

PROJECT PROFILE

Green-Gray Resilience India

CHALLENGE

Extreme flooding and community resilience

OPPORTUNITY

Sustainable alternative for canal restoration

SOLUTION

Combine nature-based and civil infrastructure

YEAR

2022

PARTNERS

Local Governments for Sustainability – South Asia
Swiss Re Foundation and Swiss Re
Kochi Municipal Government
bechtel.org

Green-Gray Resilience is a project to support the Kochi municipal government mitigate the effects of extreme flooding and the implications for the health and development of vulnerable communities along Kochi's canals.

In the Indian state of Kerala, the city of Kochi's canals are polluted, unhealthy, and frequently flooded. Kochi was once 70 percent water and 30 percent land – it's now reversed.

Low-income households are the most affected, and their vulnerability increases with deficient operations and reduced maintenance. Moreover, their insecurity is exacerbated by the frequency and intensity of extreme flooding, creating the need for resilient, sustainable alternatives to infrastructure improvements.

The Kochi Municipal Government oversees several canals and restoration is underway. The canals in Fort Kochi (in the western part of Kochi) are a major source of livelihoods, tourism, and infrastructure for climate resilience. They are also contaminated, largely neglected in terms of restoration, and the most vulnerable to floods. City officials are focusing on these canals and embracing nature-based solutions (NBS) integrated with traditional infrastructure.

Demonstrate to Scale

Given the attention on Fort Kochi, there's an opportunity to rethink, reorient, and retool canal restoration projects. The solution is a smart, sustainable, and innovative approach using green-gray infrastructure (GGI) – integrating NBS (e.g., mangroves) and engineering and construction techniques and technologies – supported by risk transfer mechanisms to incentivize positive risk-taking to deliver GGI, as well as protect and maintain the natural assets.

The goal of the [project](#) is to position to scale the adoption of NBS in conventional infrastructure development as a viable alternative for community flood resilience and sustainable economic development for India's Fort Kochi canals.

Besides community benefits like better health outcomes, increased tourism, and greater resilience against extreme flooding, a desired state is a solution for the Kochi

government and local stakeholders to deliver GGI in multiple canals.

Several canals have been identified by the municipal government for GGI evaluation. The overall approach starts with a pilot project in one canal, then test and position the innovation for scale in a second and third canal, and then transition for scale.

The pilot phase involves: 1) front-end work; 2) pilot project execution; 3) operational readiness and transition to the Kochi municipal government. The front-end work will build the technical and impact basis of GGI for the Kochi government, affected communities, and local stakeholders and prepare them to implement the project in the selected canal.

Innovation

Building upon a foundation of learning from NBS and GGI projects globally, the innovation in this project is the means, methods and delivery model.

