URBAN LEDS

URBAN LOW EMISSION DEVELOPMENT STRATEGIES

Climate Resilient City Action Plan – Narayanganj

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.

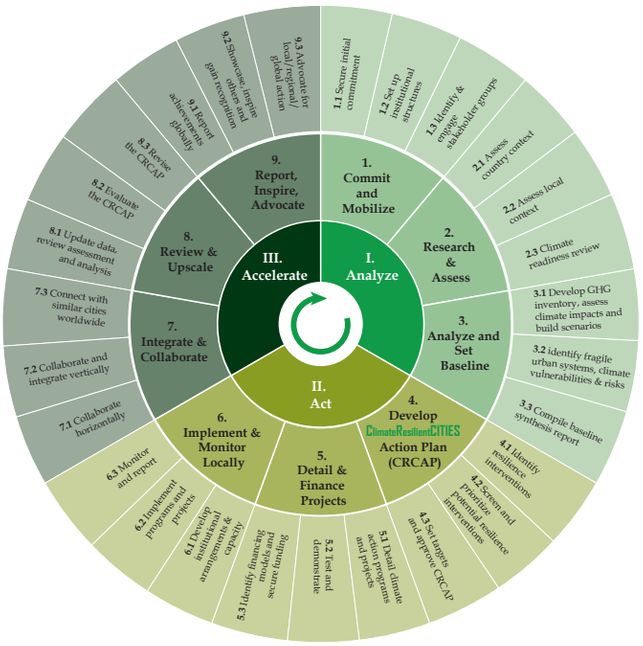


Figure 1: ClimateResilientCITIES Methodology

Bangladesh's updated Nationally Determined Contribution (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[1]. It also aims to increase resilience to climate change and achieve lower GHG emissions.

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.

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.

Coordinates: 90°26"E-90°45" E (Long) and 23°33 "N-23°57" N (Lat)
Population: 709,336 (Census 2011)
Area: 72.43 km^2 (27.96 sq. mi.)
No of Wards: 27
Electricity consumption: 951 Million kWh (2018-19)
Water Supply: 92.2 Million liters per day (2018-19)
Waste generation: 400 tonnes per day (2018-19)
Local Authorities: Narayanganj City Corporation, Rajdhani Unnayan Kartripakkha (RAJUK)

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

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.

Narayanganj City Profile

Narayanganj is a city, located approximately 30 km southeast from the national capital of Dhaka. Narayanganj is a fast-urbanizing city, located on the banks at the confluence of the River Shitalakshya and the River Buriganga. It is an industrial center famous for its jute mills and textiles and a prominent river port. Given its proximity to Dhaka, Narayanganj is a key contributor and driver of the regional economy and employment. Most industrial units are located on both banks of River Shitalakshya and eastern bank of River Buriganga River and provide several employment opportunities in the city.

Climate Resilient City Action Planning for Narayanganj

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

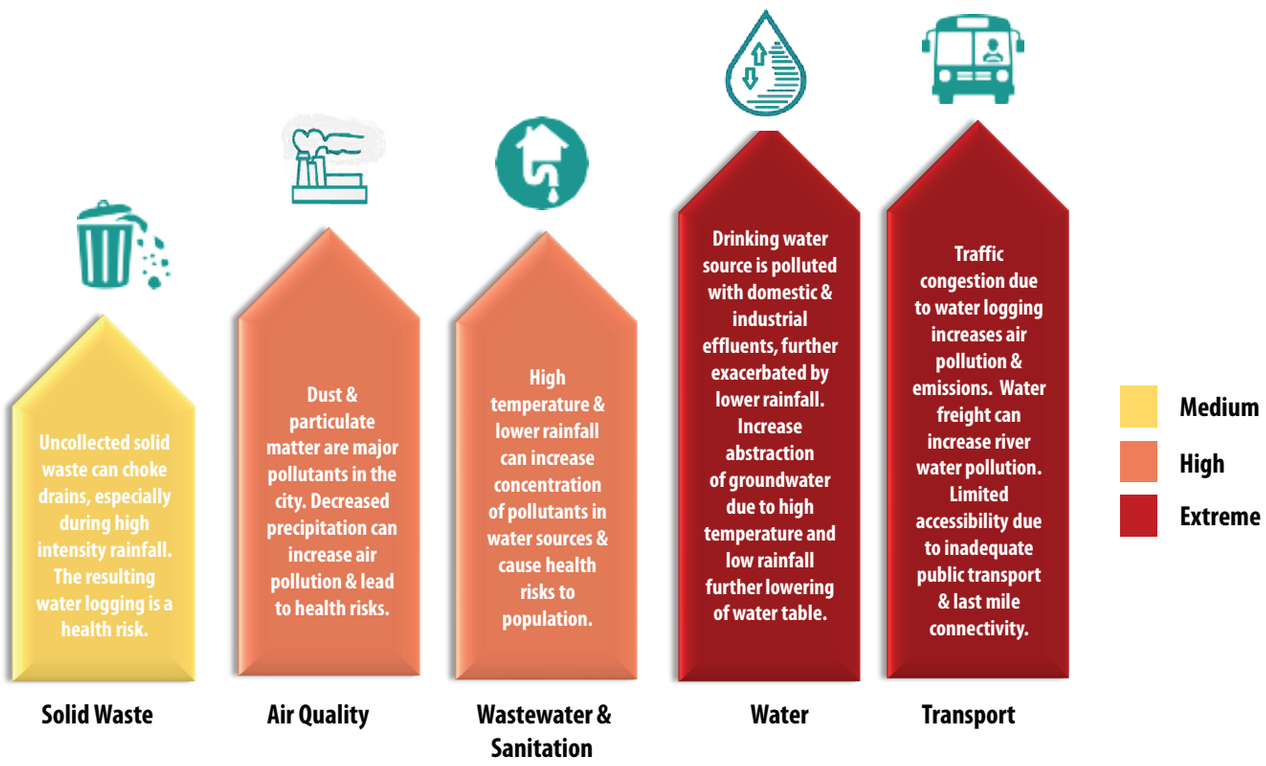
The baseline situation analysis of the urban systems in the city has been carried out in Narayanganj. Vulnerability of each of these systems to projected climate change impacts of increase in temperature and changes in precipitation, were assessed and climate risk was analysed. Air quality, Water, Wastewater and Sanitation, Solid Waste, and Transport 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.

GHG Emissions Inventory

Economy-wide GHG emissions inventories for the city were developed for the years 2014-15 to 2018-19. The 2018-19 inventory indicates GHG emissions of 1,061,409 tonnes of CO_2e, which translates to per capita GHG emission of 1.19 tCO_2e.

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 to average temperature from 1980-1999[3,4]. In Narayanganj, monthly minimum temperature is predicted to increase up to 6.8°C and the minimum winter temperature up to 13°C in the next 100 years. No significant change of trend in rainfall was noted between 1980-2013 in the city.



* 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 Narayanganj City

[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.

[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).

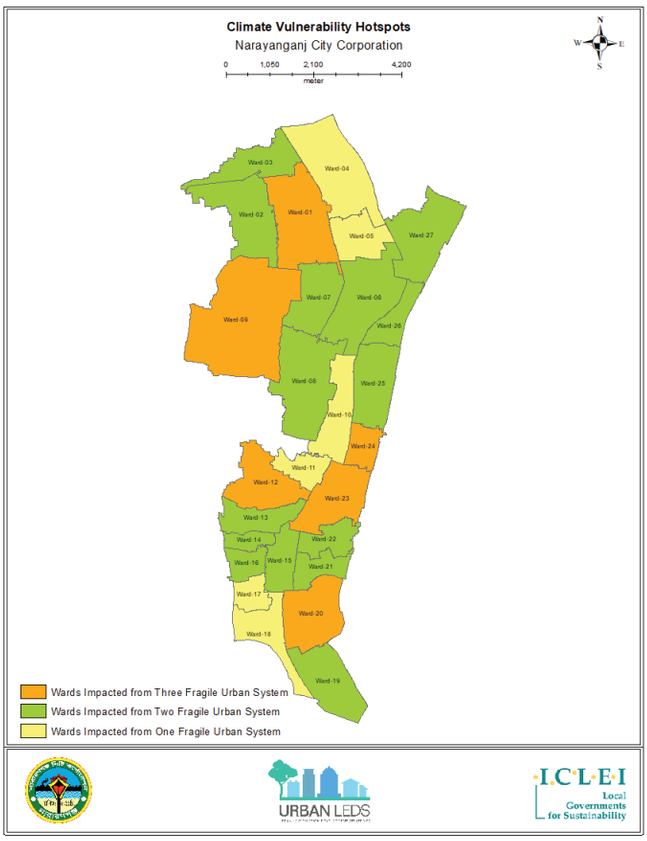


Figure 3 Vulnerable Hotspots for Narayanganj city

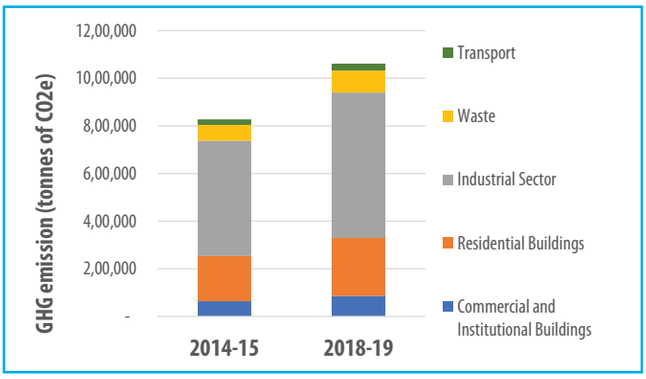


Figure 4: Trend of GHG Emissions in Narayanganj 2014-15 versus 2018-19

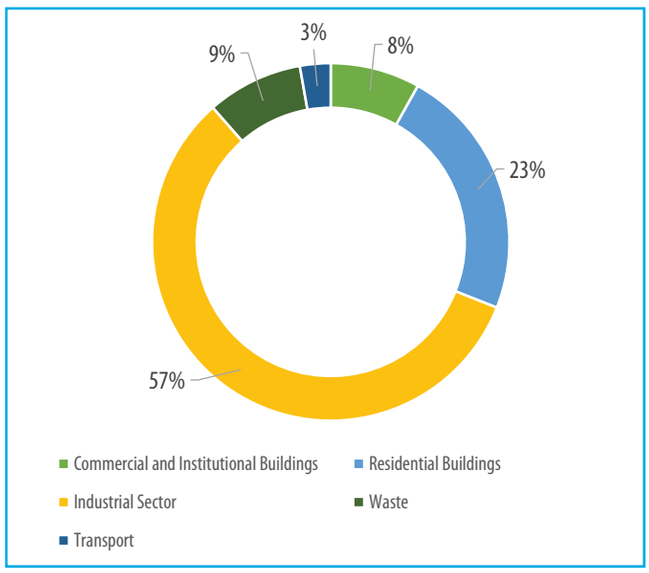


Figure 5: Sector-wise GHG Emission in Narayanganj in 2018-19

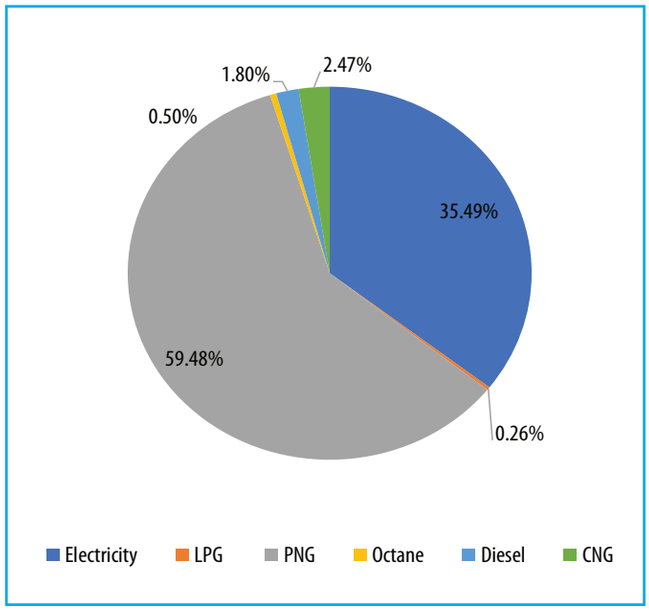


Figure 6: Sectoral Share of Energy Consumption in 2018-19

Action Plan

Sectors	Key Strategies	Mitigation Potential (tCO_2e)	Overall Climate Resilience Impact
Solid Waste	❖ Implement waste to energy plant of 500 TPD ○ Strengthen implementation of 3R Strategy	81,652	Higher resource efficiency, lower air & land pollution, & public health risks, reduced waste to landfill
Residential Buildings	❖ Promote renewable energy (RE) (net-metered Solar PV & Solar water heating systems) & energy efficiency (EE) adoption (efficient ceiling fans, LED lights, air conditioners) ○ Pilot Green/Eco-building design, programme for rooftop gardening adoption	44,233	Reduced grid dependency, efficient thermal comfort & energy cost savings, heat mitigation, urban food security
Commercial and Institutional Buildings	❖ Scale-up RE adoption (net metered Solar PV & SWHS in hospital, hotels & institutions), EE adoption (LED lights, efficient fans and air conditioners) ○ Policy mandates and incentives for RE & EE in buildings, inefficient appliance exchange programs	3,821	Reduced grid dependency, efficient thermal comfort & energy cost savings
Industries	❖ EE adoption (LED lights, efficient ceiling fans), scale-up Solar PV adoption	2,098	Reduced grid dependency, energy & cost savings
Transport	❖ Promote and develop non-motorized transit facilities, introduce public transport through city bus ○ Undertake Comprehensive Traffic Study and prepare Low Carbon Transport Plan	1,434	Reduced traffic congestion & GHG emission, improved air quality, better mobility and accessibility

Sectors	Key Strategies	Mitigation Potential (tCO_2e)	Overall Climate Resilience Impact
Water Supply	❖ Reduce physical water losses and non-revenue water, install Solar PV system, promote rainwater harvesting ⭘ Prepare city-level water conservation policy, introduce integrated water resource management, study and incentives to promote rainwater harvesting	94	Freshwater conservation, improved groundwater recharge, enhanced water availability, quality and security, reduced water logging & public health risks
Street Lighting	❖ Install smart and efficient street lighting control systems ⭘ Technical study and energy audit for street lighting design	15	Energy & cost savings, improved visibility; improved reliability; longer life of infrastructure
Waste water and Drainage	❖ Pilot decentralized wastewater treatment systems (DeWATS) for households (250 kLD), promote and adopt non-potable reuse & recycling of grey water ⭘ Drainage master plan, Policy and Plan for feacal sludge management, effective monitoring and auditing of industrial wastewater, centralized sewer system master plan, optimum operation of new sewage treatment plants	0.03	Improved water quality, enhanced sanitation, lower public health risks, improved resilience to high intensity rainfall, revival of local biodiversity
Urban Biodiversity & Air Quality	❖ Improve and maintain urban green cover and green spaces, restoration of surface water bodies and biodiversity conservation ⭘ Promote nature-based solutions for flood control, utilize air quality data for sustainable urban planning	-	Ecology and biodiversity conservation, urban heat mitigation, cleaner air and water, urban flood mitigation
Total		133,346	

❖ Structural Strategies

⭘ Enabling Strategies

The Climate Resilient City Action Plan (2022-27) proposes actions with an annual GHG emission mitigation potential of 12.6% by 2026-27 over the 2018-2019 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.

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)

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

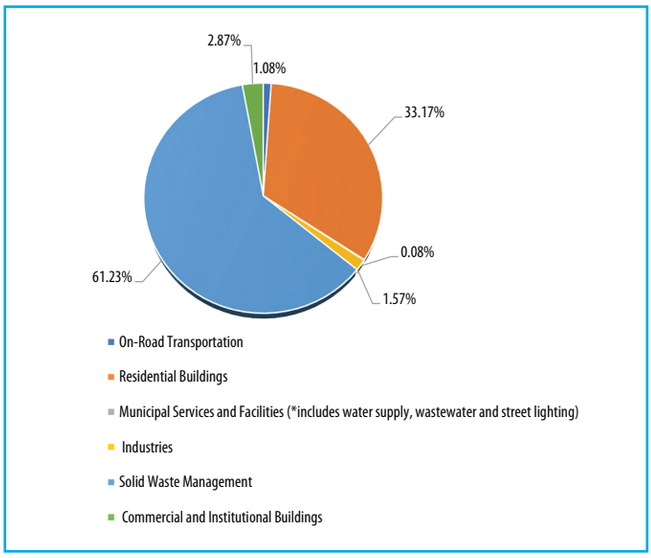


Figure 7: Sectoral Share of Mitigation Potential of CRCAP-Narayanganj

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