Adaptation Story

## India

## **PROJECT DETAILS**

AF Funding: Small grant through Adaptation Fund Climate Innovation Accelerator (AFCIA)

## **OBJECTIVE**

• Introduction and scaling of hydroponic float-farming and aquaculture as an adaptive, integrated climate-resilient agricultural solution for vulnerable coastal communities of eastern India

**Local farmers** are taking their farming to the water, on floating farms, to improve food security while adapting to rising water levels through an innovative project in the vulnerable Sundarban region of India.

A climate resilient, adaptive agro-farming practice, successfully piloted in parts of India and Bangladesh, is being scaled up by a project funded by the Adaptation Fund in the climate vulnerable areas of the Sundarbans -- a biodiversity-rich World Heritage site of India that is facing the brunt of seawater ingress and flooding due to coastal storm surges.

Deepali Auliya, a 35-year-old woman farmer who lives with her two kids in Tipligheri village of the Sundarbans, recalls how cultivating vegetables was one of the least feasible activities during heavy rainfall or cyclone situations as her small farmland would get submerged in saline water. This forced her to go out to look for work as a casual labourer.

Many farmers like Deepali living in the Sundarban region have been facing climate change impacts over the years. Extreme weather



India

Sundarbans

Banglades

**Bay of Benga** 

Women beneficiaries of a Self-Help Group (SHG) nurturing the summer crops in a floatfarm in Amtoli village in Sundarbans. 72 members in eight SHGs manage and maintain 60 float-farms in Amtoli, which is now turning into a women's cooperative. (Photo by South Asian Forum for Environment, SAFE)

events and the devastating impacts of cyclones have only worsened in the last few decades. The frequency of storms has increased by 47% in the last decade alone. Sea-level rise has been increasing at the rate of 3.02 cm a year and is amplifying risks such as flooding, storm surges, saline water intrusion, and coastal erosion. After super-cyclones Amphun in 2020 and Yaas in 2021, the total damage in Sundarbans was devastating, but estimated loss in the project area was less than 10%.

The Sundarbans is also home to the largest mangrove ecosystem in the world. However, mangrove forests are constantly being altered by the erosional forces of the sea and wind along the coast and by the enormous loads of silt and other sediments that are deposited along the myriad estuaries. Human activities such as deforestation have also altered the landscape, which accelerates erosion. With considerable amount of river water getting diverted upstream for irrigation and other uses, salinity in the mangrove swamps has moved further inland. Conventional farming methods in the region are tillage-based, and water and chemical-intensive, which is further damaging the ecosystem.

"My husband didn't go back anymore to the forest, he said this is a much better job. I can stay back at home. We are thankful to SAFE and the funding agencies who gave us this scope" - Mrs. Madhumita Dolui, a local farmer in Tipligheri village of Sundarbans Regenerative farming initiatives that work to restore and work with the environment have the potential to transform such regions and help communities rebuild after climate disasters.

Funded by the Adaptation Fund Climate Innovation Accelerator (AFCIA), the initiative is part of the first round of AFCIA grants financed by the Fund and administered by the UN Development Programme. The project involves 12 local villages and 2,200 households, which as a ripple effect, supports thousands more in the wider agrarian economy.

The key feature of the project includes a trial of floating farms, run by the South Asian nature Forum for Environment (SAFE) that not only assures food and livelihood security, but also ensures nutritional security and agro-business for marginalized communities, especially in the post-pandemic world.

The intervention naturalizes hydroponic float-farming and aquaculture as an adaptive, integrated climate-resilient practice for climate vulnerable communities. It borrows from the traditional UNESCO heritage practice of Bangladesh, called 'Haor' farming. This type of farming enables

## **PROJECT BY THE NUMBERS**





Self-Help Group members in Tipligheri Village of Sundarbans, harvesting winter coriander leaves, a cash crop that sells at a high price, from the array of float-farms. Tipligheri houses 100 float-farms engaging nearly 120 women farmers. (Photo by SAFE)



hydroponic technology in organic float-farms, which is fed by a solar desalination unit and micro-irrigation system. This further integrates advanced aquaculture (fish and crab) and agrobiodiversity conservation, ensuring both habitat conservation and alternative livelihoods for local farmers and fishing communities.

"With super-cyclones and then (COVID-19) lockdown, survival with kids and old parents was like a nightmare. My husband, who is a construction labourer in Andhra Pradesh, came back home, but had no jobs, no earnings. He thought of going to the forest for fish and crab but that was so risky. SAFE organized trainings for float-farming and fish and crab. This all came as a boon. We both could engage in this. We together earned almost INR 8000 a month (US\$ 100). That was sufficient. My husband didn't go back anymore to the forest, he said this is a much better job. I can stay back at home. We are thankful to SAFE and the funding agencies who gave us this scope", said Mrs. Madhumita Dolui, a local farmer in Tipligheri village of Sundarbans.

The intervention has directly benefitted more than 12,000 beneficiaries including farmers and fishing communities through capacity building, technology cooperation, financial inclusion and socio-economic mainstreaming. Strengthening of local institutions, women empowerment and entrepreneurial leadership development are integral to the project. It has also created opportunities for livelihoods for COVID-19 migrants and advocates for health preparedness and digital literacy, especially for women.

Through its cyclic design, the float farming method leverages circular economic benefits - recycling the components of compost, agrowastes, and recycled slaughter house garbage, which otherwise end up in

landfills. The structural architecture of the farm, which is usually made of bamboos and kept afloat using drums, contains vegetables cultivated in grow bags, and is resilient to loss and damage when facing environmental hazards like cyclones and floods. The farmers also have access to an android app and are part of the Climate Information Networking (CIN) to help them prepare for storms through risk aversion strategies.

The communities have been engaged from the first line of assessments, implementation planning, financial plans as well as in monitoring and evaluation. Youth have been trained for baseline surveys and assessments for indexing community vulnerability, while progressive farmers have been engaged in monitoring and evaluation. Participation was ensured in crop-cycle planning, collective practices in horticulture, fish and crab farming, resource budgeting and allocation.

The profit on sales of the produce in the floating farms ranges from 65-70% with a profit-volume ratio of 3:2 and a break-even period of 18 months for six cropping cycles. The growth is manifested with increased number of float farms, beneficiaries, yield, and crop varieties. Through the course of this project, 20 floats in Sundarbans have turned into 240 in about nine months.

Market access for farmers has been one key benefit from this method. The farms allow crops to be rotated with wider market demands. SAFE trains farmers in maximising the benefits of their produce, including by being provided improved access to banking. Capacity building of men and women of all age groups has ensured that everyone is equally engaged and benefits from this initiative.

Ms. Bisakha Mondal, Group Leader and farmer of a Women's Self Help Group in Kakdwip village of the Sundarbans, says, "Float farms look like one vast garden loaded with fresh vegetables and I won't have to worry now about my kitchen garden or the homestead pond turning saline, as these floats are much more manageable and easy to work with. Our group can collectively harvest all vegetables and fish in the seasonal cycles that we plan together. We have about over 500 women in my village now trained in either float farming techniques or fish and crab farming. This is the first time we went to town for training and got our own bank accounts. Each of us would agree that we all immensely benefited from this exposure and by selling the produce at local markets and also having nutritious food for our families at the same time."

Mrs. Madhumita Dolui, a local farmer in Tipligheri village of Sundarbans. (Photo by SAFE)