

## Case Study

### Thimphu City, Bhutan: Initiatives to reduce Climate Change Impacts

Thimphu City is the capital as well as the largest city in the country of Bhutan. The Thimphu River, also known as the Raidk River, flows through the narrow, linear valley where Thimphu is located. According to height, Thimphu is the fifth-highest capital in the world, with a range of 2,248 meters (7,375 feet) to 2,648 meters (8,688 feet). Bhutan's political and economic capital, Thimphu, has a strong agricultural and livestock industry that accounts for 45% of the nation's gross national product. Even though it contributes to the economy, tourism is closely regulated in order to preserve a balance between tradition, advancement, and modernization. Being the kingdom's fast-developing capital, it is also the most vulnerable to Climate change.

Over the years several initiatives have been taken to bring down the impacts of Climate Change in Thimphu City. Five of these initiatives are discussed below.

#### **1. Waste Drop-off Centers (DOCs)**

The Drop-off Centers (DOCs) are temporary storage facilities that store segregated wastes in separate compartments - wet, dry, household hazardous and others. The DOCs are a convenient solution for citizens who are not able to meet the regular waste collection schedule and encourage the public to be mindful for their waste by not engaging in illegal dumping and littering of waste. Nine DOCs were constructed across the city in Chubogang, Tshalumaphey, Bebena, Lungtenphu, Changbangdu, Changzamtog, Mothithang, Jungshina and Dangrina. The Adjacent Photograph is of one of these DOCs.

Several awareness programs were also held for the public in all the DOCs as well as with over 350 participants from the various institutions by the Thromde Thuemi's (people's representatives) and the City Environment Division.



*Photograph 1: Waste Drop-off Center (DOC) Picture*

A waste mobile application has also been developed called TT Waste App. With this App, people no longer have to wonder when the garbage truck will arrive; they can track the garbage trucks in real-time and also check the waste collection schedule for their locality. The App also has detailed information on the Drop-off Centers, how to segregate waste at home and also has space for you to leave feedback or complaints.



Photograph 2: The mobile application for Waste collection

## 2. Home Composting

The area available for household gardens is small in many locations, so the use of organic composts could help increase the yield. Moreover, the preparation of composts is also fairly simple, called the Takakura method. With the training, the participants became aware of how household wastes can be used productively. By the end of the training, the participants learned about the materials needed for composting as well as the process. This has helped reduced wastes at source engaging the public. It has helped produce organic manure for the kitchen gardens and in floriculture.



Photograph 3: A Thimphu citizen composting waste at home

## 3. Open Space and Riverfront Development

The riverbank along the Wangchu River, which flow right through the City, has been identified as a flood-prone area after conducting a flood risk assessment of Thimphu Thromde in 2017.

To protect the riverbank, flood-resilient trees were planted along the river stretch from the crematorium in Hejo to the traditional Bazam in Tashichho Dzong. This is expected to stabilize the slopes along the river, acting as a natural buffer against flooding whilst also increasing water retention. It also adds aesthetic value to the area promoting the concept of a clean and green environment. The next phase of project is being implemented in the Southern part of the City.



*Photograph 4: Wangchu Riverfront Development*

Thimphu City also initiated development of open space into recreational areas. These spaces are no development zones and are developed into beautiful parks with flowers and trees. As the City develops, it is very important to have more open and green spaces. Most of the urban areas around the world are challenged with lack of green spaces which can be dealt with some conscious efforts.



*Photograph 5: Recreation of Open spaces*

#### 4. Slope Stabilization

A hybrid treatment has been designed for the unstable slope in in those areas where road formation cutting has been done. Structural measures such as grouted anchor bolts are being placed and drainage holes are being provided at regular intervals to reduce water



*Photograph 6: Slope Stabilization in Zilukha*

pressure. At the base, a 3-meter-high gabion fascia is also being constructed. After completion of anchor installation and gabion walls, an erosion control mat will be placed at the slide surface to prevent surface erosion. A biotic soil media will then be applied to enable vegetation growth. The location of the parent rock and the slide mass interface will be filled to prevent sub-surface accumulation of water. This initiative has prevented sliding of the slope and at the same time greening of the areas through development of medium enabling vegetation growth.

## 5. Micro Gardening

The Thimphu City has initiated the concept of micro-gardening. Any agency or an organization willing to adopt certain areas within their premises and develop into parks and flower gardens are being encouraged. This initiative helps maintain the area clean preventing illegal waste dumping and at the same time maintain the greenery.



*Photograph 7: View of Public green spaces*



*Photograph 8: Green spaces of private premises*

## Conclusion

Thimphu City has taken great steps for tackling the impacts of Climate Change at community level as well as prompts for individual citizens. Such initiatives bring about significant positive results, elevating the environment of the whole city. Building the systems of Waste drop-off Centers is a beneficial step as it provides responsibility as well as liberty to people in helping managing waste of the city. This followed by technological aid like that of the Waste tracking mobile App makes it easier to adjust into everyday life of people. The choice of putting in collective efforts through community participation and engagement, empathetically develops the region's way of life, which is the need of the hour.