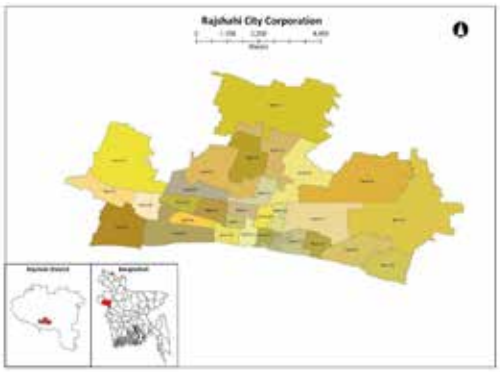
Urban Greening and Biodiversity Enhancement

Through Pilot Plantation under the Urban LEDS II Project

Rajshahi, Bangladesh

Introduction

Rajshahi, a metropolitan city in north-west Bangladesh is an education hub and famous for its Rajshahi silk. Geographically, Rajshahi is situated within Barind Tract, 23 m (75 ft) above sea level. It also serves as the divisional headquarters of Rajshahi division as well as the Rajshahi administrative district. In the past, the city had taken notable efforts to reduce air pollution, led by the Rajshahi City Corporation (RCC), such as Zero Soil Project. Rajshahi is one of the 'model cities' under the Urban-LEDS II project. As part of its sustainability and climate strategy/actions under the project, Rajshahi is focusing on improving and better managing its open green spaces, raising citizen awareness about biodiversity, and promoting outdoor activities.



Summary

Total Geographical area : 97.18 sq kms
Total Population : 448,087 (2011)
Population Density : 2487 persons/sq.km

Snapshot and the challenges addressed

Rajshahi is recognised for its relatively abundant open spaces and flora, making it one of Bangladesh's greenest cities. This is due to an array of initiatives aimed at realising its ambition of becoming a clean and environmentally friendly city.

Rajshahi mapped a section of its trees on a GIS platform, created a ward-level Natural Asset Map, and a Pictorial Tree Handbook for its citizens in order to improve and better manage their urban green spaces and biodiversity. Through these actions, Rajshahi City Corporation identified an area for a ground-level urban greening project.

In December 2020, a demonstration plantation project was initiated to transform a 2.5-km long stretch of open space, located on Rajshahi's Kolpona-Talaimari river embankment, into an eco-friendly public space. Local and naturalised plant species that support several ecosystem services, including pollination, were identified. A detailed design and 3D model of this demonstration plantation scheme was developed and implementation successfully completed in February 2021. Over 1000 saplings were planted along 32 targeted slopes of the river embankment. Further, the plantation is also being maintained regularly. This urban greening project has helped to transform the river embankment into an area rich in biodiversity, enabling residents and visitors to experience the benefits resulting from improved green spaces.

Project Objectives

The objectives of the pilot project were to improve and manage Rajshahi's open green spaces better, generate awareness among the stakeholders about the local biodiversity and the ecosystem services provided, promote outdoor activities, thereby contributing to active participation, social interaction, and better physical and mental well-being among the residents.

Rationale of intervention

Rajshahi's Greenhouse gas (GHG) emissions amounted to 630,254 tonnes of CO_2e in 2017-2018[1]. As anthropogenic GHG emissions rise, they accumulate in the atmosphere and warm the climate. Warming is exacerbated in urban areas as compared to the surrounding rural areas due to the Urban Heat Island effect. According to Rajshahi Development Authority (RDA) land use data, in the last 20 years (2003-2021), residential and commercial land use (or structures or development) has increased by 14.84% and 9.52% in the RCC area, replacing land area under open space and water bodies. The percentage of open space has been reduced from 11.09% to 4.5% based on the data from RDA master plan, 2021. The city has experienced a rapid increase in maximum temperature in the tune of, 0.039^0C/year[2]. Green spaces contribute significantly to mitigating the impacts of increase in temperature and provide several other critical ecosystem services. Hence, this initiative to improve the green cover of the city utilizing the available open space and sensitising local community as well as tourists about the biodiversity of Rajshahi City, is very apt and significant. It improves awareness on the significance of open green spaces for sustainable urban development.

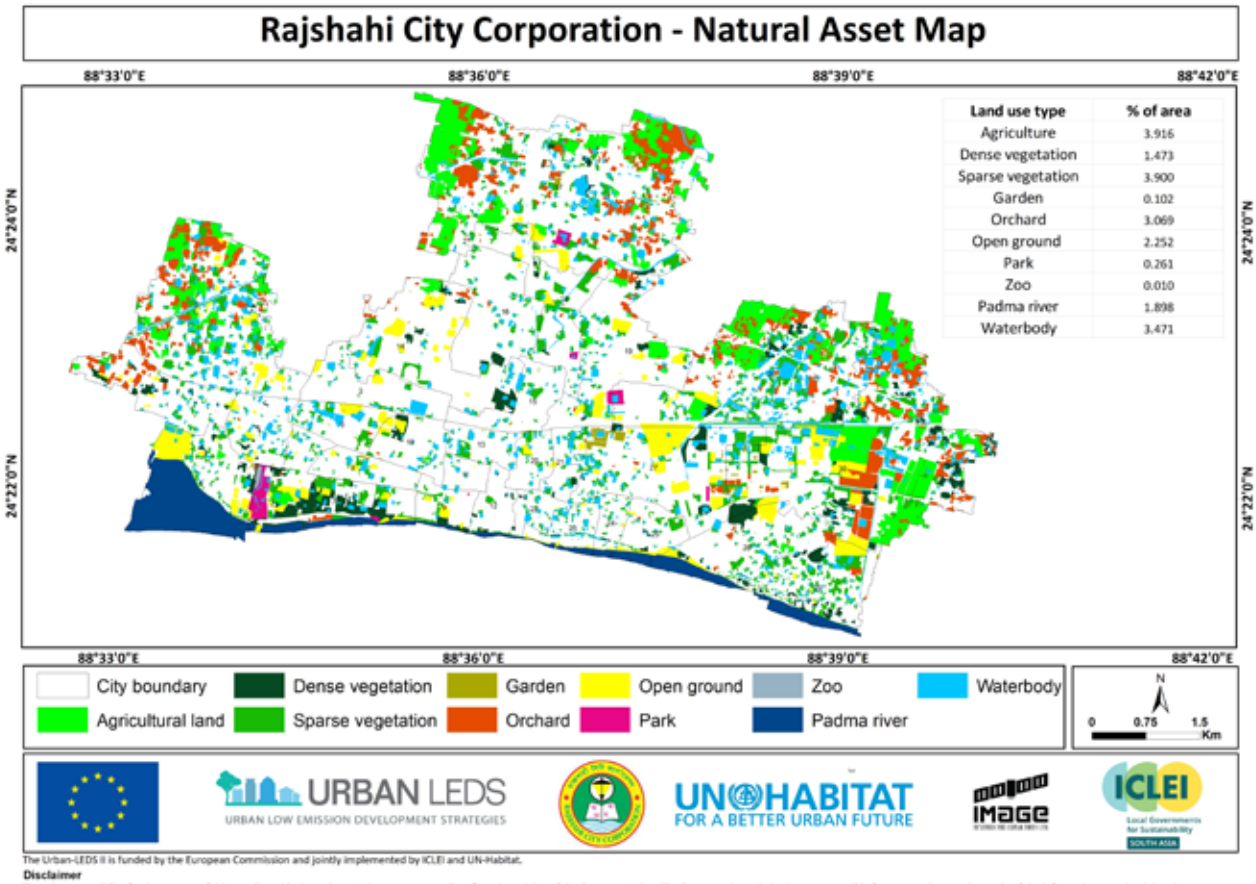
Organisations, Stakeholders, Location, period of implementation

The Urban-LEDS II project supported cities to implement pilot projects that demonstrate the potential of a low-emission development approach, as well as helped participating local governments to package projects for larger-scale financing and rollout. The Urban-LEDS II project was implemented by Rajshahi City Corporation (RCC) with support from ICLEI South Asia and UN-Habitat. A local nursery was contracted to implement the task of pilot-scale plantation using local and naturalised plant species, as well as maintenance. The maintenance of the plantation will then be handed over to RCC who have gained expertise through the project. The demonstration pilot for a plantation scheme along 2.5 km long stretch of open space at Rajshahi's Kolpona-Talaimari river embankment was initiated in December 2020 and plantation was completed by February 2021.

Project Intervention

Input

Biodiversity experts, through the support of the Urban-LEDS II project, had conducted on-ground surveys to help understand and document the diversity of flowering plants in a selected area of the city. GIS-based tree maps depicting the spatial distribution of various tree species had been prepared. A natural asset map capturing Rajshahi's natural resources was also developed. Common trees were labelled and captured in a pictorial handbook to help raise awareness among citizens and promote conservation.



The Urban-LEDS II is funded by the European Commission and jointly implemented by ICLEI and UN-Habitat.

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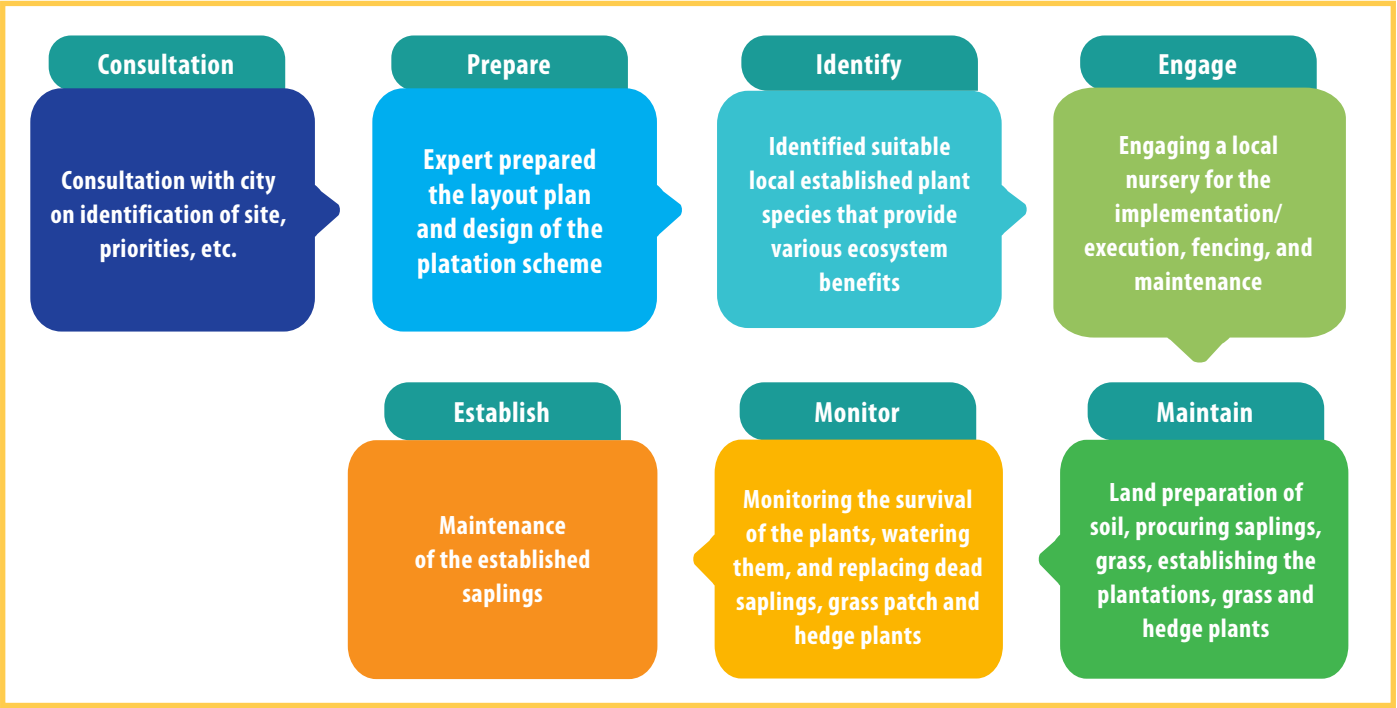
Process



Output

Successful establishment and maintenance of more than a thousand saplings along 32 slopes of Rajshahi's Kolpona-Talaimari river embankment was successfully completed in October 2021.

Outcome

The city of Rajshahi has forged ahead with its efforts on urban greening and biodiversity improvement. The RCC gained experiential knowledge that will aid in upscaling the efforts to the rest of the city and framework could be adapted by cities in the country.

The importance of using local and established species and biodiversity enhancement has been established. The urban greening efforts have transformed the area and the local community will be able to visualise the importance of urban green spaces.

Planning process	Opportunities
Prior to the project, the following planning activities were taken up: ■ Detailed inventorisation of the angiosperm diversity in the representative area in the city (tree census) ■ GIS based tree maps for the representative area in the city ■ Pictorial handbook of the trees of the city and labeling of the trees ■ Natural Asset Map	Critical role of green public space as an essential parameter of public health has been reinforced post COVID- 19 pandemic. Improved green space that's accessible to all is pertinent. Green cover created under this project is highly relevant, as highlighted by the local stakeholders of Rajshahi during the project. Apart from the direct benefits for the local stakeholders, the opportunity to improve the biodiversity and the local climate is significant.

Project Benefits

Expanding open green cover produces various ecological, physical, economic and social benefits for the local communities. It improves the quality of air, water and soil by absorbing the pollutants. Open space helps regulate micro-climate, reduce surface run off during monsoon and heavy precipitation, thereby enhancing the value of public spaces and contributing positively to the socio-economic aspects of the community[3].

As mentioned earlier, green cover contributes to mitigating the impacts of increase in temperature and provides various ecosystem services. The enhanced green cover of the city and improved sensitisation of the local community will not just improve the biodiversity of Rajshahi City but improve the health and overall quality of life of its residents.

The Urban-LEDS II project has helped to equip the city of Rajshahi to better manage its open green spaces, achieve improved levels of awareness among the citizens on biodiversity, shared valuable information on the importance of outdoor activities, and created a platform for active public participation (in such initiatives).

Through its project actions on managing and improving green areas, Rajshahi will contribute to Aichi Targets 1, 2 and 17; and Sustainable Development Goals (SDGs): SDG 11 (Make cities inclusive, safe, resilient and sustainable), SDG 13 (Climate Action), SDG 14 (Life below water), and SDG 15 (Life on land).

Challenges

The success of any plantation programme critically depends on survival rate of the plants. The status of the plantation programme in Rajshahi was also related to the key factors of survival, and maintenance of plant species.

Md Shariful Islam, Chief Engineer, Rajshahi City Corporation

"The several interrelated activities accomplished as part of the Urban LEDS II project such as a natural asset map, tree handbook and pilot plantation work at Kolpona-Talaimari river embankment, etc. will provide much needed impetus to urban greening and biodiversity improvement actions by the city of Rajshahi."

Hence, the maintenance of established plants was considered to a crucial part of the initiative. One of the main activities of the project was to monitor the survival of the plants, watering them, and replacing dead saplings, grass patch and hedge plants.

To mitigate these challenges an expert local nursery was selected to implement and maintain the pilot-scale plantation using local and naturalised plant species. The Rajshahi City Corporation has gained the know-how on establishing and maintaining plantation through the project and have the necessary skills to upscale it to the rest of the city.

Lessons Learnt

- **Co-creation:** The problem statement was identified through a process of co-creation and the activities to deal with the issues involved stakeholders from the planning to the implementation stage. Co-creation processes helped generation of new ideas, identify and reduce potential risks and help to maintain interaction with the stakeholders.
- **Stakeholder Participation:** Formal mechanisms for local stakeholder participation or consultation in planning, formulating and implementing programmes were introduced. These mechanisms were key to the success of the project.
- **Ownership:** Participatory implementation helps in generating greater trust in the results as well as help in generating ownership of the project.
- **Sustainability:** The importance and co-benefits of public consultation and involvement has led to the sustained involvement of stakeholders in planning and implementation projects in a synergistic manner for sustainability of the project outcome.
- **Scalability and replicability:** The success of the project highlighted the scalability and replicability of the project for formulating national plans and programmes on urban greening and biodiversity.

Urban-LEDS II project: A quick snapshot

The Accelerating climate action through the promotion of Urban Low Emission Development Strategies (Urban-LEDS II) project is a global initiative being implemented in more than 60 cities in eight countries. Urban-LEDS II supports participating local governments on low emission development to reduce greenhouse gas emissions and to simultaneously enhance resilience to adapt to climate change.

The project is funded by the European Commission and implemented jointly by UN-Habitat and ICLEI –Local Governments for Sustainability. It follows on from the first phase (Urban-LEDS I) that took place from 2012 to 2015.

ICLEI South Asia is leading implementation of Urban-LEDS II in India and Bangladesh with support from UN-Habitat.

- **Project Duration:** 2017-2021
- **Model cities in Bangladesh:** Narayanganj, Rajshahi (deep-dive implementation)
- **Satellite cities in Bangladesh:** Singra, Sirajganj, Faridpur, Mongla (learning cities)
- **Model cities in India:** Nagpur, Thane (deep-dive implementation), Rajkot (knowledge-sharing)
- **Satellite cities in India:** Coimbatore, Gwalior, Panaji, Pimpri-Chinchwad, Shimla (learning cities)

References

1. Rajshahi City, Bangladesh - GHG Emission Inventory Report 2017-18, ICLEI - Local Governments for Sustainability- South Asia Secretariat, March 2021
2. Shahid, S., Wang, X. J., Harun, S. B., Shamsudin, S. B., Ismail, T., & Minhans, A. 2016. Climate variability and changes in the major cities of Bangladesh: observations, possible impacts and adaptation. Regional Environment Change 16 (2), 459-471
3. Urban Greening Guidelines 2014, Ministry of Urban Development, Government of India

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