

EbA Info Brief Series #6

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## Why Ecosystem-based Adaptation for Water Management?

UPSCALING ECOSYSTEM-BASED ADAPTATION (EbA) TO CLIMATE CHANGE IN THE RAINFED REGIONS OF MAHARASHTRA, INDIA



Acute water scarcity and frequent droughts are major challenge in the rainfed regions of Maharashtra. Photo credit: WOTR

### Challenges to water management in the rainfed regions of Maharashtra

- Acute water scarcity is a critical environmental challenge faced by the poor in Maharashtra state—one of the worst affected in the country. Around 82% of Maharashtra's cultivable area is rainfed. Droughts are a frequent phenomenon and have increased seven-fold in the last five decades. Access to water is further hampered by the fact that around 91% of the state is covered by hard rock<sup>1</sup>. Moreover, the frequency of heavy floods, which have increased six-fold in the last five decades, pose a serious challenge to agriculture in the state<sup>2</sup>.
- Though Maharashtra has the highest number of dams in the country, less than one-fifth of its agricultural land is irrigated. With the growing dependence on groundwater predominantly for agriculture, groundwater levels are falling rapidly, by one to two metres every year<sup>3</sup>. Water-intense crops like sugarcane exacerbate such water scarcity even more.
- The groundwater in rural<sup>4</sup> as well as several urban areas across the state is contaminated to different degrees. This includes physio-chemical and bacterial contamination<sup>5</sup>. In some districts water is also contaminated by fluoride<sup>6</sup>.
- Maharashtra needs to overcome significant challenges to its river basins. As per the Maharashtra Water Resources and Regulatory Authority, four of the five river basins in the state have seen a drop in river discharge by more than 50%. Insufficient environmental flows aggravate the challenge of maintaining adequate water quality<sup>7</sup>.

### EbA as a systemic approach for Water Management

Ecosystems such as forests, wetlands and grasslands play an important role in the water cycle. Healthy ecosystems purify and store water as well as mitigate floods. Water in turn is critical to the health of ecosystems. An ecosystem-based approach to water management would involve the conservation and restoration of ecosystems through interventions such as water harvesting, water budgeting and appropriate crop choices, measures to improve water use efficiency as well as participatory water governance. Examples of activities in India include river rejuvenation and river basin management projects, watershed

development, water stewardship, and provisions for environmental flows.

#### What is Ecosystem based Adaptation (EbA)

The United Nations Convention on Biological Diversity (CBD) defines EbA 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” (CBD, 2009)

# Opportunities for upscaling EbA in water management

The severe water scarcity in Maharashtra needs to be addressed urgently by exploring the following entry points to protect ecosystems:

- Water management is an important state subject covered in policies such as the Maharashtra Groundwater (Development and Management) Act 2009 and the Maharashtra State Water Policy 2019, as well as institutions such as the Maharashtra Water Resources Regulatory Authority. Many of these initiatives have specific provisions that can help to promote an ecosystem-based approach to water management. For instance, the state water policy in its preamble points to reducing degradation and halting biodiversity loss, and specifically discusses the need to recognise rivers, aquifers and other water bodies as ecological systems.
- Well implemented, large-scale soil and water conservation programmes along watershed lines can augment the supply of water<sup>8</sup>. However, there is a need to review traditional watershed development (WSD) to incorporate an ecosystem-based approach. For instance, review the effectiveness of WSD structures to address both droughts and floods of increasing intensity; introduce interventions to enhance the ecosystem responses such as the conservation of inland wetlands, inland freshwater fisheries, protection of spring sheds, and reforestation to strengthen embankments and revive streams and rivers. The active engagement of the local community in implementing WSD will capture specificities on the ground and encourage 'ownership' of projects.
- A review of important government programmes in the water sector, such as the promotion of farm ponds<sup>9</sup>, Gaalmukt Dharan and Gaalyukt Shivar (Tank Desiltation)<sup>10</sup>, PoCRA<sup>11</sup>, etc. should be carried out to make these programmes more equitable and environment friendly in line with the EbA approach.
- Sustainable groundwater management can strengthen the health of ecosystems. Optimal water use can be promoted through community participation and demand side interventions like water budgeting and improving water-use efficiency to inculcate behavioral changes in the community. Central schemes such as the Atal Bhujal Yojana (ATAL JAL), the promotion and strengthening of Water Users Associations (WUA), and innovative efforts by NGOs such as WOTR's Water Stewardship approach<sup>12</sup> can potentially be upscaled across the state.

## ABOUT THE PROJECT

As part of the [International Climate Initiative](#) by the German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU), the [Watershed Organisation Trust \(WOTR\)](#), based in Pune, India, and Berlin-based [Think Tank TMG Research](#), aim to develop a roadmap for upscaling of EbA in Maharashtra. This project entails a series of inclusive and participatory multi-stakeholder dialogues at both the local and state levels, through which WOTR and TMG seek to identifying promising [EbA initiatives](#). An important aspect of these processes is to identify the enabling environment for EbA to be implemented and sustained at a broader scale. These stakeholder dialogues are expected to contribute to building the required political, and societal support for EbA at the country level.

<sup>1</sup>GSDA. (2014). Dynamic Ground Water Resources of Maharashtra (2011-12), accessed on 13th January 2021,

[https://gsda.maharashtra.gov.in/english/admin/PDF\\_Files/1559974566\\_Talukawise\\_GWA2011-12\\_compressed.pdf](https://gsda.maharashtra.gov.in/english/admin/PDF_Files/1559974566_Talukawise_GWA2011-12_compressed.pdf)

<sup>2</sup>CEEW. (2020). Preparing India for Climate Events. accessed on 13th January 2021, [https://www.ceew.in/sites/default/files/CEEW-Preparing-India-for-extreme-climate-events\\_10Dec20.pdf](https://www.ceew.in/sites/default/files/CEEW-Preparing-India-for-extreme-climate-events_10Dec20.pdf)

<sup>3</sup>Hindustan Times, 23rd October 2018 (as given by the GSDA)

<sup>4</sup>Dhawde, R., et al. (2018). Physicochemical and Bacteriological Analysis of Water Quality in Drought Prone Areas of Pune and Satara Districts of Maharashtra, India. *Environments*, 5(5), 61.

<sup>5</sup>Tambekar, D. & Neware, B. (2012). Water Quality Index and Multivariate Analysis for Groundwater Quality Assessment of Villages of Rural India. *Science research reporter*, 2(3), 229-235.

<sup>6</sup>Madhnure, P., & Malpe, D. (2007). Fluoride Contamination of Groundwaters in Rural Parts of Yavatmal District, Maharashtra—Causes and Remedies. *Gondwana Geol Mag*, 11, 127-35.

<sup>7</sup>Sharad K. Jain & Pradeep Kumar (2014) Environmental Flows in India: Towards Sustainable Water Management. *Hydrological Sciences Journal*, 59:3-4, 751-769. DOI: <https://doi.org/10.1080/02626667.2014.896996>.

<sup>8</sup><https://www.caritasindia.org/assessing-soil-and-water-conservation-impact-in-maharashtra-madhya-pradesh>, accessed on 13th January 2021

<sup>9</sup>A Case Study on the Farm Ponds Issues, accessed on 13th January 2021, <https://thewotrblog.wordpress.com/2019/07/23/farm-ponds-in-semi-arid-areas-of-maharashtra-a-case-study/>

<sup>10</sup><https://wotr.org/publication/gaalmukt-dharan-gaalyukt-shivar-desiltation-of-tanks-scheme-a-drought-proofing-intervention>, accessed on 14th January 2021

<sup>11</sup><https://dbt.mahapocra.gov.in>, accessed on 14th January 2021

<sup>12</sup>D'Souza, M., Kale, E., Pinjan, H. (2019). A Step towards Quenching Rural India's Thirst, Experiences and Learnings from the Water Stewardship Initiative in Maharashtra, Watershed Organisation Trust (WOTR), Pune, [https://wotr-website-publications.s3.ap-south-1.amazonaws.com/40\\_Water\\_Stewardship\\_Initiative\\_in\\_Maharashtra.pdf](https://wotr-website-publications.s3.ap-south-1.amazonaws.com/40_Water_Stewardship_Initiative_in_Maharashtra.pdf)

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