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Contribution by UNIDO

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

PRIORITY THEME 2: STI for sustainable urban development in a post-COVID world

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

To Whom it May Concern,

The 24th CSTD annual session selected "STI for sustainable urban development in a post-COVID world" as one of the priority themes for its 25th session (2021-22 period). This theme addresses SDG 11 on sustainable cities and communities.

Urbanization is a complex megatrend touching on various issues including economic transformation, environmental sustainability, inclusion and poverty eradication, and resilience to natural disasters, climate change, and public health emergencies like the COVID-19 pandemic. Cities also play a central role in shaping innovation and technological diffusion. In addition, peri-urban areas present increasing challenges in terms of poverty, sustainability, mobility, and economic performance. The 19th CSTD explored innovation and urban development in 2016. Since then, accelerating technological change and its deep impact on issues such as urban planning and management, critical systems' resilience, and citizen and community involvement make it advisable for the CSTD to update its findings and to examine and share emerging good practices and consider the latest trends in science, technology and innovation that can contribute to greener, more resilient, and more inclusive cities, particularly in light of the knowledge gained in developing innovative responses to the challenge of COVID-19.

The CSTD secretariat is in the process of drafting an issues paper on the theme to be presented at the CSTD inter-sessional panel meeting on 17-19 November 2021. In this context, we would like to solicit inputs from international organizations, UN entities and agencies, and regional commissions on this theme. We would be grateful if you could kindly answer the following questions based on your organization's work at the global, regional, and/or national levels.

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?

- ***Issue Paper - Rethinking City-to-City Partnerships under the 4th Industrial Revolution***

Developed jointly with EUROCITIES, the paper investigates how bilateral and multilateral partnerships among cities may have a positive impact on cities' efforts to achieve their development goals, as well as those set in the 2030 Agenda for Sustainable Development. The paper aims to be an agile guide for urban stakeholders to understand the benefits of cooperation among cities, providing successful examples and suggestions useful to overcome some of the common bottlenecks hindering city-to-city dialogue.

- ***Sample Project - Energy Efficient and Low-Carbon Transport in South Africa:***

The goal of this project is to promote the widespread use of EVs and non-motorized transport (NMT) in order to reduce emissions, congestion and environmental pollution
In addition to updating policies and regulations and installing EV infrastructure, this project contains an awareness raising and knowledge sharing component, to introduce the ideas of sustainable transport to other cities across South Africa

- ***Sample Project -Sustainable Cities: Integrated Approach Pilot in India:***

Another project under 'Sustainable Cities', the pilot project in India hopes to lessen the negative effects of rapid urbanization through sustainable urban planning strategies
This project combines the introduction of sustainable city planning and the development of renewable energy solutions with a partnership component in order to raise awareness of green technologies and promote the 'Sustainable Cities' program

- ***Sample Project - Integrated Adoption of New Energy Vehicles in China***

The objective of the project is to facilitate and scale up the integrated development of New Energy Vehicles (NEVs) and Renewable Energy (RE) in China.

This project has four components: policies and programmes, institutional capacity building, piloting technical measures, and aware raising, and engages in actions such as technology demonstration and exchange and promotion of NEV technology among manufacturers, suppliers, and consumers

- ***Resilience Framework for Projects along the Belt and Road***

Organized jointly with AIG and Wood, the Business Roundtable organized during the event resulted in an agile framework which sets the basic steps necessary for the implementation of resilient project at urban level.

UNIDO is supporting countries in jointly addressing their urban and industrial development challenges, through its work in fostering sustainable cities. The global development agenda advocates in Sustainable Development Goal (SDG) 11, the need to "make cities and human settlements inclusive, safe, resilient and sustainable" while UNIDO's mandate of realizing Inclusive and Sustainable Development (ISID) is an integral component of SDG 9 to "build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. ISID also reinforces the importance of linkages between interdependent development goals; known as the "nexus-approach".

Within the focus area of "industrialization", the industrial sector has been characterized as:

1. Requiring input factors such as energy, which like any other scarce resource, needs to be conserved and consumed more efficiently,
2. Producer of commodities, and while doing so, should aim at "long-term efficiency and productivity gains in all its processes, contributing to safeguarding the environment, mitigating climate change, and advancing sustainable production and consumption"; and,
3. A source of technology and knowledge exchange. For industry to thrive, it relies on an enabling business environment, including functioning cities and infrastructure, a stable legal framework and non-violent societies.

Sustainable and inclusive industrialization of cities provides opportunities for developing synergies, such as decoupling economic growth from environmental degradation, while at the same time creating employment. Cities benefit from the role of industries in local economic development through job creation and income generation. In industry also lie critical solutions towards limiting the carbon intensity of growth, considering the impacts of its activities as an energy consumer (and in some cases energy producer), major freight transport user, promoter of efficiency and clean energy technologies and solutions, preserver of green cover and implementer of sustainability initiatives. A sustainable city serves the best interests of industry as it benefits from the efficient and peaceful functioning of its host cities.

Benchmark projects/programs include:

- Sustainable-city Development in Malaysia
- Sustainable Cities Integrated Approach Pilot in India
- Climate Change, Clean Energy, and Urban Water in South Africa
- Integrated adoption of New Energy Vehicles in China
- Sustainable cities initiative for Senegal
- The Abidjan Integrated Sustainable Urban Planning and Management

Key challenges encountered in implementing the aforementioned:

- Lack of correlation between policies and planning frameworks across different levels of government, i.e. national, state and local
- Challenges related to provision of infrastructure and services due to limited municipal financing capabilities and dependence on funds transfer from national/state government
- Lack of capacity to support implementation best available technology
- Lack of the necessary policy, regulations and incentive programmes to encourage investment in smart cities by the private sector, despite interest from government institutions;
- Lack of information about the factors that the creation of a sustainable city entails and limited capacity to introduce these technologies and measures; limited awareness also hinders the development of demand for such cities by the general public and businesses
- Lack of the necessary supporting infrastructure: service/equipment providers, support applications, maintenance, etc.

UNIDO is also promoting sustainable urban development through better-integrated models of urban designs, planning, and implementation; examples of such landmark projects in UNIDO include inter alia the below mentioned:

The Department of Environment - Resource Efficiency and Pollution Mitigation Divisions are promoting sustainable cities through the integration of circularity, pollution mitigation and efficient use of resource in cities. Benchmark projects/programs include:

- EU4Environment program supporting resource efficiency and cleaner production in cities;
- Plastics value chain management, global recycling, green and circular economy programs across Africa, the Balkans and Latin America (Algeria, Egypt, South Africa, Ukraine, Serbia, Peru, Columbia, Paraguay etc.)
- The Abidjan Integrated Sustainable Urban Planning and Management

Concurrently, the Department of Environment is supporting counties transition to urban sustainability and greener cities through ensuring that strong legal frameworks are in place to promote sustainable cooling in cities, reducing the emissions of Ozone Depleting Substances ODS and advancing cleaner productions with GHGs accountancy. UNIDO's Department of Environment is also very proactive in building and forming of synergies in industrial zones through Eco-industrial parks logistics planning and managements programs.

Key challenges encountered in implementing the aforementioned:

- Lack of policies (the implementation of policies, where available), and pre-existing conditions that foster the smooth transition
- Challenges related to retrofitting existing infrastructures into more efficient uses of materials, energy and adopting clean cooling technologies
- Challenges underpinned by lack of capacity during technology transfer

UNIDO's strategy for sustainable cities and UNIDO urban-industrial programmes such as the Bridge for Cities programme, urban energy projects and support to Eco-Industrial Parks, put strong emphasis on incorporating gender dimensions and to ensuring that women and men can equally access, participate and benefit from sustainable urban-industrial development. This includes increasing women's representation and participation in decision making processes, identifying women industry and business associations as partners, and ensuring approximate gender parity among beneficiaries.

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?

The COVID-19 pandemic is, at the surface, a health crisis, but it has rapidly escalated into a series of socioeconomic challenges in a world interconnected by cities. The socio-economic crisis triggered by the lockdown measures has further exacerbated existing challenges in many cities, including pollution, poverty and inequality, the urban financing gap, and governance-related issues. The pandemic however provides a unique window of opportunity to Mayors, local representatives and urban stakeholders to build back better and to realize resilient, inclusive, gender-equal and green economic recovery for the advancement of the SDGs.

Within the context of cities, impact of the pandemic on mineral and material supply chains has caused major disruption on cities capital investment plans. Addressing this challenge, accelerated digitalization of industry has provided a solution by encouraging more localized production and customization, thus shortening value chains and reducing supply chain risks for businesses.

The global COVID-19 outbreak is putting an immense strain on societies and economies of countries around the globe. Major disruptions are being felt across economic and social sectors, in an already fragile world economy. As the COVID-19 pandemic continues to unfold and health concerns remain paramount, cities are already taking the first steps towards recovery and leading calls for a green and just recovery.

The pandemic also highlighted the importance of ensuring more equitable access to key services.

Major opportunity for cities to invest in retrofitting

The ability of nature-based solutions to significantly improve local air quality is particularly relevant, given that evidence now suggests that prolonged exposure to poor air quality exacerbated the health impacts of COVID-19.

The pandemic has given a boost to initiatives embracing the value of growing local, organic and more seasonal food in and around urban areas. Policies to promote local food production will need to consider its affordability for lower-income households, which often lack access to sufficient healthy food and fresh produce.

Efforts to recover from the impact of the pandemic provide an opportunity to advance momentum towards carbon neutrality, building greener, more sustainable economies.

The pandemic has influenced sustainable urban development by affecting multiple disruptions in the mineral supply chain thereby causing scarcity of building and construction materials.

UNIDO as an industrial organization through its Inclusive and Sustainable Industrial Development ISID approach recognizes the importance of the urban development in building, construction and urban facilities.

Lessons learnt from Covid-19 impact on sustainable urban development highlight the need to encourage the building and construction industry to explore more innovative, sustainable pathways through the utilization of alternatives building materials, and maintain high performance standards in buildings in revolutionizing urban development.

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?

Thematic projects in UNIDO Department of Energy that relate to addressing urban sustainability and are driving green technology innovations at city scale have been organized around following:

- Urban mobility, energy and resource efficiency systems
  Through its global forums and technical cooperation projects UNIDO takes a lead role in the promotion of sustainable technologies to complement the ongoing work of programme partners on sustainable planning and investment. The utilization of green technologies such as renewable energy that generate green electricity, smart grid systems that connect the electric vehicle charging stations to the grid to efficiently supply electricity, and electric vehicles that reduce carbon emissions sharply by using green electricity, ensure the highest impact for city-level climate action and fosters green development as well as innovation.
- Creating innovations by learning: implementing pilot demonstrations and fostering innovations via replications and scaling up based on lessons learnt.
  Through the demonstration projects, UNIDO showcases techno-economic feasibility of technologies available for increasing energy security and reducing environmental impacts and paves the way for clean energy innovation, decreasing costs of mitigating measures, and, future replication and scale-up.
  At the city level, UNIDO demonstration projects are strategically integrated into mixed use city neighbourhoods, in order to produce not only better economic performance but create easily accessible and safe working environments, healthy surrounding neighbourhoods, and no negative impacts on the natural environment.

As part of the project titled “Sustainable-city Development in Malaysia” UNIDO is focusing its interventions on adoption of renewable energy (RE) integrated smart grid facilitated through demonstration activities of distributed RE systems, solar-powered EV charging facilities, battery energy storage, EE and RE applications in buildings and ICT system. The project will demonstrate an integrated package of technologies and involve interventions to assist Melaka in carrying out and facilitating investments which will reduce GHG emissions and enhance the effectiveness, efficiency and safety of their technical and industrial systems and processes as well as transportation modes – with potential scale up to other cities. Industrial and technical systems, as well as transportation modes will be

strategically integrated into mixed use city neighbourhoods, so as to produce not only better economic performance, but also create easily accessible and safe working environments, healthy surrounding neighbourhoods, and no negative impacts in the natural environment. The outcomes of the demonstration projects will be closely monitored and will inform improvement/development of the national and state policies and strategies for development of sustainable and resilient cities.

Thematic projects or events in UNIDO Environment Department that relate to addressing urban sustainability include a project, through The Montreal Protocol Division, to establish a Cold Chain Innovation Hub in the Philippines. Through promoting technology transfer and some Industry 4.0 principles (VR trainings, block chain: tracking the temperature and energy use during transportation of cold chain trucks), the hub aims at reinforcing partnerships among key stakeholders of the RAC industry by providing the opportunity and contributing towards changing the cold chain sustainably.

- ***The "BRIDGE for Cities" initiative***

UNIDO plays a key role in promoting new norms and standards related to the development and use of sustainable and integrated technologies and in undertaking any supporting research necessary to back up the implementation and success of Industry 4.0 technologies and solutions at the city level. UNIDO launched the "Bridge for Cities" initiative in 2016, which is an annual city-to-city partnerships forum for cities along the Belt and Road and beyond. The initiative promotes the implementation of the 2030 Agenda for Sustainable Development via the Belt and Road Initiative, with which it shares many similarities, and encourages municipal officials and development stakeholders to scale up their engagement in inclusive and sustainable urban-industrial development. Against this backdrop, BRIDGE for Cities 4.0 will explore also the role of the Fourth Industrial Revolution in fostering urban innovation in cities along the Belt and Road and beyond.

As COVID-19 has exposed the urgent need to restore the balance between people and nature, including the rising importance of cities and sustainable urbanization and the correlation between innovation and the sustainable urban-industrial development, this forum offers a great scene for international dialogue between Mayors and facilitates exchange of best practices. This year's sixth edition will focus on how cities are advancing recovery and building resilience in the context of the COVID-19 crisis.

Mayors from across the world, both developed and developing countries have implemented innovative solutions to respond and recover from the pandemic, and it is therefore important to provide them with a platform, like Bridge for Cities, to exchange knowledge, concrete actions and success stories.

The main challenge was to ensure that the Bridge for Cities becomes more developmental by reaching out and securing the involvement of cities and stakeholders from developing countries, especially those participating in the Belt and Road Initiative. There is a particular need to target and involve Tier 2 and Tier 3 cities from those countries. These Tier 2 and Tier 3 cities can be expected to receive the greatest benefits from participation in the initiative by gaining access to UNIDO's technical expertise and establishing new and stronger ties with cities and regions that face similar challenges, or can provide solutions to those challenges based on their own experiences. Cities in developing countries are in many cases the ones which directly face the threats deriving from global warming, urban sprawl, pollution and unemployment, and they are the places where social and economic unbalances are most striking. They are also the ones which find it most difficult to tap into international solutions due to budgetary constraints and remoteness.

- ***Issue Paper #5- Re-thinking City-to-City Partnerships under the 4th Industrial Revolution***

Developed jointly with EUROCITIES the paper investigates how bilateral and multilateral partnerships among cities may have a positive impact on cities' efforts to achieve their development goals, as well as those set in the 2030 Agenda for Sustainable Development. The paper aims to be an agile guide for urban stakeholders to understand the benefits of cooperation among cities, providing successful examples and suggestions useful to overcome some of the common bottlenecks hindering city-to-city dialogue.

- ***Sample Project Energy Efficiency and Low-Carbon Transport in Malaysia:***

The objective is to introduce and increase the widespread use of electric vehicles in order to reduce carbon emissions and increase green technology usage. The project works on both a policy level, developing regulatory frameworks and increasing capacities, and a technical level, designing and installing EV infrastructure and encouraging local EV manufacturing

- ***Sample Project Sustainable Cities Management Initiative for Senegal:***

This initiative works to aid in the development of sustainability-focused urban planning strategies and to integrate climate risks and responses into city infrastructure. In Senegal, this project hopes to increase cities' resilience to climate events and introduce green technologies and renewable energy projects to Diamniadio eco-industrial city and the Greater Dakar area

- ***Sample Project Strategic Platform to Promote Sustainable Energy Technology Innovation, Industrial Development, and Entrepreneurship in Barbados***

Many developing countries lack private sustainable energy enterprises capable of providing products and services long-term, resulting in unstable markets, limited job opportunities, and high reliance on fossil fuels. This platform aims to strengthen these industries in Barbados through coherent policy and incentive frameworks as well as increased investment in and promotion of sustainable technology companies

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

Not Applicable

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?

During the last two decades of the twentieth century, cities have become active participants in international relations as never before, mainly through extensive programmes of twin/sister cities and the formation of networks of cities. Facilitating City-to-City partnerships is one of the main objectives of the Bridge for Cities initiative. For example, in Bridge for Cities 2019, a matching-making session between Shenzhen, China and Phnom Penh, Cambodia saw an exchange of letters of cooperation between both cities to reaffirm their commitment for development of smart cities.

- ***The "BRIDGE for Cities" initiative***

UNIDO has developed the "BRIDGE for Cities" initiative, which aims to provide local governments and urban stakeholders with a platform to discuss and share experiences useful for the achievement of the SDGs and the New Urban Agenda, in the spirit of city diplomacy.

- ***EUROCITIES***

EUROCITIES, the network of major European cities, has worked for more than thirty years to network with and facilitate the exchange between European cities, to promote the urban agenda to international organizations and to facilitate the exchange of knowledge and good practices between cities in general

- ***URBAN-EUCHINA***

URBAN-EUCHINA project looked at the steps taken by the most successful city-to-city partnerships between Europe and China.

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.

Some of the city networks, which partnered with UNIDO for Bridge for Cities, could be contacted for more information on international collaboration among cities, such as ICLEI and EUROCITIES.

- Mr. Marco Kamiya - Division Chief - Innovation and Digitalization Division UNIDO

Please send your responses and any further inputs on the theme to the CSTD secretariat (stdev@unctad.org) by 6 September 2021. We look forward to receiving your valuable inputs.

Sincere regards,

CSTD secretariat