



## East Kolkata Wetlands (EKW): A community led nature-based solution to combat climate change



**Government:** Department of Environment, Government of West Bengal, India

**Region:** South Asia

**Sector(s):** Land use, Wetland conservation, Climate resilience, Carbon sequestration

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Community farmers at EKW

## Summary

Since the 1880s, the East Kolkata Wetlands (EKW) have been a locally adopted nature-based solution (NBS), positively impacting the lives of millions residing in and around Kolkata. Nature-based solutions refer to the sustainable management and use of natural processes to tackle socio-environmental issues.

**150,000**

livihoods depend on  
East Kolkata Wetlands for  
farming, fishing, and  
forest products

The wetland complex constitutes approximately 260 sewage-fed fishponds, salt marshes and settling ponds. On a daily basis, they naturally recycle 910 million litres of the city's untreated sewage by providing a basin for aerobic treatment of wastewater (a biological process that uses oxygen to break down organic contaminants and other pollutants like nitrogen and phosphorous). Additionally, Sewage fed fisheries (SFF) gradually improve the water quality. The wetlands also play a crucial role in moderating the impacts of floods, droughts, heatwaves, and they sequester carbon dioxide from the atmosphere. This model demonstrates a long-term practical application of a nature-based solution, mitigating the need for expensive artificial wastewater treatment while ensuring food security and livelihood opportunities for local communities.

Spanning over 12,500 hectares and 7 Gram Panchayats, the wetlands consist of Kolkata, Bidhannagar, South and North 24 Parganas Municipal Corporations. At least 150,000 people are dependent on EKW for their livelihood. Sewage inflow across shallow *bheries* (ponds) augments plankton growth, acting as fish feed, reducing the overall cost of fish production. The wetlands have ensured a sustained production of over 50,000 MT of vegetables and more than 20,000 MT of fish per annum.

EKW is recognised as the world's largest natural resource recovery ecosystem by Ramsar Secretariat, is included in the list of 'Wetlands of International Importance' and declared as a Ramsar site in 2002. Considering the wetlands' ecological and socio-economic value and its crucial role in recharging groundwater, regulating hydrological flow, and treating wastewater, the West Bengal Government passed the East Kolkata Wetlands (Conservation and Management) Act of 2006. The Act underlines the constitution and responsibilities of the East Kolkata Wetlands Management Authority (EKWMA) for effective conservation and management of the EKW.

## Highlights

**910 million lts.**  
treated naturally by  
EKW and utilised as  
nutrient-rich fluids for  
irrigation in agriculture  
and feed in aquaculture.

- The East Kolkata Wetlands function as a natural climate solution, sequestering nearly 60% carbon dioxide from wastewater inflow through absorption by soil sediment, microbial and plant-animal biota.
- A local populace of 150,000 is dependent on EKW for natural resource-based livelihoods including pisciculture, paddy farming and vegetable cultivation.
- The EKW cumulatively yields sustained annual production of over 50,000 MT of vegetables, >20,000 MT of fish, thereby contributing to food security in the state.
- Annually, 2,850 hectares of paddy lands are irrigated with treated nutrient rich wastewater from the EKW.
- 15.5 million residents in the metropolitan region benefit from EKW's positive environmental impacts on the ecosystem, such as air quality regulation, groundwater recharge, food and water security, flood control, moderation of heatwaves.
- 910 million litres of sewage is naturally treated daily (65% of total daily sewage) at little to no cost. It saves approximately INR ~460 crores annually on artificial sewage treatment plants (also termed as ecological subsidy).
- Land use is maintained in line with regulatory requirements under Wetlands (Conservation and Management) Rules, 2017 and East Kolkata Wetlands (Conservation and Management) Act, 2006 thus preventing illegal transformation of land use.



A sewage inflow barrage gate at Bantala, EKW

## Enabling conditions

- The EKW is enabled by sewage inflow from Kolkata city. Its hydrological gradient (the elevation differences between the water table in different portions of a wetland) ensures the distribution of sewage to different parts of the wetland. Indigenous practices of using pre-settled sewage for pisciculture, farming and irrigation is a sustainable way of utilising sewage in agriculture and culturing fish. Wetland communities, with their generational knowledge and traditional low-impact livelihoods, play a pivotal role in maintaining these wetlands.
- EKWMA, along with other stakeholders, has made efforts to generate public awareness about the wetlands' intrinsic value to the environment. Demarcating the EKW's boundary, reporting on land use change and illegal encroachment, assessing water quality have been some of the measures. The EKWMA develops and implements five-year management plans to address developmental and conservation aspects.
- The EKW is also under the purview of the Wetlands (Conservation and Management) Rules 2017 notified by MoEFCC under the Environment (Protection) Act, 1986. The Act provides a regulatory framework for integrated management of wetlands and Ramsar sites.

## Integrated Management Plan by EKWMA

- EKWMA is developing institutions and mechanisms to strengthen local governance for zonal demarcation and management.
- Abating water pollution through waste segregation, dredging of channels, zero-plastic zones.
- Restoring habitats for priority species and controlling invasive species.
- Enhancing sustainable livelihood opportunities via crop diversification, pond desiltation and establishment of new hatcheries to promote fish culture.
- The focus is also on addressing community needs such as the provision of potable water and health facilities.
- A Wetland Interpretation Centre for public engagement, education and awareness has also been established.

## Challenges

- 95% private land ownership poses a significant challenge to preventing land conversion and encroachment.
- Socio-economic vulnerability of local communities is exacerbated by climate change induced risks.
- There has been a trend towards disengagement with traditional forms of livelihoods which can lead to the breakdown of this community-managed model of resource recovery.
- Lack of awareness among local communities regarding the EKW boundary demarcated by EKWMA is another challenge.



Floodplains at EKW

**Key lessons learned:**

- It's important to recognise that the wetland communities are dependent on the EKW resources for their livelihoods. Conserving the wetlands is crucial to sustain these. Engaging the community in dialogue and consultation to identify problems, gaps and formulating need-based solutions is crucial to upholding a community-based approach towards the conservation and management of wetlands.
- Sustainable economic upliftment of wetland communities by enhancing market-linked opportunities is needed. Fish and farm produce must be remunerated to sustain this community-managed model in the long run.
- The nodal agency EKWMA has a crucial role in tackling current challenges such as real estate encroachment, effective sewage inflow, desiltation of canals/ponds and access to sanitation facilities for wetland communities.

## More information

Management Authority - East Kolkata Wetland Management Authority (EKWMA),  
Department of Environment, West Bengal.

### Credit to:

- 1) Md. Ghulam Rabbani, Chairperson, EKWMA & Hon'ble Minister-in-Charge, Dept. of Environment, West Bengal.
- 2) Ms. Roshni Sen (IAS), Member Secretary, EKWMA & Additional Chief Secretary, Dept of Environment, West Bengal.
- 3) Ms. Neelam Meena (IAS), Principal Secretary of Consumer Affairs Dept & former Director of IESWM, Dept of Environment, West Bengal.
- 4) Ms. Tripti Shah (IFS), Chief Technical Officer, EKWMA.
- 5) Ms. Barna Majumdar, Environmental Engineer, Dept of Environment, West Bengal.
- 6) Ms. Abhipsha Ghosh, Former State Climate Fellow, West Bengal