Smart Cities and Infrastructure

Introduction of the Issues Paper

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Structure

- Urbanization & SDGs
- Defining Smart Cities
- Components of Smart Infrastructure
- Key Challenges in Applying Smart Infrastructure Concepts
- STI driven Policy Instruments
- Smart Infrastructure Design Principles
Urbanization & SDGs

More than half of the global population currently lives in urban areas, with that proportion projected to reach two-thirds by 2050, according to the UN World Urbanization Prospects report.
SDG 11: Make cities and human settlements inclusive, safe, resilient and sustainable

No sustainable development without sustainable urban development
Defining Smart Cities

“A smart sustainable city is an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental as well as cultural aspects”

ITU study group on SSC
Smart Infrastructure

- Smart Physical Infrastructure
- Smart Digital Infrastructure
Smart Physical Infrastructure: Example

- **Smart Energy**: Meeting energy needs in a sustainable and cost-effective manner

- **Includes**:
  - Smart Grids
  - Automated demand response
  - Micro-grids
  - Virtual power plants
  - Smart meters

Smart Grid, Kashiwa-no-ha, Japan

Smart Grid, Puducherry, India
Smart Digital Infrastructure

Cheap and real-time transmission of large amounts of collected data

- Sensors and actuation technology
  - Sensor technology for data collection
  - Actuators (i.e., remotely controllable devices like controllable building thermostats)

Low-cost and standardized set of sensors and actuation devices

ICT at the core of smart cities

- For collecting and sending information to users and actuators
- Availability, security, and affordability key

Fast, large-scale data analytics for complex prediction models

Data warehouses

- Secure data warehouses
- Policy framework on data usage
- Checks and balances to ensure privacy and security

Advanced applications and analytics

- Steering according to real-time information and analytics

Adequate access to anonymized real-time city data for predictive actions
Need for an Integrated Approach for Smart Infrastructure

- Co-location of smart infrastructure
- Integrating data generated by different smart infrastructures
- Smart infrastructure as a system that integrates the core domains of sustainability
Smart Infrastructure is Context Specific

Developed Countries
- Need to maintain legacy infrastructure systems
- Monitoring of operations
- Facilitate optimal use of existing infrastructure

Developing Countries
- Absence of legacy infrastructure
- Technology leapfrogging through smart infrastructure
Addressing some key challenges in applying Smart Infrastructure Concepts through STI driven Policy Instruments
Challenge I : Localization of Smart Infrastructure

Policy Instruments

- Harness the local innovation system

Smart Shacks, South Africa
Challenge I: Localization of Smart Infrastructure

Policy Instruments

- Make it a priority theme for local STI institutions
- Promote open data, open science models
- Establish urban innovation units and living labs
- Exploit regional innovation networks and global collaborations
Challenge II: Skills Gap

- Accelerate STEM education programs
- Reform Curricula and promote Multi-disciplinary Learning
- Develop MOOCs, m-learning and other ICT tools
- Partner with Technology Firms
Challenge III: Lack of Finance and well developed Business Models

Policy Instruments

Technology Driven Innovative Financing Models
Challenge III: Lack of Finance and well developed Business Models

Policy Instruments

- Crowdfunding Platforms
- Monetizing Smart Data
- Smarter use of existing public resources
Challenge IV: Applying a Suitable Governance Model

Policy Instruments

- Smart City Operation Centers to Break down Administrative Silos
- Platforms for Bottom-up Participatory Governance
- Effective Use of Overall Smart City Agenda, Smart City Strategies and Technology Plans
Challenge V: Making Smart Cities Inclusive

Policy Instruments

- Develop smart infrastructure targeting all vulnerable groups
- Making Smart Cities Gender Inclusive
- Use data generated by smart infrastructure to ensure inclusiveness
Smart Infrastructure Design Principles

- People-Centered and Inclusive Infrastructure
- Resilience and Sustainability
- Interoperability and Flexibility
- Managing Risks and Ensuring Safety
Thank You