

# Smart Environment with Smart Cities

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**The New Urban idea is a good one and it can get better in implementation if conservation of energy and an encouragement to use non-fossil energy are incorporated in the life-style ecosystem of urban dwelling**

The Government of India has launched a major programme on smart cities. With urbanisation growing at a rapid rate in the country, and the prospect of almost half our population living in towns and cities by 2030, the design of cities, their infrastructure and governance systems acquire great importance. While most of our towns and cities have grown haphazardly, we have opportunities for ensuring that new urban habitat that we design and construct utilises new knowledge and technologies, by which appropriate amenities are available to all the residents in every location as well as in a manner that it is cost effective and friendly to the environment. Cities generally have a large ecological footprint, and if all the economic activities within a town or city are measured in quantitative terms for their ecological impacts, it would be found that the impacts of production and consumption activities in urban areas expand to a substantial distance beyond urban limits. For instance, raw materials, food and other supplies have to be produced elsewhere a wide area and travel a long distance to meet the demands of towns and cities. This means that impacts, including pollution associated with these activities, are not confined to urban locations, but spreads out over a large area of land elsewhere. Before the Olympic Games were held in London in 2012, the city had carried out just such an exercise to assess what London's ecological footprint was in terms of the area that it impacts on. This was estimated at an order of magnitude above the size of London itself.

One issue that would be paramount in the design of new cities as well as in the refurbishment of old towns and cities is the importance of integrating the impacts of climate change on future plans. Cities will need to be designed in a manner that makes them climate resilient. In simple terms, the infrastructure and systems in a city would have to enable adaptation measures being facilitated, by which they are able to reduce the risks from climate change impacts for both life as well as property. In several parts of the world adaptation measures have been taken in hand through clear-cut plans and institutional arrangements. Some of what is being done in other countries is briefly summarised below.

In Africa, most Governments are initiating governance systems for adaptation. Disaster risk management, adjustments in technologies and infrastructure, ecosystem-based approaches, basic public health measures, and livelihood diversification are reducing vulnerability, though efforts tend to be isolated.

In Europe, the adaptation policy has been developed across all levels of Government, with some adaptation planning integrated into coastal and water management, into environmental protection and land planning, and into disaster risk management.

In Asia, adaptation is being facilitated through mainstreaming climate adaptation action into subnational development planning, early warning systems (such as for cyclones and coastal flooding), integrated water resources management, agro-forestry, and coastal re-forestation of mangroves.

In Australasia, planning for sea level rise, and in southern Australia for reduced water availability, is becoming adopted widely. Planning for sea level rise has evolved considerably over the past two decades and shows a diversity of approaches, although its implementation remains piecemeal.

In North America, Governments are engaging in incremental adaptation assessment and planning, particularly at the municipal level. Some proactive adaptation is occurring to protect longer-term investments in energy and public infrastructure.

In Central and South America, ecosystem-based adaptation including protected areas, conservation agreements, and community management of natural areas is occurring. Resilient crop varieties, climate forecasts, and

integrated water resources management are being adopted within the agricultural sector in some areas, but these have major implications for urban and suburban living as well.

Resilience can be defined as the capacity of social, economic and environment systems to cope with a hazardous event or trend or disturbance, responding or re-organising in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation. In the case of urban location, adaptation and consequently climate resilience would need to focus on impacts such as sea level rise, higher temperatures, greater frequency and occurrence of heat waves as well as extreme precipitation events, which have implications for drainage facilities and management of water. Since climate change will get more serious over time, it is important for those responsible for design of cities to evaluate future impacts of climate change, and build in resilience factors at an early stage. Smart cities, being supported by the Government of India, would need to make sure that smart measures incorporate climate resilience as an essential component of urban development plans for the future.

A large number of cities are located in coastal areas. Due to sea level rise projected throughout the 21st century and beyond, coastal systems and low-lying areas will increasingly experience adverse impacts such as submergence, coastal flooding, and coastal erosion. The population and assets projected to be exposed to coastal risks as well as human pressures on coastal ecosystems will increase significantly in the coming decades due to population growth, economic development, and urbanisation. The relative costs of coastal adaptation vary strongly among and within regions and countries for the 21st century. Some low-lying developing countries and small island states are expected to face very high impacts that, in some cases, could have associated damage and adaptation costs of several percentage points of GDP.

One particular impact of climate change which is going to affect almost every region of the world involves the increase in frequency and intensity of extreme precipitation events. The recent floods that took place in Chennai and the 2005 calamity with flooding that occurred in Mumbai are occurrences which will increase in the future. Damage to natural ecosystems, such as wetlands, in urban areas, increases the risks attendant on such flooding. In the case of Mumbai, inadequate drainage was an important factor in the long period for which the water stood across the city and the depth that led to excessive damage and destruction. Similarly, heat waves are on the increase and will become much more common in the future. Hence, buildings would need to be designed efficiently, such that the demand for air-conditioning is minimised. TERI has been at the forefront on designing and constructing energy efficient buildings, whereby demand for energy in a new building can be reduced by as much as 45 per cent.

The concept of Smart Cities provides India with an opportunity to ensure efficient use of resources in buildings, and the incorporation of climate change considerations.

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