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Building Smart Cities for an Inclusive, Sustainable, and Resilient Communities

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Major Global Challenges

UN forecast indicates that the world population will be 8.5 billion by 2030 and 9.7 billion by 2050.

Smart cities can play a significant role to accommodate such population growth by making cities and communities more safe, resilient, liveable, and sustainable.



Urbanization

- The United Nations predicted that an estimated 2.5 billion more people are expected to be living in cities by 2050.
- Majority of this expansion will be occurred in developing regions of Asia and the Pacific.



Asia is the most urbanizing region in the world.



Motorization

- An Asian urban resident spends in traffic congestion is about 35-40 hr./year, and by 2050, that will increase to 106 hours/ year, three times more than today (The Future of Urban Mobility Report).
- Asian countries lose almost 3-4 % of their GDP due to delayed time and fuel loss.



Climate Change and Global Warming

- As most of the cities in Asia and the Pacific are located along the coastline, they are at high risk of global warming and sea levels rise.
- Over 800 million people living in 570 coastal cities will be at risk of sea-level rise and coastal flooding (C40, 2019).
- In a business-as-usual scenario, the global economic losses from coastal flooding may exceed US \$1 trillion annually by 2050 unless the major coastal cities prepare for it (Hallegatte et. al, 2013).



Photo : Urban flooding in Zhengzhou, China's Henan Province, on 23 July 2021; Photo source: https://asia.nikkei.com/

Air pollution

- WHO data show that almost all of the global population i.e. 99% breathe air that exceeds WHO guideline limits and contains high levels of pollutants.
- 4.8 million death occurs every year due to exposure to outdoor air pollution (WHO, 2022).
- Smart technologies can help smart city governments to monitor and reduce air pollution with the help of the Internet of Things (IoT) and sensors.

Air pollution in Asian cities



Source: "Average PM2.5 concentration of the most polluted capital cities in the world in 2019 (in micrograms per cubic meter of air)," Statista.

Graph source: www.brookings.edu

Global challenges and need for smart city

- Food: Estimated 193 million people are acutely food insecure and in need of urgent assistance (The Global Report on Food Crises, 2022)
- Health: About 400 million people have no basic healthcare and this number had been increased due to COVID-19. (https://www.undp.org/sustainabledevelopment-goals#good-health)

Education: More than 168 million children are out of school due to COVID-19 globally for almost a full year, says UNICEF (https://www.unicef.org/turkiye/en/press-releases/covid-19-schools-more-

168-million-children-globally-have-been-completely-closed)

Water Shortage: 2.1 billion people are undergoing urbanization and have inaccessibility to clean drinking water as a result of pollution, poverty, and poor management of resources.

Challenges in SIDS

- Due to their small geographic size and remoteness, SIDS are facing a lot of socio-economic issues that compound their ability to bounce back from disasters.
- With rising urbanization and motorization, many cities are facing numerous challenges due to rapid population growth, old and inadequate infrastructures, etc.

Aerial view on the coastline of the Seychelles Islands and luxury Eden Island from Victoria viewpoint, Mahe.

Three Pillars of Smart Liveable city



Smart city solutions

Smart urban Agriculture



https://smallaxepeppers.com/

Smart Water Management

ng



Photo source: https://uvpure.com

Smart Health



Smart Education



Photo source: startupfactories.co.uk/



Smart city cases: Shinjuku Station, Tokyo





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According to Guinness World Records, Shinjuku station used by about 3.59 million people per day (in 2018) which making it the world's busiest station.



Shinjuku Station opened in 1885 and has a total of 53 platforms, over 200 exits, and many department stores and shopping malls which are well connected to the station. There are two bus terminals in the west and south exits.







JAPANESE CASE

Shinjuku Expressway Bus Terminal, Tokyo, Japan

Japan's largest bus terminal where more than 1,600 Bus operate every day connecting 300 cities in 39 prefectures across Japan

Integrated urban planning and mixed-use development for smart city



Integrated urban and transport planning, mixed-use, compact and connected urban development, universal design, and non-motorized transport options can significantly enhance the quality of the public transport system for seamless mobility.

It is important to make resilient infrastructure and services pan particularly, amphibious buses operating in Japanese cities



Many Asian cities are suffering from severe snowfall during the winters.





- Japan is facing population decline and an aging population, many old people are surrendering their driver's licenses, a shortage of bus drivers, and challenges in maintaining public transportation services.
- As a solution, Japan has introduced different types of autonomous buses to improve accessibility and connectivity.

UNCRD Smart City Project

- Acknowledging the profound impact of Sea level rise and health emergencies like COVID-19 pandemics in developing countries.
- UNCRD launched a Smart City Programme in 2021 which aims to provide technical assistance and support to urban policymakers, planners, and city officials, particularly from the LDCs and the SIDS for building their cities smart, and resilient through smart city solutions.



Connecting Megacities by Magnetic-levitation train: Japan case

High Speed: 603 kilometers per hour

https://www.maglev.net/maglevbenefits#:~:text=Magnetic%20levitation%20tec hnology%20eliminated%20the,making%20a%20 derailment%20virtually%20impossible.

Tokaido Shinkansen & Chuo Shinkansen



Estimated construction cost is **9 trillion yen** for the Tokyo-Osaka (Source: asia.nikkei.com)

It will take only 67-minute by Magnetic-levitation train compared to 2 hr & 22 minutes to travel the 515 km from Tokyo to Osaka on the existing Shinkansen, which have significant socioeconomic implications.



After the completion of the project the great metropolitan areas of Tokyo, Nagoya, and Osaka will function as one metropolitan area, and with a population of 75 million and travel time of one hour, it will become the world's largest economic area with great economic impacts (Shigeru Morichi -Japan SPOTLIGHT May / June 2015)

Source: Compiled by Author

UNCRD Smart City Project : Capacity Building



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- UNCRD will organize a series of capacity building programs and training workshops to assist member countries in building their cities and communities safer, smarter, and sustainable.
- To contribute towards achieving the 2030 Agenda/ SDGs, and the Paris Agreement, the smart city programme further aims to contribute number of SDGs focusing particularly on the Goal 11 - "Building Sustainable Cities and Communities"

Smart cities can transform the Communities

The use of state-of-the-art advance smart technologies and solutions such as IoT, ITS, GPS, sensors, smart cards, mobile apps; and other advances can bring several benefits-

- Economic benefits
- Social integration
- Environmental protection
- Improve safety and security
- Efficiency and comfort
- Enhance mobility, accessibility, and connectivity
- Reduce traffic congestion, air pollution, traffic accidents, and fatalities
- Natural resource optimization
- Improve the quality of life and sustainability





Please suggest what issues and challenges that your cities are facing in the covid era?