement of stakeholders such as DAE, SRDI, BARI, BINA, BADC, Bangladesh Food Safety Authority, and local agricultural universities for promoting climate-resilient vegetable production and supply system development. The project provided training (facilitated by Wageningen University & Research) to 22 DAE extension workers on how to convey basic CSA advice to farmers. The extension officers then provided regular technical support and backstopping services to some of the project's lead farmers. In addition, a draft climate-smart Bangla GAP curriculum was completed at the end of 2023. The project successfully mobilized project partner DAE to pilot and demonstrate Bangla GAP. Piloting of the Bangla GAP curriculum has been initiated, and capacity development of 191 input traders was organized on CSA and Bangla GAP.



GAP consultation and sensitization workshop



DAE officers received training on CSA

LESSONS LEARNED

- The adoption of climate-smart technologies can significantly increase yield and reduce farm operation and production costs in the long run. However, the technology transfers and the adoption of CSA need practical demonstration, and a longer time frame is needed to change farmers' practices. For example, to adopt the sorjan method of cultivation requires huge capital for land preparation, such as excavation and trellising. Once the land is prepared, it gives return for at least 5 years, and the farmers are able to produce vegetables year-round, which increases their productivity, income, and profitability.
- Production of high-quality seedlings in seedling nurseries can reduce the cost for seeds, accelerate the crop cycle, and protect the crop from climatic hazards like early rain and flooding. Integrated pest management (IPM) practices are very important to ensure responsible and judicious use of pesticides, and better crop management practices are key to getting optimal yield.
- Farmers can improve water use efficiency and increase soil water retention through multiple small-scale technologies like furrow irrigation, drip irrigation, and mulching.
- Cluster development contributes to developing a market system to produce and supply safe, high-quality vegetables to the markets. It also improves backward and forward market integration for inputs and services.
- Local institutional capacity needs to be strengthened for planning and implementation of land and water use and for implementation of CSA practices and technologies in the local landscape.
- In addition to the project farmers, other farmers in the community are getting access to CSA advisory services from the collection centers and various social media platforms, to reach 47,480 farmers. The project interventions are well aligned with the principles of circular agriculture. At the farm level (production phase), the project interventions are targeting increased efficiency and reduced input use. This includes more efficient water use, improving soil health, significantly reducing the use of chemicals and pesticides, and using crop residues as mulch to improve soil quality and soil moisture levels. These practices, coupled with intercropping, support on-farm circularity by closing nutrient cycles.
- Smart Farming, Healthy Food has demonstrated a seed-to-market model that provides good production practices, climate-smart technologies, and input and output market access through project interventions. The model could be upscaled collaboratively by civil society organizations, the private sector, and DAE to demonstrate the result in other geographies.