

## Siliguri: Building strategies for a sustainable city

**S**iliguri is the third largest urban agglomeration in the state of West Bengal, India. It is strategically located on the banks of the Mahananda River at the foothills of the Eastern Himalayas. The city is in the Darjiling district but the municipality has some of its wards in another district of West Bengal—Jalpaiguri. The city serves as an important link connecting mainland India with its northeastern states, and neighbouring countries. The settlement of Siliguri developed as a tea plantation and trading center, but due to tremendous growth, it has now become one of the fastest growing cities of the State. According to the 2011 Census, the geographical area under municipality is about 49 sq km with a population of 513,264. However, Siliguri Urban Area, which includes adjacent urban areas along with municipal area, is about 117 sq km. With rapidly growing urban population, the city, with support from partner organisations, have initiated some focused strategic interventions to ensure sustainable and climate-resilient development.

### *A roadmap to build a liveable city*

Cities consume about two-third of the world's energy. It accounts for more than 70 % of global CO<sub>2</sub> emissions. By 2030, it is projected that over 60% of global population will live in cities. Carbon footprint of cities is bound to go up. Situated at a sensitive geo-political and environmental zone, Siliguri realised the need for building climate-resilient city hence it started reconsidering carbon-intensive activities and shifted focus on actions on mitigation to reduce emission. Planning for urban resilience will help the city to face the challenges of climate change.

A Climate Resilient City Action Plan (CRCAP) was developed for the city of Siliguri through the Swiss Agency for Development and Cooperation (SDC) supported CapaCITIES project on September 14, 2018, after deliberation in stakeholder consultations. A council meeting was held to table the plan and it received a positive response. The plan was then presented at the Board Meeting of Siliguri Municipal Corporation and was unanimously adopted. Siliguri thus became the first city in the country to adopt the CRCAP.

### *Climate Resilient City Action Plan (CRCAP)*

The climate resilient city action was developed to face climate change stresses and enhance sustainability through mitigation and adaptation actions. A baseline analysis was carried out to check the vulnerability of the urban systems. Concerning the climate change impacts in each of these systems, the increase of short-duration high-intensity precipitation and increase in temperature were assessed and climate risk was studied. It was also found that Siliguri will witness an increase in unseasonal rain during the winters. An overall increase in short-duration high-intensity rainfall has also been predicted. Also, it was found that the average temperatures along with daily maximum and daily minimum temperatures are expected to increase.

The urban systems of Siliguri were identified as vulnerable urban systems, including drainage, sewerage, water supply, and transportation. Some of the sectors with their total mitigation potential, resilience interventions, and overall resilience impact have been listed below:

Sector	Total Mitigation Potential (tonnes of Carbon dioxide equivalent)	Resilience interventions	Overall Resilience impact
<ul style="list-style-type: none"> <li>• Buildings</li> <li>• Residential</li> <li>• Commercial and institutional</li> <li>• Municipal Corporation</li> </ul>	<p>57261.75 (37% of total)</p> <p>44218.32</p> <p>12850.03</p> <p>193.40</p>	<p>Solar PV systems</p> <p>Energy efficient fixtures</p> <p>Tax incentives</p> <p>Green building designs</p>	<p>Improvement in ambient micro-climate conditions, reduction of GHG emissions, and increase in social adaptive capacity through the promotion of climate actions</p>
Water supply	5633.45 (4% of total)	<p>Installation of captive Solar PV plants, water pumping stations, and intake point through RESCO mode</p> <p>Reduction in the proportion of non-revenue water from 78% to 20%</p>	<p>Improved water resource management, reduced water scarcity, better health and lower GHG emission.</p> <p>Reduction in NRW will ensure water savings which can be used for additional consumers in the city or provide more water to the existing consumers.</p>
Transport	2108.44 (1% of total)	<p>Introduction of 30 electric buses to replace diesel-operated city buses</p> <p>Measures for providing infrastructure for traffic decongestion</p>	<p>Improved air quality, reduction of GHG emissions from public and private vehicles, and reduced traffic congestion.</p>
Solid Waste Management	86472.49(56% of total)	<p>Scaling up SUNYA</p> <p>Improved waste processing at end point-composting, recycling, RDF pelletization, etc.</p>	<p>All waste generated within the city will be treated, reducing GHG emissions and improving socioeconomic co-benefits through improved health and livelihood of vulnerable sections.</p>

Street lights	2376.21 (2% of total)	Replacement of street lighting with LED lamps through ESCO  Solar PV Systems	Reduced GHG emissions with improved safety and better visibility.
Total	154173.99		

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

#### *Sunya initiative*

The city generates more than 350 tonnes of solid waste per day. The usual household, commercial and institutional collection is carried out through tricycles. They are then transported in secondary storage—community bins. These bins are then taken away by mechanised vehicles to an open dump site, within the city boundary. However, at-source waste segregation is not practiced. Given the presence of a large number of tea gardens, the demand for compost is significant around the city.

Siliguri Municipal Corporation has a 100-ton-per-day manual and aerobic composting facility. The dump site is fast reaching its capacity and soon will be saturated within the next decade. A lot of work needs to be done at the central processing and treatment level for the system, decentralized systems incorporating the principles of Reduce, Reuse, and Recycle can support the system to a large extent. To ensure that only a minimal amount of waste reaches the dumpsite, the SUNYA initiative was, thus, conceptualised.

With a specific focus on the reduction of GHG emissions from waste disposal, the initiative aims to support the city in its larger objective of sustainable waste management. After preliminary discussions and reconnaissance surveys with stakeholders, regarding the existing waste management practices, a characterization and quantification study was carried out to assess the composition of the waste and the quantity of waste being generated. Various Information, Education, and Communication (IEC) activities were conducted to generate awareness among the citizens about waste segregation and its benefits. Changes were made like providing two dustbins to all the beneficiaries for segregating their waste into wet and dry waste. Bins for the segregated waste collection were placed in the tricycles. All the secondary storage community bins in the wards were segregated into wet and dry bins.

Receiving positive results in a GHG emission mitigation impact of 86,742 tonnes of Carbon dioxide equivalent (tCO<sub>2</sub>e), the project has good potential for scaling up and can be implemented in all the wards of the city. Finances for scaling up can be mobilized under various National and State level programmes such as Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Swachh Bharat Mission of central government, and Nirmal Bangla and Green Cities Mission of the state governments.

As the gateway to the northeastern region of India, it has been an important junction and a city with much potential for sustainable growth. What is required is more initiatives, stringent administration control, and policies to protect the city from drastic climate change, and maintain the minimum environmental balance to make the place more productive in environmental aspects. Learning from

the experiments in reduction in GHG emission, the projects and programs can be scaled up for greater environmental benefits.