Case Study: Thiruvananthapuram

Thiruvananthapuram city

The capital city of Kerala, Thiruvananthapuram city is located on the western coastal Plains along the Arabian Sea. Thiruvananthapuram, also known as Trivandrum is spread across an area of 214.86 Sq. Km, making it the largest city in the southern region of India. The city is situated along the banks of the Killi and Karamana rivers and is also home to the backwaters of Vellayani, Thiruvallam, and Aakulam.

This green city is in connection with various water bodies, hence is environmentally sensitive and prone to impacts of the Climate Change. Erratic rainfall patterns and rising sea levels lead to flooding, soil erosion, vulnerability to coastal storms, degradation of surface and groundwater sources, landslides, and seasonal droughts. These Climate Change impacts are presumably due to the consolidated effects of land-use change, geography, urbanisation, population growth, and all sorts of development activities. The detrimental effects may vary from erratic rainfalls affecting farming and daily activities of residents to disasters harshly affecting the entire settlement.

Thiruvananthapuram Corporation has taken the following initiatives that deal with the impacts of Climate Change:

1) **The conversion of street light to LED street lighting systems**
   According to data given by the engineering division of the municipal body, the city corporation has replaced up to 60% of the city's street lights with LED lights. Since LED lights are about 80% more effective than traditional lighting and have an extended lifespan, greenhouse gas emissions are considerably lowered with this switch to LED lights.

2) **Use of Solar panels in Government and public sector buildings**
   The state government has selected Thiruvananthapuram to be developed as a solar /renewable energy (RE) city as part of the Central government's initiative for the expansion of renewable energy through implementing the concept. The state government has envisaged the adoption of solar/RE city as part of its efforts to enhance energy security and mitigate climate change risk.

3) **Shift to use of Electric Vehicles**
   The Thiruvananthapuram Corporation is taking steps to shift city transportation towards the use of Electric vehicles to reduce GHG Emissions. Efforts to popularise Electric vehicles and set up of charging stations are being focused upon to decrease the percentage of carbon emissions by vehicles in the city atmosphere.

4) **Actions on household waste burning**
   Thiruvananthapuram Corporation has worked on waste management plans which include strict guidelines for the burning of waste that pollutes the air and dumping waste causing litter on city grounds alongside water pollution. The corporation has

taken initiatives of scientifically handling waste, from collection to disposal, and charging fines for the burning of waste in open areas.

Thiruvananthapuram Corporation's interventions in the prevention of marine plastic litter pollution consist of two projects – The Plastic Fischer Project and The Clearbot Project.

5) The Plastic Fischer Project

The Plastic Fischer Project is an end-to-end Service starting from Building, then deploying, Collecting, Sorting, Preparing, and the final step of Processing. A total of 10 systems at different locations in Thiruvananthapuram have collected 63.313 tonnes of plastic waste as shown in the following Photographs:

Photograph 1: Before and After Photographs
Source: Plastic, non-biodegradable waste management – Swachh Bharat (Grameen)

Photograph 2: Before and After of Plastic Waste Collected at a Nalah
Source: Plastic, non-biodegradable waste management – Swachh Bharat (Grameen)

The Plastic waste floating in the water bodies not only causes water pollution but also serves as grounds for disease-breeding insects. Cleaning the floating waste drastically improves the environment.

6) **The Clearbot Project**

The project is being planned for Veli Lake, which is a popular tourist site and approximately 10 kilometers from Trivandrum city. During the monsoon, it mixes with the Arabian Sea at one end and is connected to Akkulam Lake at the other. During the monsoon, all of the trash that has clogged Veli Lake is dumped into the sea. Veli Lake is an excellent location to install Clearbot, according to our preliminary research and site observation. The Material Recovery Facility will safely manage and treat the waste that has been gathered from the lake.

Photograph 3: Cleaning floating Trash at Trivandrum water Body
Source: Plastic, non-biodegradable waste management – Swachh Bharat (Grameen)

The system at Thampanoor Thodu hired an excavator for waste collected at the drain. Approximately 10 tonnes of waste were removed from the drain. The collected waste was moved for drying operations to Putharikandam Maithanam. The recovery of Plastic from the collected waste is ongoing and approximately six tonnes of plastic has already been recovered.

Conclusion

Focus is placed on the sectors of Energy and Waste management to combat the greenhouse gas emissions within the city of Thiruvananthapuram. Energy sector initiatives such as the conversion of street lights to an LED lighting system, the use of Solar panels for electricity, and the promotion of the use of electric vehicles, directly or indirectly cater to the GHG emission while waste management caters to environmental degradation caused by burning of waste in open spaces and increasing water pollution. Identifying leading causes and taking initiatives to tackle the impacts of Climate change is the need of the hour, which Thiruvananthapuram Corporation is actively partaking in.