

Ecosystems-based adaptation keeps water running in Bhojdari even in dry months

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- Ecosystems-based Adaptation (EbA) provides essential ecosystem services that serve as a buffer providing water and food security in instances of reverse migration.

- Bhojdari, a village in Sangamner taluka of Ahmednagar district in Western Maharashtra, was one of the first villages where the Indo-German Watershed Development Programme (IGWDP) was successfully implemented by the Sangamner Bhag Sahakari Sakhar Karkhana and Watershed Organisation Trust (WOTR) in 1996.

- **Maharashtra faced a severe drought in 2002–03, which triggered the initiation of the Climate Change Adaptation project by WOTR.**

- [Of the 33 villages where this project was implemented, Bhojdari is one of the examples of successful EbA interventions.](#)

Bhojdari, in Ahmednagar district of Maharashtra, is a village in the rain-shadow region of the Western Ghats; it is in the upper catchment and has no river, dam or canal nearby, but has sufficient water even in dry months.

Bhojdari's water self-reliance even withstood the return of migrants to their home village in the wake of the COVID-19 pandemic and lockdown. It proved that villages with an ecosystems-based adaptation (EbA) approach to agricultural policy are better placed to provide food security and livelihoods to returning migrant workers.

"Even though our village has no major water body and is partly hilly, we have been tanker-free and self-sufficient in our water needs since the early 2000s," said Pushpavika Hande (45), an aarogya sevika

(health worker) from Bhojdari.

Bhojdari has not faced an acute water shortage since the early 2000s, when the benefits of the EbA work began to be realised. The project was implemented by the Pune-based [Watershed Organisation Trust](#) (WOTR), as part of the [Indo-German Watershed Development Programme](#). The land in Bhojdari is said to be hard, and the geology of the village does not support groundwater recharge, said Niraj Joshi, Senior Researcher with the [WOTR Centre for Resilience Studies](#) (W-CReS).

EbA adds to traditional watershed management

EbA is defined by the United Nations Convention on Biological Diversity as "the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people adapt to the adverse effects of climate change." EbA interventions are aimed at helping people adapt to climate change through sustainable use of ecosystem services and biodiversity of the particular agro-ecological region while following participatory governance.

A recently published paper by the

Watershed Organisation Trust

(WOTR), the

WOTR Centre for Resilience Studies

(W-CReS), and

TMG Think Tank for Sustainability

titled, "

Scaling Ecosystem-based Adaptation to Climate Change in Maharashtra, India

", states that EbA in Maharashtra is "exemplified by participatory watershed development — soil and water conservation from ridge to valley with afforestation — together with other climate adaptive measures such as sustainable agriculture, weather-based agro-advisories, water budgeting and biodiversity conservation".

Both the scope and the benefits of EbA are far wider than traditional watershed management, said Girish Jathar, assistant director of the Bombay Natural History Society (BNHS) who worked on the Climate Change Adaptation Project (CCA Project) in the rainfed regions of Maharashtra, Madhya Pradesh, and Andhra Pradesh Project, which started in 2009 and was implemented by WOTR in collaboration with NABARD. "Under traditional watershed management, all the activities are aimed at conserving water to increase the economic prosperity of the farmers in the region. This does not take into account the changing climate and biodiversity and possibilities for mitigating climate risk in the region," he said.

K. J. Joy, founding member of the

Society for Promoting Participative Ecosystem Management

(SOPPECOM) said that the emphasis of most watershed development programmes, the way they got implemented, is on increasing cropped area and irrigation.

Only the supply side augmentation factors of water management are considered under traditional watershed management, while factors such as setting up systems to equitably distribute water and water use prioritisation are not.

"In an EbA-based approach, on the other hand, you look at land use capability classification, i.e. using land as per its capability, and restoring land back to its land capability classification such as grassland or shrubland, as opposed to converting it all into cropped land. There is a tendency among farmers to increase land under cultivation as a risk-proofing method under drought conditions, but with EbA, with protective irrigation if you can stabilise the crops then the desire to convert lands not suited for crops to agricultural land will reduce because you can produce much more with the cropped land, with some assured inputs of water," Joy said.



A farmer field school in progress in Bhojdari village of Ahmednagar district of Maharashtra. Photo by Watershed Organisation Trust.

Adapting to climate change

Maharashtra faced a severe drought in 2002–2003, which triggered the initiation of the Climate Change Adaptation in Rainfed Regions of Maharashtra, Madhya Pradesh, and Andhra Pradesh Project (CCA Project), which started in 2009 and was implemented by WOTR in collaboration with NABARD.

The need for climate change adaptation was felt in the early 2000s, when despite appropriate watershed management, the villagers could not cope with the changing climate, says Prashant Kalaskar, assistant manager and in charge of WOTR's regional resource centre at Sangamner. "We cannot control the climate, but we must learn to adapt," he said.

Under the CCA project, WOTR conducted a slew of activities that incorporated the EbA approach: local communities were trained to maintain a people's biodiversity register (PBR) and how to identify and combat climate disasters; villages were mapped and irrigation models were created; springs were rejuvenated; lantana (weed) was cleared and bamboo trees were planted; and where applicable, fish ladders were built to help fish go upstream for breeding. The water stewardship initiative which focuses on demand-side management (water budgeting) was also implemented.

"The PBR brought about a few changes in people: they realised the value of the biodiversity they had lost. Previously, they used to sow 20 varieties of rice, but in recent times they had started cultivating only one variety. They realised that their indigenous seeds were more drought-resilient and decided to reintroduce this diversity in their crop patterns," said Jathar.

"Promoting local agrobiodiversity in food crops may be a better solution, as these native crops being local could be more resilient to climate change. Besides, farmers can respond better because they know how these crops respond to varying weather situations," said Marcella D'Souza, director of W-CReS.

"Of the 325 families in Bhojdari, around 180 have farmland and cultivate both kharif and rabi crops. Through effective water budgeting, these families have been able to cultivate their land without water shortage problems," said Pushpavika Hande.

"With effective watershed management in Bhojdari, some farmers who had borewells even started sowing a third crop. Increased agricultural productivity led to a substantial increase in incomes and quality of life, and distress migration reduced," said Niraj Joshi, senior researcher at W-CReS.

Ganesh Rajapure, assistant general manager at WOTR said that the climate change adaptation project further improved the agricultural productivity here, and the agriculture season increased from six months to ten months. "Once the drinking water problem was solved, the crop patterns were also changed by WOTR in consultation with the farmers. Earlier, only bajra was cultivated here, but later the villagers started sowing wheat, onions, leafy vegetables, and some fruits," he noted.

In June, many villages run out of water every year, but Bhojdari still has enough drinking water for another month, says Ganpat Bhagaji Hande, the police patil of Bhojdari and a member of the village development committee (VDC).

The benefits of this EbA approach were felt during the current pandemic and lockdown, when around a hundred residents returned to Bhojdari for the village's annual fair. Several stayed back and every week, 15–20 people have been arriving in Bhojdari, says Ganpat Hande. Despite this additional pressure on the village's water resources, Bhojdari could provide water to all the residents, including its incoming migrant workers.

Can EbA be upscaled?

There have been small ecosystem restoration success stories, but EbA needs to be implemented as a concerted strategy in collaboration with different government departments. "Ecosystem restoration has proven to be beneficial to restore livelihoods in several places in India as well as abroad," observed Jathar. "Lamkani village in Dhule district of Maharashtra is one such example. This village restored its grasslands successfully, and it led to livelihood security."

Marcella D'Souza of W-CReS said that in order to scale up EbA practices, the different sectors – land use, water resources, agriculture, biodiversity – need to work together as this will bring synergistic benefits. "Farmers have suffered huge losses during this lockdown period, which they will try to compensate during the coming season and groundwater extraction will be one of the impacts of this. The impact of excessive extraction of groundwater for intensive agriculture this year will impact the aquifers and will have negative impacts on farming and land desertification in the near future. Villages, where groundwater dries up, could face desertification in the near future," said D'Souza.

"The problems we face in scaling EbA is that there is no one-size-fits-all formula for this," said Jathar. The strategies that work in one area will not necessarily work in another if the people do not respond positively.

To scale up the EbA approach, people need to adopt a framework that includes components such as watershed management, biodiversity conservation, people's participation, and the revival of local traditional knowledge, Jathar said. "People need to decide the steps they need to take after understanding the climate and geography of their land. The focus needs to be on restoring ecosystems. If your ecosystem is strong, you'll have better ecosystem services. And if this happens, you're definitely better suited to adapt to climate change."

Joy said that to scale up the EbA approach, the village communities (gram sabhas and panchayats) need to be empowered for resource regulation and also financially empowered. Since one of the stumbling blocks is that governmental departments work in silos, officials dealing with agriculture, water resource development, soil conservation, livestock, energy, small-scale industries need to work together. Existing government schemes such as the

Mahatma Gandhi National Rural Employment Guarantee Scheme

could be dovetailed into implementing EbA interventions, as EbA schemes too require a lot of labour work.

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