Sustainable Cities

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Key Facts

- Half of humanity – 3.5 billion people – lives in cities today and 5 billion people are projected to live in cities by 2030.

- 95 per cent of urban expansion in the next decades will take place in developing world

- 883 million people live in slums today and most them are found in Eastern and South-Eastern Asia.

- The world's cities occupy just 3 per cent of the Earth's land, but account for 60-80 per cent of energy consumption and 75 per cent of carbon emissions.

- Rapid urbanization is exerting pressure on fresh water supplies, sewage, the living environment, and public health

- As of 2016, 90% of urban dwellers have been breathing unsafe air, resulting in 4.2 million deaths due to ambient air pollution. More than half of the global urban population were exposed to air pollution levels at least 2.5 times higher than the safety standard.

Need for Sustainable Development

▶ Sustainable development is the organizing principle for meeting human development goals while simultaneously sustaining the ability of natural systems to provide the natural resources and ecosystem services based upon which the economy and society depend.

▶ The desired result is a state of society where living conditions and resources are used to continue to meet human needs without undermining the integrity and stability of the natural system.

▶ **Sustainable development can be defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs.**
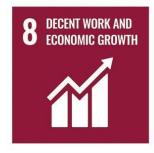
Sustainable Development Goals

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

11.1 By 2030, ensure access for all to adequate, safe and **affordable housing and basic services and upgrade slums**

11.2 By 2030, provide access to safe, affordable, accessible and sustainable **transport systems** for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for **participatory, integrated and sustainable human settlement planning and management in** all countries

11.4 Strengthen efforts to protect and safeguard the world's **cultural and natural heritage**

11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by **disasters, including water-related disasters**, with a focus on protecting the poor and people in vulnerable situations

11.6 By 2030, reduce the adverse per capita **environmental impact of cities**, including by paying special attention to air quality and municipal and other waste management

11.7 By 2030, provide **universal access to safe, inclusive and accessible, green and public spaces,** in particular for women and children, older persons and persons with disabilities

Some Glimpses into Actions Worldwide

1. **COPENHAGEN, DENMARK**

Copenhagen is **often ranked as** one of the greenest cities on the planet. For starters, in 2009 the city set a goal to become the world's **first carbon neutral capital by 2025 as part of its CPH 2025 Climate Plan.**

Copenhagen has focused on reducing energy consumption in a variety of ways, including using an energy-efficient district heating system that connects to nearly every household and innovative cooling systems that save around 70 percent of the energy compared to traditional air conditioning.

Copenhagen has also focused on reducing emissions and improving the health of its residents by improving mobility, integrating transport, and building what's known as a **super cycle highways**. Super cycle highways and other bike lanes around the city have led to 45 percent of the city's residents commuting by bike every day.

2. SAN FRANCISCO, CALIFORNIA

San Francisco and the surrounding Bay Area are a tech-hub and home to some of the most innovative companies in the world, including Salesforce, Airbnb, Uber Twitter. Innovations in technologies to **improve energy efficiency in buildings and enhance its transportation system** have helped make San Francisco a leader in sustainability and clean energy.

The public transport system comprises of hybrid-electric buses and **more than half** of all MUNI buses and light rails are zero-emission.

The Bay Area has also cut its water consumption drastically in recent years. As California has battled serious droughts, San Franciscans have reduced their water consumption to around **49 gallons of water per day** on average **(the national average is 80-100 gallons per day).** These conservation tactics and other advances in sustainable food, recycling, and composting are expected to help San Francisco

3. VANCOUVER, CANADA

In 1990, it became one of the first North American cities to outwardly address the climate crisis by releasing a report called **"The Clouds of Change."** This was just the beginning of an environmental strategy that Vancouver released years later in 2012, the Greenest City Action Plan, which set 10 goals to achieve by 2020, including increasing green jobs, reducing community-based greenhouse gas emissions, and expanding green buildings around the city.

Vancouver has committed to getting **100 percent of its energy** from renewable sources by 2050. This goal is particularly bold given that it targets *all forms of energy* *in the city*—including heating, cooling, and transport—not just electricity. The city's focus on clean energy and sustainability has led it to have the lowest greenhouse gas emissions per person of any major North American city.

Between making sustainable improvements to neighborhoods' energy consumption, striving for zero waste, and continuing to develop its successful **Greenest City Action Plan**, Vancouver has set the stage for businesses and residents to work together to be one of the greenest and

4. STOCKHOLM, SWEDEN

Stockholm is a growing city that seeks to be an attractive home for newcomers and do good for the planet at the same time. Awarded the first "European Green Capital" recognition by the European Commission in 2010, Stockholm aims to be **fossil-fuel free by 2050.**

One component is Sweden's shift **from oil to "district" heating**, which means the nation now uses heat from centralized sources (such as a power station) to more efficiently heat and cool its buildings. District heating alone accounts for over **80 percent of heating and hot** water in apartments today, and is one of the key factors in how Sweden has reduced its greenhouse gas emissions in recent years.

Another reason for Stockholm's success with sustainable living is its residents, who pride themselves on being "climate-smart." **Eight out of 10** residents feel the city should urge citizens to live more environmentally-friendly and believe being climate-smart should be a natural part of living in a city (we do too!).

5. SINGAPORE

With a population of more than five million people, Singapore is often recognized as one of the most forward-thinking green cities in Asia. The city-state has developed a Sustainable Development Blueprint, which **outlines sustainability goals** leading up to 2030.

The targets include improving energy efficiency by 35 percent, ensuring 80 percent of its buildings are certified green, and having 80 percent of households be within a 10-minute walk to a train station.

Singapore has also improved its sustainability by making drastic changes in transportation. The city-state **limits car ownership among its residents** and has built effective public transportation systems, which has helped reduce pollution and crowding on streets and highways. Singapore's public transit system helps residents navigate the city, along with biking and walking.

6. Ouarzazate – Morocco

Morocco is currently home to the largest concentrated solar power plant in the world. The power station on the edge of the Saharan desert will be the size of the country's capital city by the time it is finished in 2018, and will provide electricity for 1.1 million people.

'It is a very, very significant project in Africa,' 'Morocco is showing real leadership and bringing the cost of the technology down in the process.'

The country's plans to generate 42% of its energy from renewables by 2020, with one-third of that total coming from solar, wind and hydropower, it is also currently hosting the UN climate change conference, COP22, in Marrakech!

Tianjin Eco City - China

The Sino-Singapore Tianjin Eco-city has a total land area of 30 km^2 and is planned for a population of 350,000.

The Master Plan for the Eco-city was jointly developed by the China Academy of Urban Planning and Design, the Tianjin Urban Planning and Design Institute, and the Singapore planning team led by the Urban Redevelopment Authority (URA).

It strikes a balance between competing needs of the Eco-city, including social, economic and environmental needs. The planning principles include the following:

- LANDUSE PLANNING – The Eco-city is planned to be compact, with a good mix of land uses. It is developed in a way that maximises the amount of residential, commercial and recreational space within walking distance from public transport, which will increase public transport ridership among residents and workers in the Eco-city. Each district in the Eco-city has amenities and jobs located close by. Local and centralised facilities serve the needs of residents in each neighbourhood.

- TRANSPORT PLANNING – Green transport is a key feature in the transport planning of the Eco-city. The aim is to increase trips via public transport and non-motorised modes of transport within the Eco-city. Hence, the transport network in the Eco-city has been planned to give priority to pedestrians, non-motorised transport and public transport.

- GREEN AND BLUE NETWORK PLANNING- The Eco-city is planned with extensive green (vegetation) and blue (water) networks to create an endearing living and working environment. The green network comprises a green lung at the core of the Eco-city and green-relief eco-corridors to the other parts of the Eco-city. Waterbodies in the Eco-city are linked together for greater water circulation to enhance the ecology and to provide an attractive environment for waterfront development and water-based recreational activities. The Eco-city Administrative Committee, which is the local government of the Eco-city, had rehabilitated and transformed a wastewater pond into the clean and beautiful *Jing Lake*.

Master Plan Overview

The Eco-city can be visualised as *1 Axis, 3 Centres, 4 Districts*. Would it be useful to add a map here? Its hard to visualise this 1 Axis, 3 Districts, 4 Centres concept

•*1 Axis* refers to the Eco-valley that cuts across the Eco-city, providing a scenic trail for pedestrians and cyclists.
•*3 Centres* refers to the main city centre on the promontory on the south bank of the Old Ji Canal and the two sub-centres in the south and the north.
•*4 Districts* refers to the residential districts in the southern, central, northern and north-eastern parts of the Eco-city. Each district contains several housing neighbourhoods, and each neighbourhood comprises a variety of housing types, as well as the respective commercial and amenity centres serving the community.

A key concept in the Master Plan for the Eco-city is the Eco-cell system. Eco-cells are basic building blocks and each of them is about 400 m by 400 m. Four Eco-cells make an Eco-neighbourhood, and several Eco-neighbourhoods form an Eco-district. There are four Eco-districts in the Eco-city. The Eco-cell system encourages walking as 400 m is generally accepted as a comfortable walking distance.

What are we doing in India ?

▶ Various Initiatives under Ministry of Environment, Forests and Climate Change, GoI

▶ Various Initiatives under Ministry of Housing and Urban Affairs, GoI

▶ Private initiatives

Role of HEIs

- **Campuses as 'best practice' sustainability cases**
  - Water sensitive, reduce, recycle, reuse
  - Power saving devices, sensors, solar power
  - Design with nature
  - Compact for ease of mobility
  - Safety Features
  - Inclusive Features
- **Awareness programmes**
  - Faculty
  - Staff
  - Students
  - Parents
- **Tailor made short programmes, Full fledged academic programmes**
- **Specialisation and Research**

Thank you