

**INTERSESSIONAL PANEL OF THE UNITED NATIONS COMMISSION
ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (CSTD)**

**Geneva, Switzerland
17-19 November 2021**

Contribution by UN-Habitat

to the CSTD 2021-2022 priority theme on “Science, technology and innovation for sustainable urban development in a post-COVID world”

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Theme: STI for sustainable urban development in a post-COVID world

United Nations Commission on Science and Technology for Development (CSTD)

Overview - UN-Habitat approach to STI

Frontier technologies are profoundly influencing the emergence of smart cities, how we build and manage our cities and human settlements, and how urban managers take more informed decisions. The New Urban Agenda 2016-2036, a negotiated agreement of the UN member States on global principles and goals of sustainable urban development, calls for technology and communication networks to be strengthened and for smart city approaches that use digitalization, clean energy, and technologies to boost economic growth and improve service delivery, while promoting broad-based inclusion in cities.

Cities are at the centre of new paradigms in the use of technology and innovation to advance sustainable development. UN-Habitat integrates new technologies and innovative practices into its normative and operational activities and develops new ways to collect and use data to improve the quality of life for all in urbanised areas by reducing inequalities, especially by engaging underserved populations, and by improving knowledge that promotes inclusive and responsive urban management, such as through e-governance. UN-Habitat is bringing the 'Secretary-General's Roadmap for Digital Cooperation' and its urban expertise to key United Nations digital networks, including the High-Level Committee on Programmes Working Group on Artificial Intelligence, the United Nations Innovation Network and the United Nations Network on Smart Cities.

The following summary of projects highlights some of the innovative solutions being developed by UN-Habitat to help member States and other partners accelerate the delivery of sustainable development impacts and address human rights issues.

1. Can you give **examples of projects/policies** in your organization **helping countries undertake transition towards urban sustainability** so that cities are productive, inclusive, and liveable? What are the main challenges confronted while trying to implement these projects/policies?

Examples of global project activities:

Block by Block: Using Minecraft as an E-Governance Tool for public space design

ICTs can offer new opportunities for citizens, particularly children and youth, to take part in decision making and governance processes, and the innovative use of technology can help bridge the digital divides across gender, age, geography and income. While digital platforms are increasingly integral to cities, it is important that these are accessible to everyone.

In 2012 UN-Habitat entered into a partnership with Mojang, the company that makes Minecraft. Through this partnership, which has been called '[Block by Block](#)', UN-Habitat uses Minecraft as a tool to ensure the participation and inclusion of citizens in our public space work. Minecraft is one of the world's most popular video games and is best described as a kind of digital Lego in which players place various colored blocks in a three-dimensional environment with the purpose of building creative structures such as buildings or cities.

UN-Habitat has used the Block by Block methodology in public space upgrading projects in more than 40 countries and territories, including Nigeria, Kenya, South Africa, Peru, Mexico, Haiti, Nepal, Bangladesh, India, China and Kosovo. In workshops, UN-Habitat and partners bring people together to visualize their own public space design ideas in Minecraft and present these to city officials. The Minecraft designs are then used as part of the process of implementing real public space improvement projects. Using technology as a participatory tool in urban planning and design in this way is a useful way of including non-traditional stakeholders in bottom-up

decision-making processes. The lessons and experiences from using Minecraft, such as in the project on ‘Mixed reality for public participation in urban and public space design’ (see Question 3) show that it is a good way of including youth, women and girls in planning processes from the onset. The game promotes creativity, innovation and visual learning, helps encourage dialogue between different groups and contributes to the development of important skills such as collaboration, public speaking and negotiation.

Local implementation of the SDGs through Global Future Cities Programme:

UN-Habitat, with the support of private sector consortia under UK Prosperity Fund ‘[Global Future Cities Programme](#)’, is furthering local impact on **liveable and productive** urban transformation by improving the way cities are planned and managed. UN-Habitat’s Urban Lab provided a participatory ‘SDG Project Assessment Tool’ which assists city authorities to develop projects on urban planning, mobility and resilience including data and financing strategies that implement SDGs and conditions for local authorities to adapt global frameworks to local contexts and conditions. A core component of the Programme is the ‘Future Cities Knowledge Platform’, a digital platform of tools, reports, publications, best practices and a community forum developed to support the implementation of urban projects and facilitate city-to-city learning within the programme and globally.¹ Specifically, the programme outcomes address spatial equality, inclusive prosperity, resilient communities and built environments and builds the capacities of cities to take ownership and developed strategies and planning practices to sustain the projects’ beyond the programme.

A UN-Habitat Flagship Programme on People-centred Smart Cities

UN-Habitat is running a Flagship Programme on implementing ‘[People-Centred Smart Cities](#)’ which addresses **productivity and inclusivity** of cities, among other objectives. As the world becomes more digital there are opportunities for technologies to serve people, and improve public services and working conditions. However, the fact that around half the world’s population remains offline and the stark digital divide for women and marginalized groups are major challenges for progressing inclusive digitisation. Digital democracy and connecting all the world’s people by 2030 is a priority for sustainable development and gender equality. UN-Habitat supports local and national governments with their digital transition and smart city planning as well as promotes the digital rights for residents and cities to be heard. Projects such as The Digital Helpdesk, Digital Governance Labs and Digital Rights in Cities Framework highlight the tools and other work under this Flagship Programme. See also question 3 for examples of UN-Habitat’s work on city-wide spatial analysis strategies that use inclusive technology to improve spatial connectivity and compact structures for better productivity.

Examples of global policy and normative guidance:

UN-Habitat’s support for National Urban Policies

UN-Habitat’s contribution to developed of National Urban **Policies** includes country assessment and advice on setting up of national processes and stakeholder participation; documentation of good practices to support national processes such as on the [Urban Policy Platform](#); analysis of urban planning policies and instruments; facilitation of local-national dialogue on reforms; dissemination and capacity development on the urban policy across the full range of actors; close monitoring of the progress and impacts of National Urban Policies globally by the production of [Global State of National Urban Policy](#) reports in partnership with OECD, and further development of the Policy approaches with UCLG, OECD, Cities Alliance, RMIT and International Science Council, and the member States.

¹ As of 2020, the Global Future Cities Programme of UN-Habitat was working to increase prosperity and alleviate urban poverty through 30 projects in 19 cities across ten countries.

The benefits expected with the development of a national urban policy are comprehensive:

- ✓ Identification of urban development priorities towards socially and economically equitable and environmentally friendly urban and national development
- ✓ Guidance on the future development of the national urban *system* and its spatial fabric concretized through national and regional spatial plans for regional/territorial development;
- ✓ Better coordination and guidance of actions by national stakeholders and by lower levels of government across sectors;
- ✓ Better coordinated private and public investments in urban development and consequent improvement of cities' productivity, inclusiveness and environmental conditions.

The process of developing a National Urban Policy is the key step for reasserting urban space and territoriality. It is also vital in providing the needed direction and course of action to support urban development. The Policy provides an overarching coordinating framework to deal with the most pressing issues related to rapid urban development, including slum prevention and regularization, access to land, basic services and infrastructure, urban legislation, delegation of authority to sub-national and local governments, financial flows, urban planning regulations, urban mobility and urban energy requirements as well as job creation.

Brazil, China and South Africa are examples where clear National Urban Policies have been vital in orientating action to tackle inequality and to energize the development process. UN-Habitat has supported several urban policy development processes including those of Burundi, Malawi, Mongolia and Sri Lanka. In total, UN-Habitat tools, guides and approaches on NUP have been used in over 40 countries, and Urban Policies have been adopted and embedded into the institutions and policies of over 150 countries.

National Urban Policy as a driver for inclusivity and prosperity in cities: Example of Bolivia

As one of the last countries in Latin America to urbanize, Bolivia's rapid pace of transformation requires timely and decisive action to address the challenges and opportunities that come with it. Rapid urban expansion of cities has led to shortages in adequate housing and public services such as transportation and health, waste management infrastructures and employment opportunities. It also causes socio-spatial inequalities, environmental pollution, low productivity and other issues.

UN-Habitat is working with the Government of Bolivia to develop the National **Policy** for 'the Integral Development of Cities', as the strategic instrument to guide urban development for the next 15 years. The National Policy combines a systemic approach and the reinforcement of urban governance to promote balanced development across three levels: city, territorial and national. It identifies the challenges of urbanization in Bolivia and proposes policy action to foster inclusive, sustainable and productive cities in line with the national principle of 'Living Well'.

Prosperous cities in Bolivia' a priority agenda Stakeholder participation was at the forefront of this process, with more than 250 consultation events and two National Urban Forums held throughout the country and participation of more than 7,000 stakeholders from all levels of government, civil society, academia and the private sector.

UN-Habitat normative and operational guidance on SDG's localisation

UN-Habitat supports the achievement of the 2030 Agenda and its SDGs at the local level according to the New Urban Agenda commitments and principles. UN-Habitat's work ensures the SDGs' innovative characteristics (universal, interconnected, and indivisible) are carried through to the local levels. The rapid local adoption and

implementation of the SDGs has become increasingly crucial to avoid a reversal of the progress made since 2015 and to support an inclusive, resilient and sustainable pandemic recovery.

UN-Habitat's strategy on SDG localization focuses on multi-level, integrated partnerships to connect all components of the SDG implementation: from normative support on inclusive data collection to evidence-based **policy** making, and from project implementation support to monitoring, reporting and knowledge sharing systems. UN-Habitat led the development of 'Global Urban Monitoring Framework' that harmonizes existing indexes while incorporating rural-urban linkages and the principle of leaving no one behind. It is composed of a core set of global indicators and a series of secondary sets of indicators, to allow for the adaptation and analysis of each locality while aligning with local visions for cities. The framework is a useful basis for the preparation of Voluntary National Reviews and Voluntary Local Reviews, as well as UN Common Country Assessments.

The Monitoring Framework is at the heart of UN-Habitat's approach to data and indicators for SDG localization and the work on VLRs. It will be digitized through a partnership with the Global CEO Alliance into a system that allows cities to measure and compare their development performance. The worldwide roll-out is expected to take place during 2022. The Framework is envisaged to be efficient, by not adding a burden on cities; effective, in that it is able to concretely assist cities to track their progress; and harmonized, with comparable data. The [Urban Agenda Platform](#), hosted by UN-Habitat, is an essential element in creating global community around local implementation of the SDGs. It brings together in one online space the cities and all other interested in urban monitoring, effective practices, cities working on their VLRs and more.

Localisation of SDGs through [Voluntary Local Reviews](#) ('VLRs') is transformation from the bottom up, of local innovation and of increased global dialogue. The VLR global movement has grown exponentially since 2020 with 65 current VLRs, and about 20 more in the pipeline. VLRs have become established as one of the main tools for local and regional governments to monitor and report on SDG progress and have proven to be powerful accelerators of the SDG localization worldwide. UN-Habitat with partners such as United Cities and Local Governments support cities in developing VLRs with cutting-edge data and strategic and technical insights, through peer learning as well as by developing a [Guideline](#) for city authorities. VLRs can greatly enhance data, stakeholder inclusion and participation, policy coherence, strategic planning and multi-level governance between the local and national levels.

The New Urban Agenda Illustrated handbook

The [New Urban Agenda](#), adopted at Habitat III conference in 2016, presents a paradigm shift based on the science of cities and lays out standards and principles for the planning, construction, development, management and improvement of urban areas. The New Urban Agenda is a resource for actors in multiple levels of government and for civil society organizations, the private sector and all who reside in urbanized spaces. The New Urban Agenda highlights linkages between sustainable urbanization and job creation, livelihood opportunities and improved environmental conditions and quality of life, and it insists on integration of these sectors in every urban development **policy**. The New Urban Agenda works as an accelerator of the SDGs, particularly SDG 11 to provide a comprehensive framework to guide and track urbanization around the globe. Cognizant of the fact that 95 per cent of the urban growth will be in the developing world, SDG 11 sets targets and defines indicators to measure progress and growth.

The [New Urban Agenda Illustrated](#) handbook serves as the base for the New Urban Agenda online learning tool, a self-paced course in two parts ([part 1](#), [part 2](#)) which are available for free. The course further breaks down the contents of the New Urban Agenda in an interactive and engaging format. It supports a stronger understanding and implementation of the propositions contained in the New Urban Agenda by subdividing the New Urban Agenda into three chapters: 1) Core Dimensions, 2) Means of Implementation and 3) Governance, Follow-up and Review.

The New Urban Agenda Illustrated handbook is prepared with all types of urban stakeholders on mind. It analyses the propositions of the New Urban Agenda and their synergies with the SDGs and their Targets, and enriches them with visual illustrations, diverse examples and practical suggestions for action. Key topics related to sustainable urban development are explained in summary, and each can be further investigated and explored. The handbook aims to address high level policy decisions for just, green and inclusive growth and development of cities.

Digital Governance in Cities Framework:

New technologies are rapidly advancing the capabilities of local governments to deliver services, the need for which has been highlighted by the Covid-19 pandemic. However, the growing use of digital technologies have sparked debate around how they should be regulated and managed, what values and principles should guide their use, and the role of local governments in ensuring digital technologies are appropriately deployed, their risks mitigated and their potential harnessed for the benefit of all. Issues of digital inclusion and digital human rights are emerging, as intelligent systems and data intensive technologies can reinforce existing biases and discrimination and also make it easier for the public and private sector organizations to track, analyze, predict and to some degree manipulate people's behaviours.

Local governments can play an important role in countering the challenges and risks of digitization. Digital governance can provide a framework for establishing accountability, engaging citizens and achieving efficiency and cost-effectiveness while leaving no one behind. However, digital governance is a new topic to many local governments and there is often a significant mismatch between their capabilities and that of the big technology firms that they often procure technology from and/or contract them for deploying new technologies.

To provide appropriate technical and strategic advice on digital governance to national and local governments undergoing digital transformation, more knowledge on best practices regarding urban digital governance is needed. Through this initiative, UN-Habitat and CAF intend to collaborate to build a body of this knowledge and translate it into actionable cooperation projects that enable Latin American cities, and others, to in place measures to address digital governance challenges and foster awareness of the importance of digital governance to promote trust, integrity and transparency. More details on the support provided by UN-Habitat within the Digital Governance framework under the question 4.

2. In your organization's view, how has the **Covid-19 pandemic so far impacted** on sustainable urban development, and what **lessons** could we draw from the Covid-19 pandemic on sustainable urban development?

Over the last eighteen months the COVID-19 pandemic has highlighted the crucial importance of merging public health and urban and territorial planning goals and shown us how intimately tied these two sectors truly are. Cities have been at the forefront of the battle against COVID-19, facing great challenges but also elevating their role as leaders in innovative planning strategies to encourage enhanced resiliency, social distancing, and fast economic recoveries. The pandemic has shown how related the challenges of the pandemic and the barriers to healthy urbanism are. Unregulated urban growth led to overcrowding and worsened the spread of COVID-19 in many urban areas, while patterns of sprawl have resulted in decreased access to essential health services and increased comorbidities among urban populations.

Structured inequalities were exposed and deepened in this health crisis, and the need to analyse urban and health concepts through new lenses has been highlighted. Debates on the health dimensions of spatial configurations such as urban density, morphology, public space, housing, and urban infrastructure have been

more prevalent in many societies. This reveals the growing interest among people in the challenges faced and opportunities available in urban areas. For example, taking the case of urban density, UN-Habitat's research for a global Report on '[Cities and Pandemics: Towards a more just, green and healthy future](#)' found out that overcrowding has emerged as the predominant driver for the spread of Covid-19 in cities. However, the study also discovered that high density in a context of well-planned proximity was a key factor to ensure better response coordination and equitable access to public services.

After the first year of the pandemic, it had indeed become evident that space truly matters in the response, recovery and rebuilding processes, waking up the world to the need to rethink and reconfigure the form and function of cities as the spatial determinants of healthy daily living.

As with previous outbreaks, the global health crisis has transformed into a socio-economic crisis where people are not only affected by the pandemic but also by the interruption of urban services. For groups already living in "environments of inequality", such as persons with disabilities, children, the elderly, migrants and refugees, the impacts of long-term social exclusion have left them more exposed to the effects of the pandemic. The statistics on increasing poverty rates are especially evident in cities, where the pandemic has exacerbated the multiple deprivations of the urban poor. Another critical aspect is the growing digital divide between urban spaces, communities, and different types of employment within and between countries.

As COVID-19 continues to produce painful **lessons** on the shortcomings and failures of many cities to protect their own citizens, the mitigation measures put in place by authorities have shown that governments are capable of rapid transformation when compelled to do so, pointing the way forward for a better, more sustainable urban future. Some of the most effective responses to the pandemic have been designed and led by cities, building on their ability to concentrate knowledge, resources and infrastructure. While there is no single template for success, the UN-Habitat Report on Cities and Pandemics established several factors that broadly characterize the different effective responses of cities and regions to the pandemic:

- ✓ *The response to the pandemic succeeds along with medical responses, when it harnesses the transformative potential of cities and the power of collaborative national and local governments:* We must understand that the trajectory of sustainable development is the well-planned and governed cities that spearhead the reforms towards a New Social Contract, based on collective, rights-based recovery that reduces poverty, strengthens social and environmental protections, restores public trust and reaches people who face discrimination.
- ✓ *Multisector, integrated strategies that address the different dimensions of the pandemic and do not leave anyone behind:* The impact of COVID-19 has not only had devastating health outcomes, but also disrupted livelihoods and education. Governments have therefore needed to develop wide ranging programmes that also deliver economic protections for low-income and marginalized communities. In Kenya, for instance, an ambitious programme called Kazi Mtaani ("Jobs in the Neighbourhood") was piloted in eight slums in Nairobi, Mombasa and other cities to recruit residents as paid workers in a public settlement upgrading programme.
- ✓ *A strong emphasis on community-based engagement and learning:* Notwithstanding the importance of central resources and a coherent national strategy to coordinate efforts, these must also be underlined by popular support and locally led. In Kerala, India, one of the key elements in its remarkable success during the first phase of the pandemic was the state's strong decentralized decision making structures. This, combined with its recent experience of the deadly Nipah virus, enabled a rapid mobilization of emergency shelter, health care and food assistance.
- ✓ *An ability to adapt creatively to the changed circumstances of COVID-19:* Flexibility and creativity have been essential elements in meeting the challenges of the pandemic in many cities. In Lima, Peru, where the majority of the population used public transport before the pandemic, the city authorities

responded to the reduction in bus by installing emergency bike lanes and supporting the rollout of a low-cost bicycle that, besides providing residents with an affordable model, would also aid the city's economic recovery by being manufactured locally.

3. Could you share specific **examples, projects or initiatives that have used science, technology, and innovation** (STI), including **frontier technologies** (e.g., AI, drones, blockchain, 3D printing, etc.) or other forms of innovation in general in addressing the above challenges in relation to urban sustainability transition?

Mixed reality for public participation in urban and public space design

In 2017, through a collaboration with the technology company Ericsson, UN-Habitat began exploring how brand-new technologies such as virtual and augmented reality can facilitate dialogue between professionals and non-professionals about urban design and encourage civic participation.

Building on UN-Habitat and Mojang's experience with Block by Block (see question 1), the Ericsson Strategic Design Lab developed a ['mixed-reality' prototype](#) that can visualise digital designs, including Minecraft designs, in physical public spaces. Mixed reality can be considered the blending of augmented and virtual reality, enabling digital objects to coexist and interact with the physical environment in real time. Through these kinds of platforms, people can experience three-dimensional architectural designs and models as if they were present in the physical space, or make real-time changes to the physical environment, for example placing furniture on a street, changing the colour of a building or imagining a new skyline. Using the mixed reality platform adds additional steps to the Block by Block process. Citizens can produce rough three-dimensional sketches in Minecraft and then visualise them in the public space itself. Similarly, design professionals can present their designs to stakeholders in the space itself, thus making the designs more accessible and providing opportunities to consider them from different angles or perspectives.

In September, UN-Habitat and the City of Johannesburg teamed up with Ericsson and Witswatersrand University to test a 'mixed reality' application for community participation as part of the upgrading of Eland Park in Braamfontein, South Africa. Over three days, students from nearby Rosebank College and Witswatersrand University worked with residents, passers-by and Faku'gesi Festival participants to use Minecraft to crowdsource and co-create design ideas to improve the park. The ideas from this workshop were varied and focused on making street crossings safe, pedestrianisation, increasing security and providing seating and activities for the hundreds of students who regularly use the space. Once the participants finished designing in Minecraft, the Ericsson team exported their creations to a mixed reality prototype application, building on a detailed 3D model of the public space. People could then go outside and, using special smartphones with 3D-sensors, view their Minecraft designs in real life, including walking around the digital objects out on the street as if they were physically present. An urban designer from Witswatersrand University interpreted the needs and ideas that people expressed through the Minecraft process and designed a first 3D proposal for improving the site. This could also be viewed through the mixed reality platform. In December, UN-Habitat was asked by the City to train City officials in the Block by Block methodology. A participatory public space mapping exercise in Diepsloot was also organised by UN-Habitat, the City of Johannesburg and Sticky Situations, an NGO specialising in citizen participation.

Yangon Raincraft: Engaging Local Communities for Climate Resilient Neighbourhoods

Another project that utilizes the Block by Block technology is the Yangon Raincraft program. The city of Yangon is one of the most vulnerable cities worldwide to climate change, suffering from widespread flooding during the monsoon while experiencing severe water shortages in the dry season. From 2019, a joint initiative of local and

international partners, the Yangon Htee City program, has promoted community participation in the creation of climate-resilient cities, by focusing on small scale, practical measures such as rainwater harvesting, drainage improvements, education, water quality monitoring, and mobile apps.

The combined impact of Covid-19 and political crisis necessitated innovation in the Yangon Htee City program's engagement with communities. One of these is the partnership with UN-Habitat and the Block by Block Foundation, under which the Yangon Raincraft Program was launched in July 2021, which allowed residents to learn from local and international experts about water and climate adaptation strategies, and develop and visualize their own solutions in virtual Minecraft neighborhoods.

The Yangon Raincraft program was set-up as a 6-week program covering key topics such as the natural and urban water cycle, flooding, water scarcity and climate resilience. At the end of the program, the participants had to deliver their own original "Master Plan", presenting their personal views on a climate resilient neighborhood. The results were extremely well received: not only did the teams present a well-developed range of measures and interventions to address flooding and water shortage, but they presented these as part of a holistic, integrated design that places high emphasis on people's wellbeing, featuring elements such as outdoor meeting spaces, sports and recreation activities and attractive landscaping.

Community-led City-wide Public Space Inventory and Assessment

The UN-Habitat City-wide Public Space Inventory and Assessment tool provides a flexible framework designed to aid local governments and partners working in public spaces to assess the network, distribution, accessibility, quantity and quality of their public spaces in a cost-effective way. The tool aims to determine priority areas and sectors of intervention – both spatial and non-spatial– that government and private entities can take to address them. Capturing data in the field usually means using paper, however, the city-wide public space inventory and assessment uses an open source application called Kobo Collect which allow the creation of a digital questionnaire form, fill it out on a mobile phone or tablet, store and view the aggregated information on a central server, and retrieve the aggregated data to one's computer for analysis. By using a smartphone or tablet, field data can be collected with all the advantages that electronic data gathering brings (value input control, skipping irrelevant sections, elimination of transcribing errors from paper, etc.).

The city-wide public space inventory and assessment tool has been widely adopted by cities. Since 2015, the tool has been regularly updated with feedback from its application in a variety of urban contexts. It has been applied in 34 cities and engaged approximately 1,750 data collectors with every city having different thematic entry points such as children, safety, markets, women, heritage, etc. Notably, during the COVID 19 pandemic, public and green spaces have become critical areas for containment, testing and in decongesting crowded markets. They offered the much-needed refuge where individuals can be out in public, while safely practicing social distancing measures such as having open gyms. Importantly, increasing green areas in urban areas is one of the possible solutions for reducing PM2.5 concentration. Cities reporting better air quality (as measured by PM2.5) before the pandemic observed lower COVID-19 death rates. More than ever, it has become critical for cities to understand the state of their cities in terms of the spatial distribution and quality of their public and green areas. Therefore, the guide to undertake city-wide public spaces inventory and assessment, has been revised and updated based on the input and experiences from these cities. Local governments and partners are encouraged to apply the guide fully or in part.

Through the application of the tool, 40 trainings to local governments, community members and volunteers have been conducted on the use of the tool but also the importance of public space and the need for data for policy and strategy development. Since the monitoring of SDG 11.7 and the public space commitments in New Urban Agenda are done at the city level, city-wide surveys of public spaces have been key to support local governments to report their progress towards achieving these commitments.

UNITAC project on Support to Informal Settlements Mapping in eThekweni, South Africa

UNITAC-Hamburg, the UN Innovation Technology Accelerator for Cities based in Hamburg, Germany, is a joint initiative of UN-Habitat, the HafenCity University of Hamburg and the UN Office of Information and Communications Technology (UN-OICT) and works with a variety of innovation, prototyping and applied research methodologies to develop solutions that accelerate the achievement of SDGs related to cities and urbanization. These innovative solutions will be tested and scaled through UN-Habitat's global network of country offices, local governments and other partners, including the private sector and the academia. In addition to UNITAC, UN-Habitat and partners have established an innovation lab, the 'Urban Pavilion', in Toronto, Canada, while two other are being advanced in Mexico and in Malaysia.

Due to continued and rapid urbanization, the city of eThekweni houses the largest number of informal settlements of any municipality in the country: estimated at 585 settlements comprising more than 320,000 households. Although the city has initiated a range of responses to address its informal settlements such as full-service housing projects and land management mechanisms, challenges in data management still persist. The data is outdated, and there is a lack of capacity to generate, capture and analyze data, along with other difficulties such as compromised service delivery and strategic decision making.

In response, the city has developed the Informal Settlement Information Management Solution (ISIMS) – a multi-year programme that looks to “facilitate improved collection, integration, and analysis of city-level data”, with the key objective of utilizing this information management solution as a planning tool. However, the information used to plan for upgrading and service delivery interventions is currently scattered throughout different departments and sometimes outdated as land monitors cannot keep track of the fast changes.

In order to ensure the city has accurate information about the number and location of informal structures and environmental constraints which could impact housing provision, the joint UNITAC project will develop a tool that uses machine learning to accelerate the spatial recognition of these settlements and structures on satellite imagery, enabling the automatic detection of informal settlements. This will generate up to date records and keep track of any changes to the built-up area or density, with higher frequency updates to resultant maps. The project will support the eThekweni Municipal Government departments to better target their upgrading and service delivery interventions.

UNITAC project on Support to Public Policy Observatory in Alagoas, Brazil

In Maceió, within the State of Alagoas, Brazil, roughly 25% of the population (250.000 inhabitants) lives in informal settlements, locally known as “Grotas” (quantified all in all at 78). Several urban challenges emerge from the Grotas, from a lack of tenure-security, basic infrastructure and public services to human safety with reportedly high rates of criminality being experienced in the city. There is also a data gap, with accurate and detailed information at municipal and community levels being expensive, unavailable or difficult to find, which in turn contributes to insufficient social participation, a national bias and low accountability. The inadequacy of traditional data sources and methodologies used by the city have been exacerbated by the Covid-19 pandemic, contributing to patterns of exclusion faced by women, children and other marginalized identities in Grotas.

In light of this, UN Habitat and UNITAC are working to support the establishment of an ‘Observatory of Public Policy’. This provides a permanent shared platform dedicated both to the production and analysis of data, information and knowledge, and to the promotion of evidence-based decision-making processes at all levels of governance, contributing to improved accountability, dialogue and transparency in policy making. This involves additional help with data visualization and storytelling to make data more accessible, improvement of the design and collection methods for data, and capacity building among policymakers and public and private stakeholders to improve understanding of data-analysis driven urban development. It also includes a toolkit on how to establish data labs for sustainable urbanization, for local governments.

4. Can you provide **examples of policies/projects/initiatives specifically aimed at strengthening national STI capabilities** to promote urban sustainability transition?

For frontier technologies and innovations to effectively contribute to urban sustainability, these need to be appropriately applied to ensure that the prosperity they bring is shared among citizens, cities and regions. It would require the creation of open, user-friendly and participatory data platforms that ensure that the benefits of data collection and integration is shared for the benefit of all with strong guidance on data protection, data ownership, privacy rights, and human rights in this context. To achieve this, a stronger stress on capacity building in local government and across the built environment professions is crucial to turn smart city plans and the use of frontier technologies in urban planning, design, and regeneration into concrete people-centred opportunities rather than tech-led endeavours. Ultimately, the deployment of frontier technologies and sustainable urban development needs to pay special attention to underserved populations, in order to address inequalities and to bridge social and spatial divides.

Smart City Rwanda Masterplan:

Rwanda is undergoing a process of transformation from an agrarian to a knowledge-based economy, in the context of an increasingly urbanized and digital world. Smart Cities will enable Rwanda to maximize the opportunities of digitization for better data-led management, planning, efficient community-based infrastructure and services and localized and shared innovation, to drive economic development and sustainability. The Smart Cities Masterplan is intended as a guide to help Mayors and urban managers go through the process of developing their own smart city strategies and masterplans, as well as providing a strategy for the government to promote the development of smart cities in Rwanda on a national level.

The masterplan is divided into 5 chapters. Chapter 1 identifies the ICT challenges of Rwandan towns and cities today. Chapter 2 defines ‘smart cities’ in the Rwandan context, using three models: the techno-logical model, the strategic model and the collaborative model. These ensure Rwanda makes use of flexible and scalable solutions, that create improved and more accessible services. Chapter 3 provides a ten-step plan for national governments and local authorities to prepare the strategic action plan and stakeholder partnership team for potential smart cities. Chapter 4 sets out the smart city action plan itself, with comprehensive guidance on how to implement smart cities at the national and local level. Chapter 5 connects the Rwanda Smart City Masterplan to the wider smart city vision for Africa.

The Masterplan is not a “one-size-fits-all” plan, but call for evaluation, prioritization and fine tuning to ensure that it meets the dynamic and changing nature of Rwandan towns and cities. The recommendations found in this document, along with the Smart Africa Alliance’s Smart and Sustainable Blueprint for Africa, can be used to provide guidance for future national and local smart city masterplans throughout the continent.

Digital Governance Labs:

Technology and innovation can provide tools and alternatives for urban governance systems, increasing public participation in, as well as transparency and accountability for, governing systems. Indeed, recent advances in digital development in the world in general, and in Least Developed Countries, Landlocked Developing Countries and Small Island Developing States in particular, offer many opportunities to use technology as a lever and main tool to improve urban governance systems

that are essential in building more sustainable human settlements. Such regions, however, also face challenges to harness the potential of digital technology, which impacts the ability to connect people to the decision-making process and to effectively manage public services.

The digital urban governance labs, established in these three regions, will accelerate digital transformation and improve local governance systems. The project focusses on co-producing solutions locally through participatory processes, especially for women and youth; long-term capacity building and the creation of physical urban governance labs; the production of data frameworks, national and local policies, and strategic action plans to promote people-centred smart cities.

Example: Cameroon Digital Urban Governance Lab:

UN-Habitat recognizes the role of local communities and governments in achieving sustainable development through innovative approaches and solutions. Through the flagship program “People-focused smart cities” UN-Habitat ensures that the deployment of technology and innovation is used to ensure sustainability, inclusivity, prosperity, and human rights in cities.

This Digital Urban Governance Lab is aligned with this vision and aims to support Cameroonian cities to move forward with their digital transformation for better urban governance while empowering youth and making them actors of change. Moreover, the Digital Urban Governance Lab comes in line with the joint actions of UN-Habitat and the Government of Cameroon in their commitment to build more resilient, inclusive, and sustainable human settlements through the use of technology and innovation. It aims to create a dynamic among young people and innovators around the use of digital technology in improving urban governance while providing to cities leaders solutions that can help them meet the challenges facing their cities and improve the quality of urban life.

The Lab is a center of reflection dedicated to innovation, ICT, and technologies to improve urban governance in Cameroon cities through digital-based solutions. It intends to enlighten the various actors on the opportunities of a digital market based on the technology at the service of Cameroonian cities. It is also a matter of constituting a think tank that will support cities across the country in their digital transformations through innovative solutions, policies, strategies, action plans, etc. This laboratory will also be connected to other Labs in other cities to create an interconnected network in order to share information, data, solutions, learn from each other, and capitalize on achievements.

Digital Rights Helpdesk:

The protection of human rights in the digital space is critical now more than ever as there is increased reliance on the internet and digital technologies continue to transform the means through which human rights are both exercised and violated around the globe.

This project is a collaboration between UN-Habitat and Cities Coalition for Digital Rights (CC4DR) which will provide a technical and policy related support service to help local governments address inclusion and human rights as part of their digital strategies by providing specific and tailored advice. The Helpdesk will be a platform that brings together experts and communities from various cities and provides them with key resources.

The Helpdesk will be structured in a manner that allows its services to be customized, depending on the needs and level of maturity of the city in terms of digital human rights. It will have four dimensions, which can complement each other or be delivered independently. The first dimension involves a team that can work closely with a city for one or two weeks, virtually or in presence. Two other dimensions are based on expertise support, such as capacity building programs which include an FAQ structure, and a booking system to moderate consultation between the city and communities with experts in the area. The last dimension is based on knowledge-sharing events, forums and other opportunities for cities working with the Digital Rights Helpdesk to learn with each other, as well as for citizen's advocacy and deliberation.

5. Could you share **case studies of regional and international cooperation that have strengthened STI capacities of developing countries** in dealing with urban sustainability transition?

Climate Smart Cities Challenge

The Climate Smart Cities Challenge (CSCC) is a city-based open innovation initiative that invited technologists, businesses and investors to develop, test and scale cutting-edge solutions in a specific city or set of cities to reduce greenhouse gas (GHG) emissions. Four cities were chosen: Curitiba (Brazil), Bogotá (Colombia), Bristol (UK) and Makindye Ssabagabo (Uganda). The programme focusses on specific climate challenges in cities that have the potential to reduce GHG emissions and have a positive social impact, in three sectors that are the most significant contributors to GHG emissions in cities: transport, housing and the built environment. These challenges range from freight logistics management to green and affordable residential buildings.

The project specifically addresses the difficulties faced by local governments when working with stakeholders such as the private sector, where institutional bottlenecks, inefficiencies and a lack of innovation in procurement, stakeholder engagement and resource mobilization can arise. UN-Habitat provides flexible support to local governments on these issues, through challenge definition, conceptualising innovation and identifying innovators, and stakeholder and community engagement. Learnings and experiences documented throughout the challenge enhance the mechanisms used by the city to develop and implement partnerships and technology that are people centred.

Her City

The pandemic has disproportionately impacted the lives of the most vulnerable groups. For women and girls, lockdowns and quarantines have led to an increase exposure to domestic violence and a disproportionate domestic workload including home schooling. At the same time, the importance of public space for mental health and wellbeing has been highlighted by the pandemic, as has its uneven distribution across cities. Research shows women and girls worldwide feel unsafe and unwelcome in public spaces, increasing the need for digital tools which enhance participation in public space development and make public spaces safer and more inclusive for all.

[Her City](#) is a digital participation toolbox to promote gender responsive urban planning and design during the COVID-19 pandemic. It is a joint initiative between UN-Habitat and the Swedish think tank

Global Utmaning, In partnership with the Swedish Innovation Agency, the Block by Block Foundation, White Architects, the Swedish Union of Tenants and MethodKit. Her City platform gathers a range of planning and design tools to ensure gender equality in the development of public space and urban project. Through assessment, design and implementation approaches, it enables the engagement of women and girls to drive planning processes to develop safe, inclusive and accessible public spaces.

Her City uses innovative solutions to promote digital participation for urban development. Women and girls are taking a leading role and shape better cities that are beneficial for everyone. Digital tools such as online questionnaires, collaborative online platforms and smartphone applications, enable the project manager to reach a larger group of stakeholders, analyse data and co-design virtually during COVID-19.

The toolbox currently has over 750 registered users from 250 cities in 90 countries. Lesson and experiences from stakeholders prove how innovation enables governments to improve cities in a sustainable and inclusive manner even during periods of pandemic, crisis or emergency. Yasmeen Dinath, urban planner at the Johannesburg Development Agency says, while discussing the upcoming project in the informal settlement of Diepsloot: “We are determined to do things differently in Diepsloot, with an all-female project and building a team to work with the real experts. That’s the girls!”

Regional guidance on policies and actions: Example of the Report on the State of Sustainable Urbanisation in ASEAN 2021

An essential part of UN-Habitat’s mandate is to develop and agree on global and regional normative guidance and standards to support governments’ shift to sustainable urban development pathways and respective **policies**. UN-Habitat reports on the state of cities and urbanization and emerging trends in the main regions and subregions of the world are central in knowledge production and sharing. For example, UN-Habitat is currently cooperating with ASEAN² to publish an ‘Report on the State of Urbanisation in ASEAN 2021’ to promote the development of sustainable, liveable and inclusive cities in the subregion by showcasing key principles and practices for local governments and municipalities wishing to foster sustainable development. The Report is part of implementing the ‘Accelerating the Implementation of the ASEAN Sustainable Urbanisation Strategy’ (ASUS) **project** that includes activities at the city level to provide technical support to eight small- and medium-sized cities on issues ranging from public transport and big data to solid waste management, while regional level initiatives, such as the ASEAN Sustainable Urbanisation Forum, provide an opportunity to engage with key stakeholders to discuss urbanisation issues in the region.

6. Could you suggest some **contact persons responsible for projects/policies**, related technologies and international collaboration in this context as well as any experts dealing with projects in this area? We might contact them directly for further inputs or invite some of them as speakers for the CSTD inter-sessional panel and annual session.

² ASEAN member states are Brunei-Darussalam, Cambodia, Laos, Malaysia, Myanmar, Indonesia, Philippines, Singapore, Thailand and Vietnam.

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