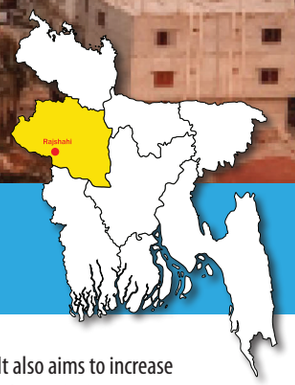
URBAN LEDS

URBAN LOW EMISSION DEVELOPMENT STRATEGIES



Climate Resilient City Action Plan – Rajshahi

Climate resilience is the ability of socioecological systems to prepare and respond to climate related events, trends, or disturbances. Improving climate resilience involves enhancing sustainability through mitigation and adaptation actions to cope and/or manage current climate risks better.

Cities inhabit 3% of the world's land but account for 60-80% of energy consumption, and 75% of global greenhouse gas (GHG) emissions. It is estimated that two-thirds of the global population will be concentrated in the urban areas by 2050. Bangladesh has one of the world's highest urban population growth rates. Climate change will have a range of effects on the expanding urban population, including resource stress due to migration from cyclone-affected areas, increased salinity from storm surges, urban drainage difficulties, vector-borne illnesses, amongst others. The urban poor are among the most vulnerable populations to the effects of climate change. Hence, it is critical for future growth of Bangladesh to develop climate-resilient and livable cities.

Bangladesh's updated NDC proposed 27.56 $MtCO_2e$ (6.73%) unconditional reduction in GHG emission from Business as Usual (BAU) scenario by 2030 and an additional 61.91 $MtCO_2e$ (15.12%) conditional reduction in GHG emission with external financial/technology support. It also aims to increase resilience to climate change and achieve lower GHG emissions.

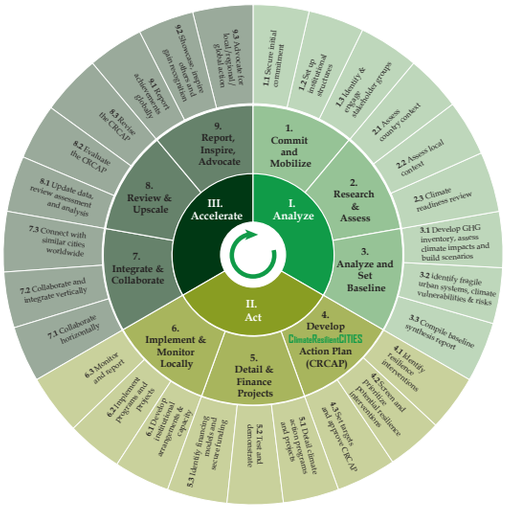


Figure 1: ClimateResilientCITIES Methodology

National and state-level initiatives such as the Mujib Climate Prosperity Plan 2021-2030 aims to supplement and accelerate the implementation. The new strategies and themes under the plan will help expedite existing development plans and programs to achieve Bangladesh's NDC of Paris climate goals to cut emissions[1].

In line with national priorities, the Urban-LEDS II project supports participating cities on low emission and climate resilient development to bring down GHG emissions and reduce vulnerability to climate change.

Methodology

The ClimateResilientCITIES methodology is an action planning process tailor made for local governments, providing step-by-step guidance for the development of a Climate Resilient City Action Plan that addresses both climate change adaptation and climate change mitigation[2]. This ClimateResilientCITIES methodology, as shown in Figure 1, is implemented in all the Urban-LEDS II model project cities in India and Bangladesh. The Climate Resilient Cities Methodology is a 9-step process in 3 phases: **Analyze, Act** and **Accelerate** - each unfolding into further steps - outlining how climate fragility can be assessed and climate resilient options explored.

Coordinates: 98°32"E-88°40"E (Long) and 24°20"N-24°24"N (Lat)

Population: 449,756 (Census 2011)

Area: 97.18 km² (37.52 sq mi)

No of Wards: 30

Electricity consumption: 213.41 Million kWh (2017-18)

Water Supply: 95 Million liters per day (2020)

Waste generation: 500 tonnes per day (2019-20)

Local Authorities: Rajshahi City Corporation (RCC),Rajshahi Development Authority (RDA) & Rajshahi Water Supply and Sewerage Authority (RWASA)

[1] Nationally Determined Contributions (NDCs) 2021, Bangladesh, Ministry of Environment and Forests, August 2021

[2] This process builds on ICLEI's Cities for Climate Protection (CCP) campaign, ICLEI's flagship mitigation program, the GreenClimateCities (GCC) program and ICLEI's adaptation toolkit, the ICLEI Asian Climate Change Resilience Network (ACCCRN) Process or IAP toolkit.

Rajshahi City Profile

Rajshahi, a metropolitan city in northwestern Bangladesh, is known for being an education hub as well as for and the famous Rajshahi silk. Rajshahi is located in the Barind Tract, 23 metres (75 feet) above sea level. It also serves as the divisional headquarters of the Rajshahi division and the administrative district of Rajshahi. It is known as one of Bangladesh's greenest cities due to its comparatively plentiful open spaces and flora.

Climate Projections:

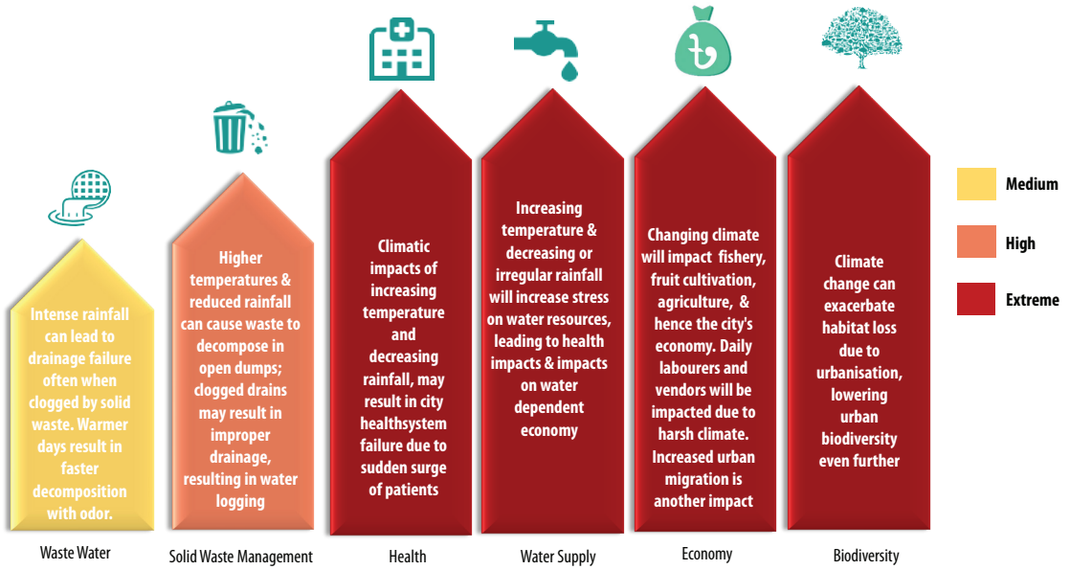
Pre-monsoon rainfall will decrease while monsoon and post-monsoon rainfall will increase in Bangladesh. Post 2051 the annual average rainfall and monsoon rainfall will follow a higher increasing trend. The mean temperatures across Bangladesh are projected to increase between 1.4°C and 2.4°C by 2050 and 2100, as compared as compared to average temperature from 1980-1999[3,4].

Climate Resilient City Action Planning for Rajshahi

The Climate Resilient City Action Plan developed by the city, through the Urban LEDS II project, has been guided by the step-by-step process of the Climate Resilient CITIES Methodology.

Vulnerability Assessment

The baseline situation analysis of the urban systems in the city has been carried out in Rajshahi. Vulnerability of each of these systems to projected climate change impacts of increase in temperature and increase in precipitation, were assessed and climate risk was analysed. Solid waste, water supply, storm water, sewerage, transportation, health, biodiversity and green spaces were identified as the vulnerable urban systems. Climate vulnerability of wards and actors were analysed for each of these urban systems. Vulnerability maps were then prepared for each fragile urban system and overlayed together to identify the vulnerability hotspots.



** Risk Score (likelihood x consequence) – Low: 1-4; Medium: 5-10; High: 11-20; Extreme: 20-25*

Figure 2 Climate Risks and Vulnerability Assessment for Rajshahi City

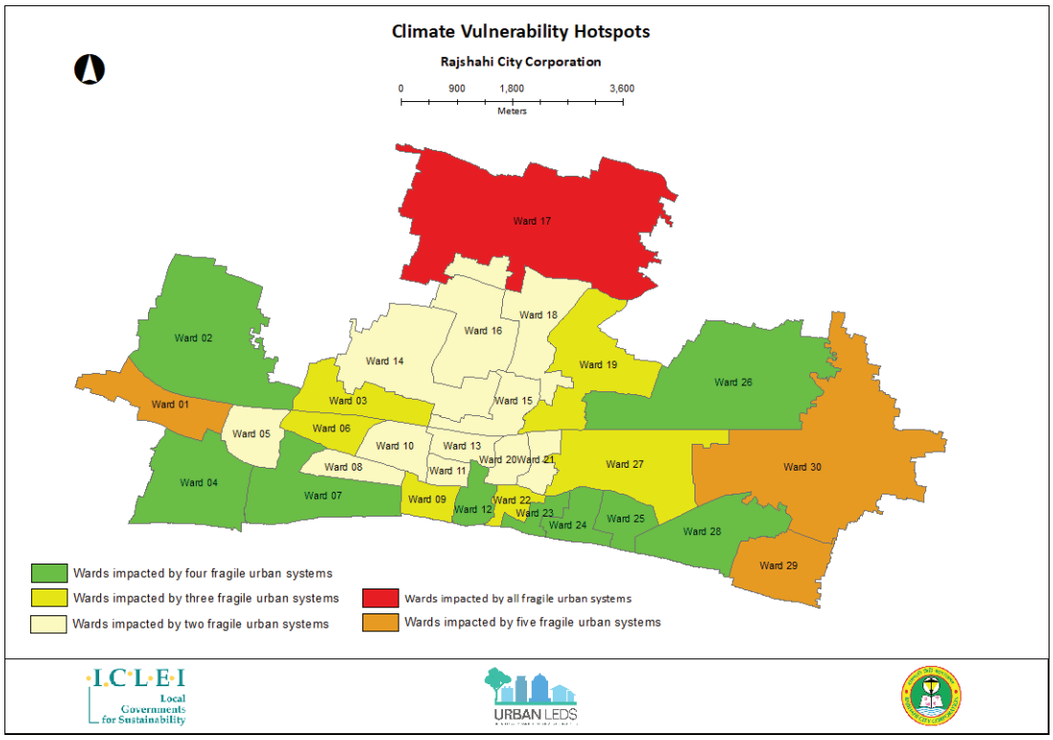


Figure 3 Vulnerable Hotspots of Rajshahi city

[3] Government of Bangladesh. "National Plan for Disaster Management, 2010 – 2015", Disaster Management Bureau Disaster Management & Relief Division, Government of Bangladesh. (2010)

[4] Dyoulgerov, Milen, A. Bucher, and F. Zermoglio. "Vulnerability, risk reduction, and adaptation to climate change: Bangladesh." Country profiles. Washington DC: The World Bank Group. (2011).

GHG Emissions Inventory

Economy-wide GHG emissions inventories for the city were developed for the years 2013-14 to 2017-18. The 2017-18 inventory indicates GHG emissions of 630,254 tonnes of CO_2e, which translates to per capita GHG emission of 1.27 tCO_2e.

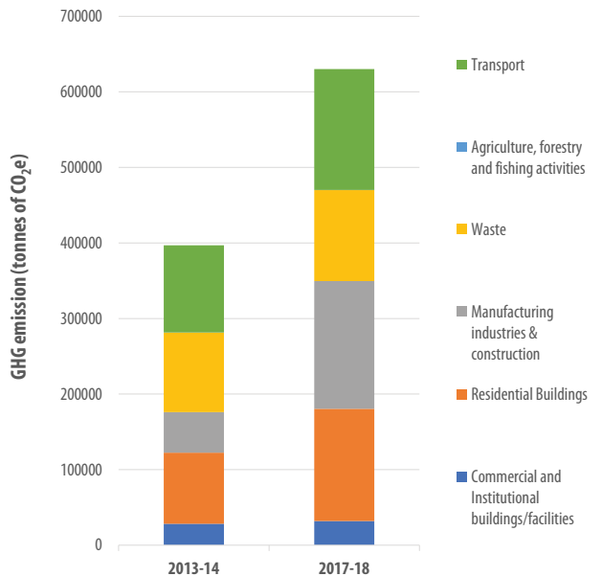


Figure 4: Trend of GHG Emissions in Rajshahi 2013-14 to 2017-18

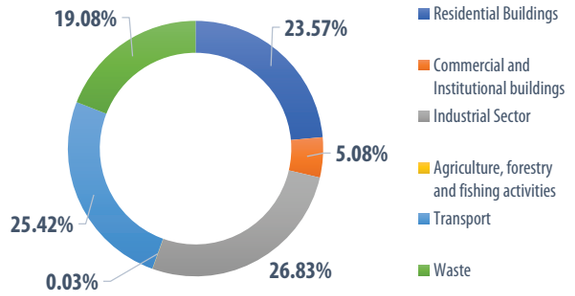


Figure 5: Sector-wise GHG Emissions in Rajshahi in 2017-18

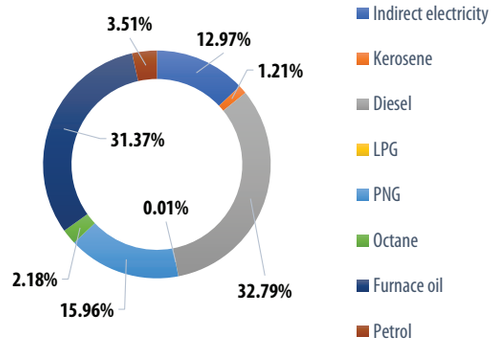


Figure 6: Sectoral Share of Energy Consumption in 2017-18

Action Plan

Sectors	Key Strategies	Mitigation Potential (tCO_2e)	Overall Climate Resilience Impact
Buildings -Residential	❖ Promote renewable energy (solar PV & SWHS) & energy efficiency retrofits (BLDC fans, energy saving lights (LEDs), refrigerators and air conditioners, etc.) ○ Pilot Green/Eco-building design	28,803	Reduced grid dependency, improved self-sufficiency from decentralized RE generation, enhanced thermal comfort & energy cost savings
Solid Waste	❖ Improved solid waste management & disposal (100 TPD composting plant & 20 TPD Biomethanation plant) ○ Integrated Solid Waste Management Plan & increasing door to door collection & waste segregation	18,816	Higher resource efficiency, lower air & land pollution and public health risks, reduced waste going to landfill, improved resilience from decentralized systems
Urban Biodiversity & Green Space	❖ Sequester carbon through increased green infrastructure (trees, plants, soil) and natural areas. ○ Develop a comprehensive Local Biodiversity Strategy & Action Plan (LBSAP), Implement a programme to promote adoption of rooftop urban farming & initiate a 'green space stewardship programme', strengthen institutional capacity to develop and maintain urban biodiversity related data and maps & identify & designate ecologically important areas as "Heritage spaces."	7,603	Green spaces as carbon sinks improve public health, reduce the heat island effect, filter storm water runoff, and provide other ecosystem services.
Buildings- Commercial and Institutional	❖ Promote renewable energy (net metered solar PV & SWHS in hospital & hotels) & energy efficiency retrofits (energy saving lights (LEDs), fans, & air conditioners, etc.) ○ Promote building energy efficiency through policy & research (mandate energy audits, develop & implement bye-law to promote & incentivise energy efficiency measures, etc.)	4,187	Reduced grid dependency, improved self-sufficiency from decentralized RE generation, enhanced thermal comfort & energy cost savings
Transport	❖ Promote use of non-motorised transport in the city through public bicycle sharing schemes (PBS) & introduce public city bus service (electric powered) ○ Adopt context sensitive street design standards & develop Comprehensive Mobility Plan (CMP) with focus on promoting low carbon transport.	370	Reduction of GHG emissions from private vehicles, improved air quality, public safety & reduced traffic congestion
Water Supply	❖ Reduce physical water losses and non-revenue water, install solar PV system to supply electricity at water plant & promote dual plumbing, grey water reuse. ○ Prepare city-level water conservation policy, develop an integrated urban water management plan & promote RWH through an incentive program.	367	Freshwater conservation, improved groundwater recharge, better water access, enhanced water availability, quality and security, reduced risk of water logging, lower public health risks

Sectors	Key Strategies	Mitigation Potential (tCO_2e)	Overall Climate Resilience Impact
Manufacturing Industries & Construction	❖ Promote renewable energy (net metered solar PV) & energy efficiency retrofits (energy saving lights & fans)	334	Reduced grid dependency, improved self-sufficiency from decentralized RE generation, enhanced thermal comfort & energy cost savings
Street Lighting	❖ Replacement of existing Street lighting with LED lights & install energy efficient Street Lighting Control & Management System (Voltage Controller & Timer) ⊙ Undertake a technical study for design of energy efficient street lighting	260	Electricity & cost savings, improved visibility; improved service quality, reliability and life of streetlights.
Waste water	❖ Pilot decentralized wastewater treatment systems (DeWATS) for households (245 KLD). ⊙ Prepare Policy and Plan for Fecal Sludge Management (FSM) & master plan to introduce centralised sewerage system. Initiate awareness generation activities on hygiene, appropriate sewage disposal alternatives, solid waste disposal	8.41	Reduced water pollution, decrease in water borne disease outbreak, reduced contamination of ground water, improved surface and groundwater quality, enhanced sanitation
Drainage	⊙ Develop a city-wide drainage master plan, promote grey water reuse & recycling for non-potable uses such as landscape irrigation, gardening, flushing & initiate public awareness activities to prevent waste dumping into drains and canals		Reduced water pollution, decrease in water borne disease outbreak, reduced contamination of ground water, improved surface and groundwater quality, enhanced sanitation
Total		60,748	

❖ Structural Strategies ⊙ Enabling Strategies

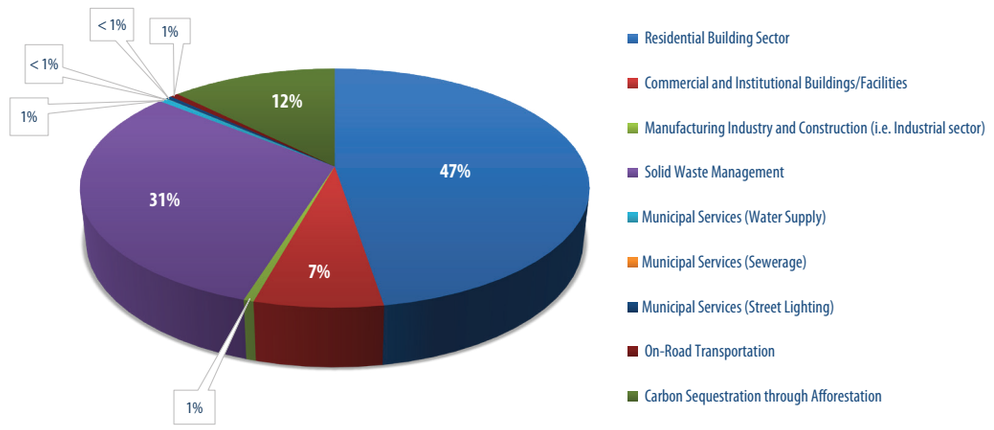


Figure 7: Total Annual Mitigation Potential of CRCAP-Rajshahi

The Climate Resilient City Action Plan (2022-26) proposes actions with an annual GHG emission mitigation potential of approximately 10% by 2026-27 over the 2017-18 baseline.

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 and climate resilient development to reduce greenhouse gas emissions and to adapt to climate change.

Project Duration: 2017-2021

Model cities in Bangladesh: Narayanganj, Rajshahi (deep-dive implementation)

Satellite cities in Bangladesh: Singra, Sirajganj, Faridpur, Mongla (learning cities)

To know more, please visit www.urban-leds.org

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

Supported by

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