



2021-2022 Inter-Sessional Panel

Science, Technology, and Innovation for Sustainable Urban Development in a Post-COVID World

**UN CSTD Secretariat
18 November, 2021**

Outline

- The imperative of sustainable urban development
 - Urbanization trends
 - Urban sustainability challenges
 - COVID-19 pandemic & sustainable urban development
- Applying STI for sustainable development
- Policy recommendations

Urbanization trends

- > 4 billion people in urban areas in 2017
- Urban areas expand & absorb most future population growth
- $\frac{2}{3}$ of the global population to live in urban areas by 2050
- Urban shrinkage as a parallel phenomenon
- Urban population aging
- Hence unprecedented challenges with deep impact on the configuration of urban systems and their functioning

Main urban sustainability challenges

Urban Sustainability Challenges	Urban Sustainability Dimensions		
	Green	Productive	Inclusive
Inefficient and polluting urban energy systems	■		■
Unsustainable urban production and consumption patterns	■		■
Urban water scarcity	■		■
Urban traffic congestion and vehicle emissions	■		■
Limited access to decent urban employment opportunities and growing inequalities		■	■
Unaffordable and poor-quality housing	■	■	■
Uneven access to quality education		■	■
Gender-based inequalities and violence against women and girls		■	■
Defective urban planning practices	■	■	■
Vulnerable healthcare systems			■
Urban violence and insecurity			■
Vulnerability to natural disasters			■

COVID-19 pandemic & sustainable urban development (1/2)

- up to 90% of the COVID-19 cases reported worldwide
- Pandemic led to a global economic crisis
- Existing inequalities & the level of poverty increased
- Social distancing and lockdown measures have modified patterns of energy and transport demand worldwide
 - Reduced greenhouse gas emissions in many urban areas
 - Other environmental challenges (e.g., plastic waste) have been exacerbated

COVID-19 pandemic & sustainable urban development (2/2)

- Urban areas: the locus of crucial urban sustainability lessons
- Incapability of many urban settings to deliver on the expectations of disaster & risk management for urban resilience & sustainability
- STI: a pivotal role in equipping societies to improve sustainability and resilience of urban systems

Applying STI for sustainable urban development

- STI solutions
 - mitigate most pressing urban sustainability challenges; &
 - harness value embedded in the global population growth
- The issue paper looks at
 - Both technological and non-technological innovations
 - Grouped into 12 categories in response to the 12 main challenges

STI solutions to urban sustainability challenges (1/3)

Urban Sustainability Challenges	Category	STI Solutions
Inefficient and polluting urban energy systems	Energy	Biomass energy systems; Solar energy systems; Hydropower energy system; Geothermal energy systems; Wind energy systems; Green hydrogen technology; Energy efficiency in the construction sector
Unsustainable urban production and consumption patterns	Circularity	Product-service systems; Matchmaking platforms for exchanging resources; Environmental labelling; Food traceability systems; Food sharing networks and technology; PAYT pricing models; Smart bin solutions; Single-use plastic ban; Circular economy for plastic; Cup-as-a-service subscription models; Data platforms for plastic waste mapping; Digital systems for automatic hazardous waste detection; Robotic systems for waste management; Right-to-repair standards; Urban mining techniques
Urban water scarcity	Water	Smart metering infrastructures; Nanotechnological applications for desalination processes; Sensor-based water protection systems; Portable testing kits for real-time quality control; Satellite technology; Mobile applications for waste monitoring
Urban traffic congestion and vehicle emissions	Mobility	Low-emission vehicles; Journey planner applications; Real-time traffic management systems; Mobile ticketing; Mobility as a Service; Bike sharing systems; Cycle-to-work schemes

STI solutions to urban sustainability challenges (2/3)

Urban Sustainability Challenges	Category	STI Solutions
Limited access to decent urban employment opportunities and growing inequalities	Economic prosperity and financial stability	Dedicated urban zones for STI development; Digital finance; E-commerce platforms; ICT-related education and training programs; Innovative data management systems; Cash transfer schemes and programs; Smart technologies to fight forced labor and modern slavery
Unaffordable and poor-quality housing	Housing	Digitalization of construction operations and manufacturing processes; Digital twin technology in construction; Predictive analytics; Environmentally sound technologies; Smart building solutions
Uneven access to quality education	Education	Touch-screen tablet solutions; Speech recognition software; Adaptive learning technology; Augmented reality; Learning platform solutions; Place-based digital education strategies; Digital learning masterplans; Education for sustainable development
Gender-based inequalities and violence against women and girls	Gender empowerment and equality	Gender-pay-gap regulations; Compensation management platforms; Anti-violence online services; Awareness-raising measures and education

STI solutions to urban sustainability challenges (3/3)

Urban Sustainability Challenges	Category	STI Solutions
Defective urban planning practices	Urban planning	Spatial group model building; Gamification for digital participation; Digital twin technology for urban planning; Online crowdsourcing platforms
Vulnerable healthcare systems	Healthcare	Digital communication channels as early-warning systems; Wearable health devices; Remote clinical services; Crowdfunding platforms; Dashboard solutions
Urban violence and insecurity	Safety and security	Crime prevention policy; Gunshot detection technology; Crime mapping tools; Predictive profiling technology
Vulnerability to natural disasters	Protection from natural disasters	Disaster data infrastructure; Nature-based solutions

Policy recommendations (1/2)

- Action necessary at national and international levels
 - Seizing the innovation momentum from the Covid 19
 - using the transformative power of STI to deliver on their commitment to sustainable urban development
- The issue paper
 - presents a comprehensive set of policy recommendations;
 - specific considerations by national governments and the international community

Policy recommendations (2/2)

- Adjust pre-COVID priorities and resource allocation strategies
- Find and share STI solutions for sustainable urban environments
- Cultivate and empower local ecosystems for urban innovation
- Protect against the unperceived complexity of urban digital transformations
- Introduce new and more equitable financing mechanisms
- Rethink urban areas as data infrastructures
- Integrate policy settings for sustainable urban development
- Boost scale-up and spreading operations
- Building capacity around digital mindsets, skills, and technology acceptance



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Thank you for your attention!

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