Background

Urban surface water bodies get pollutants from surface runoff and seepage. This causes nutrient enrichment in the surface water and increases invasive plants (e.g., water lettuce) and eutrophication of water. Dhanmondi and Gulsan lakes in Bangladesh (3,73,700 m^2 and 16,000 m^2), Nayagaon lake in India (34,521 m^2) and Nagdaha in Nepal (25,080 m^2) represent the urban surface water bodies. These water bodies are polluted due to agricultural runoff, sewage seepage and direct use of water by the local people. The Floating Treatment Wetland System (FTWS) is simple in design and structure and can be easily applied on surface water bodies to remediate the pollutants. FTWS is an eco-technological means to improve water quality by employing floating rafts, that support shallow-rooted plants to float freely. The biofilm developed on the roots removes nutrients and pollutants and improves water quality.

Objectives

1. Research on remediation of polluted surface water through microcosm study.

2. Investigate the effect of locally available plant species on the performance of FTWS.

3. Investigate the applicability of FTWS for lake restoration under various climatic conditions.

4. Generate protocol/technical guidelines on the design, construction, operation, and maintenance of FTWS at a field scale.

5. Communicate the outcomes to relevant stakeholders and policy-makers about FTWS, and create awareness on existing water quality problems and innovative solutions.

Outputs/Outcomes

1. Strengthen regional cooperation and partnerships among researchers, organizations to produce research evidence contributing to global change and sustainability.

2. Microcosm component of the project to serve as thesis studies for graduate students at an institutional level.

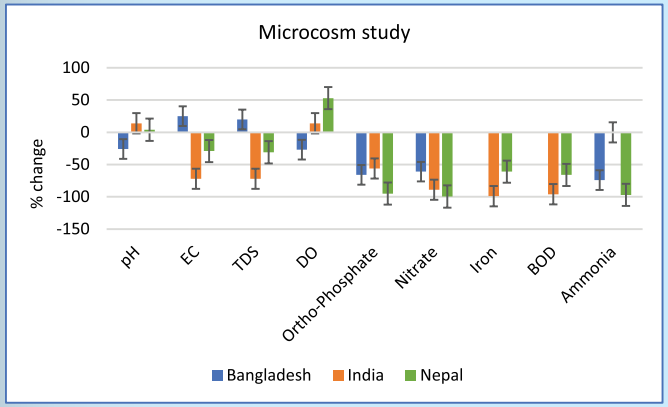
3. Generate a preliminary evaluation of the FTWS performance to remediate eutrophied surface water bodies in urban settings.

4. Field installation of FTWS prototypes in the water bodies to promote sustainable and low-cost green technology as a critical part of ecosystem-based adaptation practices at community level.

Activities

Microcosm studies of FTWS	4
Training on water quality analysis	2
Master's/PhD thesis of a graduate student on the microcosm study	3
Construction and installation of FTWS field prototypes	3
Research articles publications of microcosm study	2
Community programs for public consultation and interaction with community people	3
Policy workshops with participation of local representatives	3
Water quality test to monitor the installed FTWS prototypes	6
FTWS introduction video for public awareness	2
Preparation of policy briefs	3

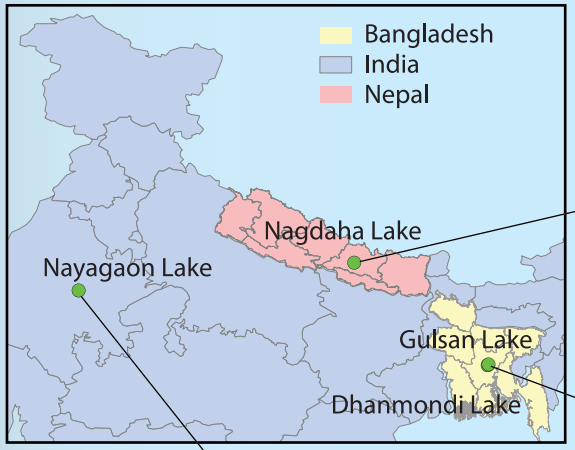
Results



Experimental setup (Bangladesh)

Root growth observation (India)

Project sites



Nepal

India

Bangladesh

Project Lead: The Small Earth Nepal (SEN)
Funded by: Asia-Pacific Network for Global Change Research (APN)
Collaborators: Central University of Rajasthan (CURAJ), Center of Research for Environment, Energy and Water (CREEW), University of Dhaka (DU), Kathmandu Valley Water Supply Management Board (KVWSMB), Tribhuvan University (TU), University of Rhode Island (URI), University of Yamanashi (UY)
Project countries: Bangladesh, India and Nepal
Duration: 1 October 2021 - 30 September 2023

For more information

The Small Earth Nepal (SEN)
Phone No: +977-9847694139
Post Box No.: 20533, Kathmandu, Nepal
Email: info@smallearth.org.np
www.smallearth.org.np

Floating Treatment Wetland System (FTWS)

Sustainable Green Technology to Remediate Polluted Surface Water Bodies