

Stakeholder Consultation Workshop

on

Urban Ecosystem-Based Adaptation for Climate Resilience in Sri Lanka

13th August 2026

Organized by

Department of Zoology and Environmental Management

University of Kelaniya

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Project Partners



Introduction

Ecosystem-Based Adaptation (EbA) has emerged as a sustainable approach to climate adaptation that utilizes biodiversity, ecosystem services, and natural infrastructure to reduce climate-related risks and improve urban resilience. Approaches such as wetland conservation, urban green spaces, urban forests, and other nature-based solutions can contribute to flood mitigation, temperature regulation, water management, and biodiversity conservation while providing social and economic benefits. Despite growing recognition of the importance of Ecosystem-Based Adaptation, its implementation in urban areas often faces policy, institutional, technical, and capacity-related challenges. Furthermore, information on ongoing adaptation initiatives, implementation experiences, and stakeholder perspectives remains fragmented across different sectors and organizations. Addressing these challenges requires greater collaboration and knowledge sharing among government agencies, local authorities, academia, and environmental organizations involved in urban planning, environmental management, disaster risk reduction, and climate adaptation.

Hence, this stakeholder consultation workshop is organized under the project “Urban Ecosystem-Based Adaptations for Climate Resilience: A Comparative Study of Policy, Practice, and Capacity Building in Sri Lanka.” The workshop aims to provide a platform for relevant stakeholders to exchange knowledge and experiences on urban climate adaptation initiatives, discuss current challenges and opportunities, identify capacity-building needs, and explore pathways for strengthening Ecosystem-Based Adaptation practices in Sri Lanka. The outcomes of the workshop will contribute to the research project by providing valuable stakeholder insights and supporting the development of recommendations for enhancing urban climate resilience through ecosystem-based approaches.

Objectives of the workshop

Main Objective

To facilitate stakeholder engagement and knowledge exchange on practices, and capacity-building needs related to Urban Ecosystem-Based Adaptation measures in Sri Lanka.

Specific Objectives

1. To understand current climate change impacts and adaptation challenges in urban areas of Sri Lanka.
2. To share information on ongoing and planned projects on ecosystem-based adaptation measures.
3. To identify institutional, and technical challenges in implementing Ecosystem-Based Adaptation measures.
4. To promote collaboration among government agencies, local authorities, academia, and environmental organizations.

Stakeholder Participation

The workshop brought together representatives from key institutions involved in environmental management, urban development, climate change adaptation, disaster risk reduction, water management, research, and sustainable development.

The participating institutions included:

- Central Environmental Authority
- Climate change secretariate, Ministry of Environment
- National Water Supply and Drainage Board
- Sri Lanka Land Development Corporation
- Disaster Management Centre
- Department of Meteorology
- Urban Development Authority
- National Physical Planning Department
- National Building Research Institute
- International Water Management Institute
- United Nations Development Programme
- Environmental Foundation Limited
- University of Kelaniya
- University of Peradeniya



Figure 1: Participants of the workshop

Workshop proceedings

Opening and introductory session

The workshop commenced with participant registration, followed by the welcome address and introductory remarks. The opening session established the context for the consultation and highlighted the importance of collaboration among institutions in addressing emerging climate-related challenges in urban areas. An overview of the project and the objectives of the stakeholder consultation was subsequently provided, introducing the overall purpose of the project.

Presentations by Experts

The second session focused on knowledge sharing among participating institutions. The session included the following presentations:

- Ecosystem-Based Approach for Environment Management by Dr. Ajith Gunawardena, Director, Environment Education and Awareness, Central Environmental Authority (Figure 2).
- Climate Resilience in Urban Settlements by Mr. Leel Randeni, Director, Climate Change Secretariat, Ministry of Environment (Figure 3).
- Wetlands as Nature-Based Solutions for Resilience under Increasing Uncertainties by Dr. Chathurangi Wickramaratne, Researcher and Freshwater Ecologist, International Water Management Institute (Figure 4).
- Green–Blue Infrastructure for Climate-Resilient Cities: Research Insights and Future Directions from Colombo, Sri Lanka by A. A. S. G. Wijesundara, MPhil Researcher, University of Kelaniya (Figure 5).

The session provided an opportunity for participants to share perspectives on existing practices and initiatives and to consider potential of ecosystem-based approaches to address climate-related risks in Sri Lankan urban areas.



Figure 2



Figure 3



Figure 4



Figure 5

Interactive group activity

The group activity aimed to develop a conceptual urban Ecosystem-based Adaption (EbA) strategies for an assigned urban ecosystem by identifying climate risks, ecosystem assets, and suitable EbA interventions. The participants were divided into five groups based on different urban ecosystem types, namely urban wetlands, urban water bodies, urban residential areas, urban parks and green open spaces, and urban/peri-urban agricultural ecosystems. A total of 1 hour and 45 minutes was allocated for group work preparation. During this period, ecosystem conditions, climate-related challenges, and management gaps were assessed to develop suitable EbA strategies. Institutional arrangements, resource requirements, and potential implementation challenges were also considered. 10 minutes were allocated to each group for the presentation and discussion of their proposed EbA strategies and key findings (Figure 6).



Figure 6: Group work preparation and presentations

Key Findings of Group Activity

Climate-related vulnerabilities, ecosystem pressures, and institutional gaps across five major urban and peri-urban ecosystems were identified through the group activity. The findings further highlighted ecosystem-specific vulnerabilities and potential EbA interventions for strengthening climate resilience and ecosystem services.

1. Urban wetlands

Urban wetlands were identified as ecosystems highly vulnerable to flooding and drought, with these climate-related risks being intensified by urbanization, land-use change, pollution, and encroachment. Such pressures have reduced the ecological integrity of wetlands and diminished their capacity to provide essential ecosystem services, including flood regulation, water purification, habitat provision, and biodiversity conservation. Wetland degradation has consequently increased the vulnerability of surrounding communities, particularly those located in flood-prone areas and those dependent on wetland resources for their livelihoods.

Vulnerable areas and communities

- Surrounding communities located in flood-prone areas
- Communities depend on wetland resources for their livelihoods

Key gaps/problems

- Lack of Stakeholder coordination.
- Non-alignment between existing policies and Acts.

These measures are expected to enhance flood retention capacity, improve water quality, maintain habitat connectivity, and support long-term ecosystem sustainability. However, inadequate financial resources, limited technical capacity, insufficient public awareness, and weak institutional coordination remain significant constraints to effective implementation.

2. Urban water bodies

Urban water bodies were identified as increasingly vulnerable to flooding, drought, and declining water quality because of untreated wastewater discharge, solid waste dumping, habitat destruction, invasive species, encroachment, and uncontrolled urban development. Collectively, the proposed interventions have the potential to improve ecological conditions while increasing the adaptive capacity of urban aquatic systems.

Vulnerable areas and communities

- Flood-prone areas within the Kelani River Basin
- Kolonnawa and other encroached areas associated with urban water bodies
- Low-income communities
- Adjacent communities are located near urban water bodies
- Communities dependent on aquatic resources, particularly fishing communities

Key gaps/problems

- Inadequate laws and regulation implementation.
- Lack of human resources for monitoring.
- Lack of funds
- Lack of modern technologies
- Poverty and education
- Lack of centralized sewerage systems for highly urbanized areas (Kotte and Battaramulla)
- Lack of continuous monitoring

Proposed EbA strategies

- Application of floating treatment wetlands

In addition to the proposed EbA strategies, strengthening research activities, improving institutional data sharing, enhancing environmental law enforcement, expanding wastewater treatment systems, and establishing effective monitoring programmes were identified as important supporting measures for improving ecosystem resilience and adaptation outcomes. Nevertheless, limited financial resources, inadequate technical expertise, and the absence of effective long-term monitoring systems continue to constrain the implementation of these measures.

3. Urban residential areas

Urban residential areas were identified as highly susceptible to climate-related hazards, particularly urban heat island effects, flash flooding, air and water pollution. These pressures contribute to the degradation of environmental quality and increase the vulnerability of urban

areas to climate-related risks. Such interventions are expected to reduce urban heat stress, enhance stormwater management, improve environmental quality, and strengthen community resilience.

Vulnerable areas and communities

- People living in flood-prone areas (slums and shanties)
- High population density areas
- Areas with improper land-use planning
- Elderly and disabled populations living in condominium flats and other residential areas affected by heat stress

Key gaps/problems

- Lack of knowledge and data
- Ecological aspects should be addressed in planning
- Reliable funds
- Rules and regulations should be updated
- Less intersectoral coordination among the key institutes

Proposed EbA strategies

- Roof garden
- Green walls
- Urban farming

Complementary planning and regulatory measures were also proposed, including the strengthening of building codes, improved stormwater management, appropriate zoning and land-use planning, and the establishment of buffer zones around environmentally significant areas. However, limited integration of adaptation measures into urban planning processes, weak coordination among responsible institutions, and the absence of measurable implementation indicators may reduce the effectiveness of these interventions.

4. Urban Parks and Green Open Spaces

Urban parks and green open spaces were recognized as critical components of urban climate resilience due to their contribution to temperature regulation, flood mitigation, biodiversity conservation, recreation, and public well-being. However, increasing urbanization, land-use change, pollution, and invasive species have reduced the capacity of these ecosystems to deliver environmental and social benefits. These measures are expected to improve stormwater management, reduce urban temperatures, enhance biodiversity, and strengthen ecosystem functioning.

Key gaps/problems

- Lack of labours
- Lack of funds
- Weak environmental law enforcement
- Land encroachment

Proposed EbA strategies

- Expansion of urban tree cover
- Adoption of permeable pavements
- Promotion of green building concepts
- Habitat restoration
- Development of blue-green infrastructure networks

Despite their potential benefits, implementation may be constrained by land scarcity, competing development priorities, and limited monitoring mechanisms for assessing intervention effectiveness.

5. Urban and peri-urban agricultural ecosystems

Urban and peri-urban agricultural ecosystems were identified as increasingly threatened by urbanization, land-use conversion, water pollution, solid waste disposal, and wetland filling. These pressures adversely affect food production systems, biodiversity conservation, nutrient cycling processes, and microclimate regulation functions that are essential for sustainable urban development. Such interventions are expected to improve water regulation, support agricultural productivity, strengthen livelihood security, and enhance community engagement in sustainable land management practices.

Vulnerable areas and communities

- Areas affected by wetland filling
- Abandoned paddy fields
- Communities living in low-lying areas
- Urban populations are experiencing food security issues
- Urban poor communities

Key gaps/problems

- Policy implementation gaps
- Lack of community awareness
- Lack of interconnection between key stakeholders
- Research gaps
- Knowledge dissemination

Proposed EbA strategies

- Canal restoration
- Agricultural tourism initiatives

Additional adaptation priorities identified by the group included the conservation of urban and peri-urban wetlands and the implementation of appropriate flood mitigation measures. However, weak stakeholder coordination, challenges in policy implementation, and limited community acceptance remain important barriers to achieving long-term adaptation outcomes.

Comparative analysis across the five groups

Common climate risks identified by all groups were flooding, drought, urban heat stress, biodiversity degradation, and increasing pressure from urbanization. Urban Wetlands and Urban Water Bodies showed the strongest focus on hydrological regulation and disaster risk reduction. Urban Parks and Residential Areas emphasized human wellbeing, heat mitigation, and recreational benefits. Agricultural Ecosystems uniquely highlighted food security and livelihood resilience. Governance weaknesses, lack of awareness, funding shortages, inadequate enforcement, and weak institutional coordination emerged as recurring themes across all groups.

Key issues and way forward identified through stakeholder discussion

The discussion during the way forward session highlighted several practical issues influencing the ground-level implementation of EbA and identified priority areas for strengthening Urban EbA in Sri Lanka.

Stakeholder coordination emerged as a major challenge. Experts highlighted that limited coordination among relevant stakeholders can reduce the effectiveness of climate adaptation initiatives. The Lack of alignment among certain policies, plans, and institutional responsibilities were also identified as an issue requiring greater attention.

The discussion further emphasized the gap between policy development and practical implementation. Sri Lanka already has a considerable number of environmental policies, acts, plans, and regulatory mechanisms. However, implementation at the ground level remains challenging. Experts suggested that existing policies and regulatory frameworks should be reviewed to identify gaps, overlaps, and areas where implementation could be strengthened. Limited staff availability and insufficient human resources and technical capacity were also identified as factors affecting effective monitoring, enforcement and implementation.

Data accessibility and sharing among institutions was identified as another important aspect. Experts noted that several government agencies already maintain valuable information on disasters, infrastructure damage, and environmental impacts. However, such information is often maintained separately by different institutions and may not be readily accessible to other

relevant stakeholders. Improved data sharing would support planning, research, and evidence-based decision-making.

The need for site-specific and ecosystem-specific management approaches was also emphasized. Participants noted that environmental and climate-related problems can vary considerably among watersheds and river basins. Therefore, a single management strategy may not be suitable for all locations. Instead, adaptation and ecosystem management measures should consider the specific characteristics, pressures, and needs of individual river basins, watersheds, and urban ecosystems.

The Way Forward session emphasized that successful EbA implementation requires stronger interaction between those involved in research, policy development, and planning and those directly involved in field-level implementation. Scientific knowledge should not remain limited to reports and publications. It should be communicated and translated into forms that support practical decision-making. The discussion also identified awareness and capacity building as important components of successful Urban EbA implementation.

Expert questionnaire on urban ecosystem vulnerability and adaptive capacity

An expert questionnaire on urban ecosystem vulnerability and adaptive capacity was administered to participating stakeholders. The questionnaire was designed to obtain expert knowledge to support the project's assessment of urban ecosystem vulnerability under concepts aligned with the IPCC framework.



Figure 7: Expert questionnaire session

Conclusion

The Stakeholder consultation Workshop provided a valuable platform for bringing together stakeholders from diverse institutions to discuss the role of Ecosystem-Based Adaptation in strengthening urban climate resilience in Sri Lanka. The combination of expert knowledge sharing, the expert questionnaire on urban ecosystem vulnerability and adaptive capacity, and participatory group activities enabled stakeholders to exchange experiences, identify practical challenges, and explore context-specific nature-based solutions for urban areas. The workshop also highlighted the importance of cross-sectoral collaboration, effective coordination, and

stronger links between research, policy, and practice. The outcomes and stakeholder perspectives generated through the workshop will contribute to the ongoing project activities and support the development of recommendations for strengthening Urban EbA and climate resilience in Sri Lanka.

Annex: Workshop Agenda

Time	Title
08:00	Registration
08:30	Welcome Address by Dr. Lashya Manage , Lecturer, Department of Indigenous Medicinal Resources, Gampaha Wickramarachchi University of Indigenous Medicine
08:45	Speech by Prof. U. P. K. Epa , Head/Department of Zoology and Environmental Management, University of Kelaniya
09:00	Project Overview and Introduction to the Workshop by Dr. B. G. N. Sewwandi , Senior Lecturer, Department of Zoology and Environmental Management, University of Kelaniya
09:15	Ecosystem-Based Approach for Environment Management by Dr. Ajith Gunawardena , Director, Environment Education, Central Environmental Authority
09:30	Climate Resilience in Urban Settlements by Mr. Leel Randeni , Director-Climate Change Secretariat, Ministry of Environment
09:45	Refreshments
10:15	Wetlands as Nature-Based Solutions for Resilience under Increasing Uncertainties by Dr. Chathurangi Wickramaratne , Researcher & Freshwater Ecologist, International Water Management Institute
10:30	Green–Blue Infrastructure for Climate-Resilient Cities: Research Insights and Future Directions from Colombo, Sri Lanka by A. A. S. G. Wijesundara , MPhil Researcher, University of Kelaniya
10:45	Introduction to the Group Activity by Snr. Prof. M. I. M. Mowjood , Department of Agricultural Engineering, University of Peradeniya
11:00	Interactive Group Activity - I
12:00	Lunch
13:00	Interactive Group Activity - II
13:45	Presentation and Discussion (10 min/group)
14:45	Way forward by Prof. N. D. K. Dayawansa , Department of Agricultural Engineering, University of Peradeniya
15:00	Vote of Thanks by Snr. Prof. L. D. Amarasinghe , Department of Zoology and Environmental Management, University of Kelaniya
15:15	Tea