

ClimateResilientCITIES Action Plan - Siliguri

Climate resilience refers to the capacity of socio-ecological systems to maintain function in the face of climate change stresses and enhance sustainability through mitigation and adaptation actions. Cities consume over two-thirds of the world's energy and account for more than 70% of global CO₂ emissions. With cities projected to house over 60 % of the global population by 2030, the carbon footprint of cities is only going to increase. Planning for urban resilience should reconsider carbon intensive activities and propose not only mitigation actions that reduce emission sources but also those that help the city to adapt to the challenges of climate change, such as sea level rise, temperature changes, precipitation changes or extreme events.

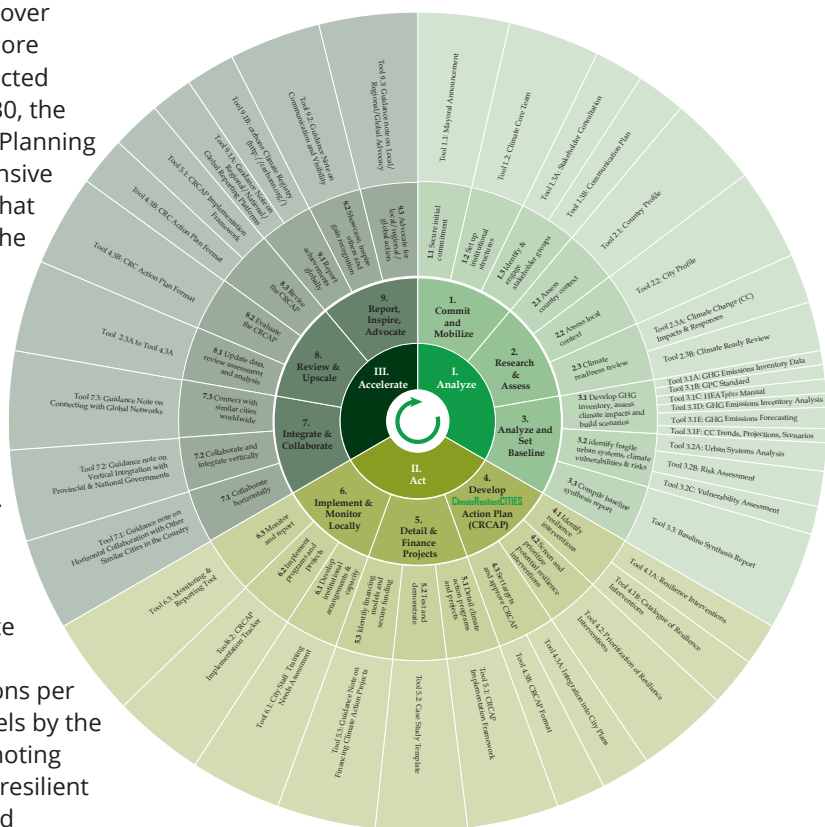
India is a rapidly urbanizing country. Urban India accounted for 11.4% of the country's population in 1901. This has increased to 28.53% in 2001 and exceeded 30% in 2011, standing at 31.16% in 2018. The Indian national government is committed to Greenhouse Gas (GHG) emissions reduction and ensuring sustainable urban development. Subsequent to the Conference of Parties on Climate Change (COP 23) at Paris, India has determined to reduce its GHG emissions intensity — GHG emissions per unit of GDP — by 33 to 35 per cent below 2005 levels by the year 2030. Deployment of renewable energy, promoting clean energy, enhancing energy efficiency, climate resilient urban development, sustainable transportation and increasing forest cover to create additional carbon sinks are some of the proposed actions.

In line with national priorities, the CapaCITIES project also aims to strengthen the capacities of Indian cities to identify, plan and implement measures for reducing GHG emissions and for enhancing resilience to climate change in an integrated manner.

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. 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. This ClimateResilientCITIES methodology, shown below, is implemented in all the four project cities.



ClimateResilientCITIES Methodology

The City of Siliguri

Siliguri is strategically located in the area known as Chicken Neck Corridor, an important link connecting the states in North East India and the neighbouring countries with rest of India. It is the second most important city of West Bengal, after Kolkata, and hence, is the second administrative capital of the State. The city is popular as a transport and tourism transit hub, for its tea industry, and the UNESCO World Heritage Centre Darjeeling Himalayan Railway (better known as Toy Train of Darjeeling).

Population:	513,264 (Census of India, 2011)
Area:	41.9 sq. km.
No of Wards:	47 wards
Gender Ratio:	946/1000 males
Literacy rate:	77%

Climate Resilient City Action Plan for Siliguri















The Climate Resilient City Action plan has been developed for the city, through the CapaCITIES project. It includes both mitigation and adaptation measures

Vulnerability Assessment



The baseline situation analysis of the urban systems in the city has been carried out in Siliguri. Vulnerability of each of these systems, with respect to climate change impacts of increase of temperature and increase of short duration high intensity precipitation, were assessed and climate risk was analysed. All the urban systems of Siliguri, viz, water supply, solid waste management, transportation, drainage and sewerage were identified as vulnerable urban systems. Vulnerability of wards and actors was analysed for each of these urban systems. Vulnerability maps were then prepared and overlaid together to identify the vulnerability hotspots.

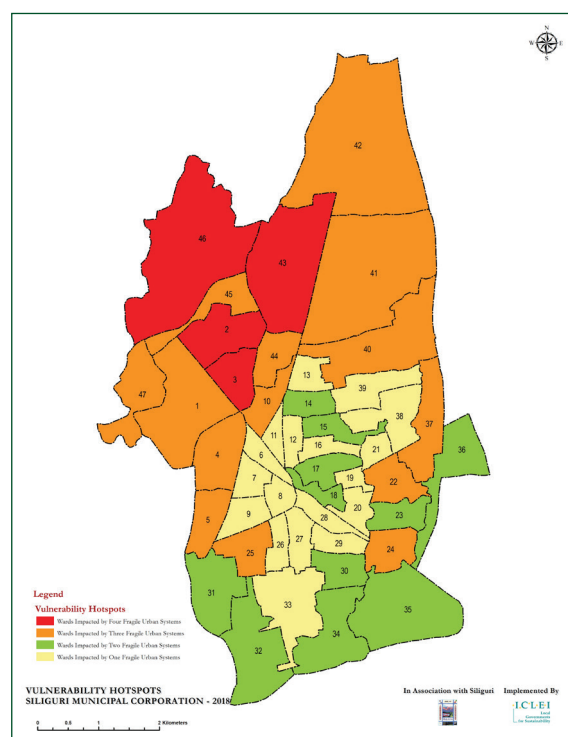
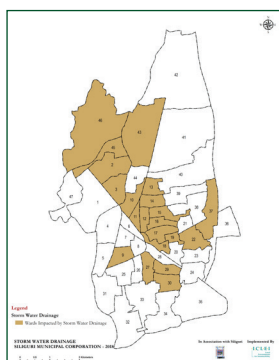
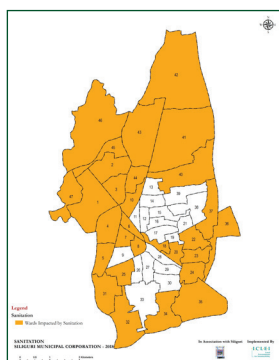
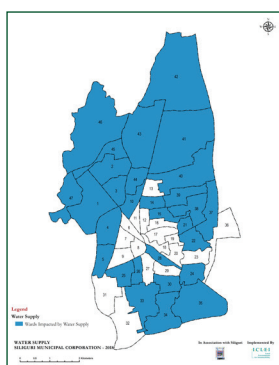
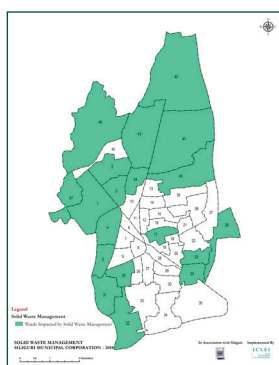
Climate Projections: Siliguri will witness an increase in unseasonal rain during the winters, with an overall increase of short duration high intensity rainfall. The average temperatures along with daily maximum and daily minimum temperatures of the city are expected to increase.

Climate risk and vulnerability assessment of fragile urban systems in Siliguri

Fragile Urban Systems	Climate Risks	Climate Fragility Statements	Risk*
 (Water Supply)		• Increased demand for water will pose additional stress on the supply system	High
		• Increased chances of groundwater pollution	Medium
 (Sanitation and Sewerage)		• Increased chances of greater 'knock-on' impacts on health	High
		• Overflow of sewage lines and dilution of waste water will impact efficient of waste water treatment	High
 (Storm Water Drainage)		• Increased chances of greater 'knock-on' impacts on health due to contamination of potable water during flood events	High
 (Solid Waste Management)		• Increased rate of waste decomposition in open dumps creating health hazards	High
		• Increased instances of water logging and impacts on health due to choking of drains	Extreme
 (Transport)		• Increased use of private vehicles may lead to more traffic congestion and increased GHG emissions	Extreme
		• Increased road maintenance cost and increase in traffic congestion due to damage to roads	Extreme

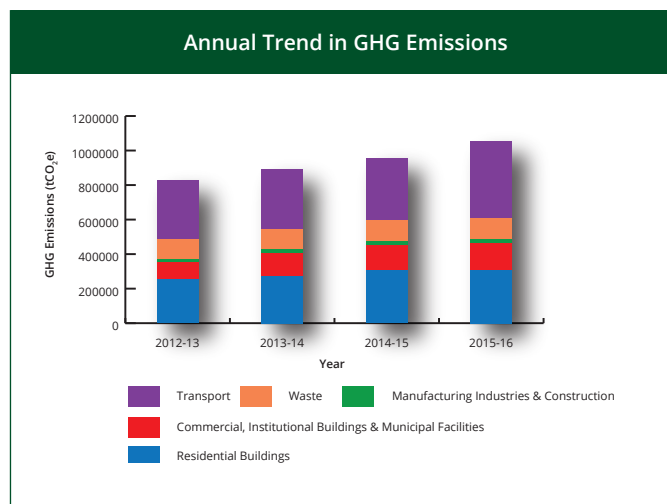
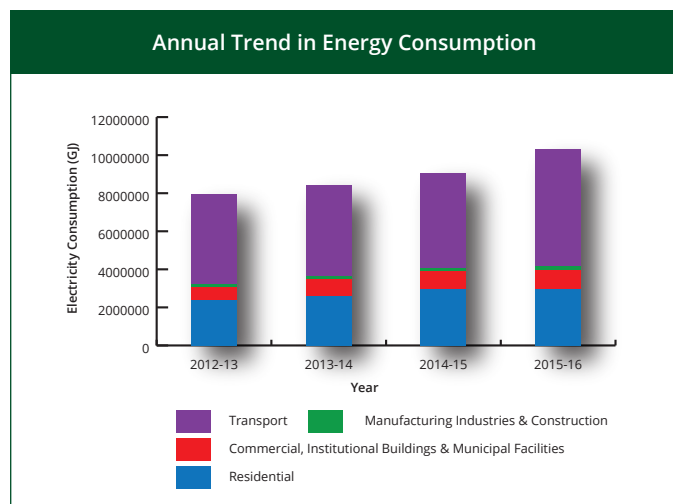
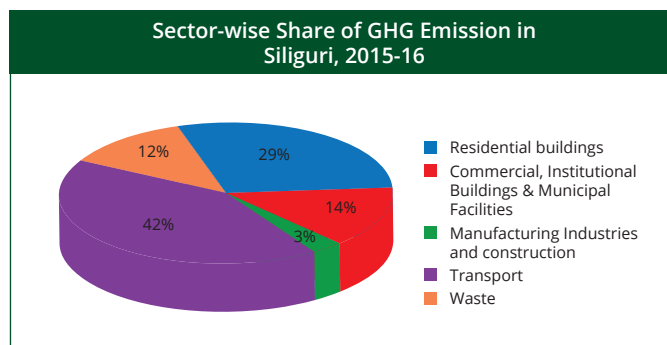
* Risk Score (likelihood x consequence) – Low: 1-4; Medium: 5-10; High: 11-20; Extreme: 20-25

 temperature increase;  rainfall increase



GHG Emissions Inventory

The GHG emissions inventory for the city has also been developed. The inventory for 2015-16 shows that the total GHG emission for Siliguri amounted to 1.06 million tonnes of carbon dioxide equivalent (tCO₂e), which translates to an average per capita GHG emission of 1.88 tCO₂e. This is higher than the average per capita GHG emission for India in 2010 of 1.56 tCO₂e.



Action Plan

A basket of climate adaptation and mitigation actions has been detailed in the Climate Resilient City Action Plan of Siliguri. While the CapaCITIES project focuses on the sectors of water, transport, sanitation and sewerage, buildings and solid waste, the Climate Resilient City/Action Plan addresses economy wide sectors. A snapshot of the Climate Resilient City Action Plan is illustrated below.

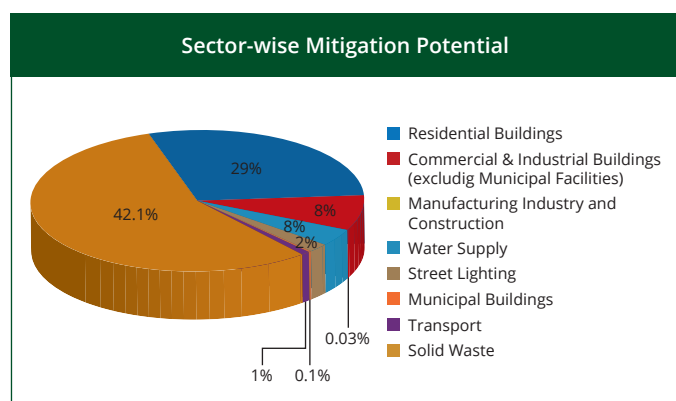
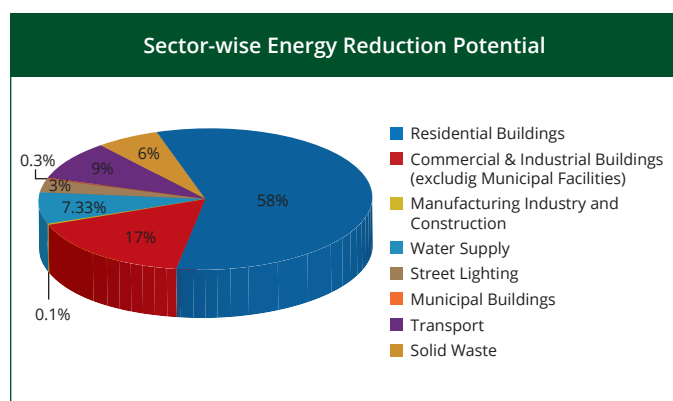
Sector	Example of Resilience Interventions	Total Mitigation Potential (tCO ₂ e)	Overall Resilience Impact
Buildings	Solar PV systems Energy efficient fixtures Tax incentives Green building designs	57261.75 (37% of total)	Reduction of GHG emissions, improvement in ambient micro climate conditions, and increase in social adaptive capacity through promotion of climate actions
• Residential		44218.32	
• Commercial and Institutional		12850.03	
• Municipal Corporation		193.40	
Water Supply	Reduction in proportion of non-revenue water from 78% to 20% Installation of captive Solar PV plants at Jhankar, Shaktigarh, and Pareshnagar I water pumping stations and Intake point through RESCO mode	5633.45 (4% of total)	Improved water resource management, reduced water scarcity, better health and lower GHG emission. Reduction in NRW will ensure water savings which can be used to serve to additional consumers in the city or provide more water to the existing consumers.
Street lights	Replacement of existing street lighting with LED lamps through ESCO Solar PV Systems	2376.21 (2% of total)	Reduced GHG emissions with better visibility and improved safety



Sector	Example of Resilience Interventions	Total Mitigation Potential (tCO ₂ e)	Overall Resilience Impact
Transport	Introduction of 30 electric buses to replacement diesel operated city buses Measures for providing infrastructure for traffic de-congestion	2108.44 (1% of total)	Reduction of GHG emissions from public and private vehicles, improved air quality, and reduced traffic congestion
Solid Waste Management	Scaling up Sunya to whole Siliguri Improved waste processing at end point – composting, recycling, RDF pelletisation etc Policy mandates	86472.49 (56% of total)	All waste generated within city will be treated which will reduce the GHG emissions and improve socioeconomic co-benefits through improved health and livelihood of vulnerable sections.
Total		154173.99	

The Climate Resilient City Action Plan (2018-2023) for Siliguri proposes actions with an annual GHG emission mitigation potential of 14.6% by 2022-23, over the 2015-16 (financial year) baseline.

Sector-wise Mitigation Impact



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