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Contribution by Egypt

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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Priority Theme 2: STI for sustainable urban development in a post-COVID world

1. What are the concrete challenges that your country has encountered in transition toward sustainable urban development to make cities productive, inclusive, and livable?

Over the last 50 years, Egypt's efforts to accommodate its population growth comprised of expanding new cities into the desert. With more than 40 new cities developed, almost 43.1% of Egypt's population live in urban areas. Large metropolitan areas like the Greater Cairo Region (GCR) and the city of Alexandria account for 56 % of the urban population alone.

With the current population presently at 100 million, and estimated to reach 140 million by 2050, demand on urban infrastructure and services is soaring. Rural inhabitants impoverished by lack of jobs and economic opportunities, increasingly settle in unplanned and sometimes unsafe rural areas. In 2011, the Ministry of Local Development (MOLD) estimated that more than 15 million inhabitants lived in 1171 unsafe areas, thus, turning them into prime sources of poor hygiene, crime and social unrest. This fast-paced urbanization stretched the already aging infrastructure, public services and transportation systems to the limit, negatively affecting their quality and causing severe environmental damages.

In 2016, the Ministry of Planning and Economic Development (MPED) launched "Egypt Vision 2030" national agenda for sustainable development. The Vision aimed for a better spatial management of lands and resources to accommodate the population and improve their quality of life. It also highlighted the need for improved legal frameworks, knowledge, capacities and governance to address the challenges in urban areas and promote sustainable urban development in Egypt. Additional efforts were needed to address the construction violations, loss of arable land and unplanned settlements and slums that spiraled during periods of political unrest. The Government of Egypt (GoE) responded by boosting investments in infrastructure upgrade, human development, and the knowledge economy, with the constant test of pacing it faster than the rapid urbanization growth.

2. How has the COVID-19 pandemic so far imparted on sustainable urban development and what lessons could we draw from the COVID-19 pandemic on sustainable urban development?

Egypt had taken long strides in upgrading its digital connectivity prior to the Covid-19 pandemic. The GoE dedicated more than USD 1.6 billion since the mid-2018s to modernize its digital infrastructure. This included replacing copper cables with fiber optics and investing in 5G infrastructure with an eye towards increasing internet access and speed. E-Government was already underway when the Covid-19 pandemic hit the world. This allowed Egypt to stand the test of lockdowns and curfews with minimal damages to its economy and livelihoods in urban and rural settings.

The un-interrupted supply of basic goods (particularly food and pharmaceutical products) during the peak of the pandemic in 2020 was marked by a sharp increase in e-commerce, fintech and digital payments, standing proof that technology and digitalization had become a key component of the Egyptian economy. Telecommunications infrastructure was able to withstand the added

pressures of working from home and an increased reliance on e-learning, voice-over IP applications and other online services during periods of lockdown and curfews.

Megaprojects contributed to cushioning the negative impacts of the COVID-19 pandemic on the Egyptian economy, creating a plethora of opportunities as the projects involved 1,000 companies and nearly two million Egyptian workers. The housing projects alone managed to secure 800,000 job opportunities for youth. Furthermore, the majority of the megaprojects were lucky to be in sectors comparatively less affected by the pandemic with 32% on Housing and 27% on Transport compared to just 3% in Tourism, a sector highly affected by the pandemic.

3. What projects/policies has your country implemented to use science, technology, and innovation to make cities productive, inclusive, and livable? What are the main outcomes? What are the main challenges confronted while trying to implement these projects/policies?

Egypt began its efforts to construct 22 fourth-generation cities in 2018. These cities are intended to satisfy the growing population's need for sustainable cities, and offer housing, investment and job opportunities. The GoE relied on technology and digitalization to make them productive and sustainable. Cities, such as the New Administrative Capital and the New city of Al-Alamein boast building using FTTX technology, smart utilities to reduce consumption and cost, renewable energy for a green environment, traffic monitoring systems to manage congestions and accidents. The new cities are connected through high-speed trains, fully automated and driverless Monorail lines that will curb Egypt's carbon footprint, in addition to the existing railway network, currently undergoing a modernization plan of its coaches and safety measures through automated signalling systems.

Egypt is currently constructing 26 new electricity stations with a total capacity of 26,000 MW. Electricity produced through solar energy increased from 0.529 billion KW to 1.465 billion KW between 2018 and 2019, (increasing by 177%) as Egypt inaugurated the Benban Solar Park, the world's largest solar park. In the coming years, Jabal El-Zeit power plant will become the largest wind power plant in the MENA region and will increase Egypt's wind energy capacity by 18%. In parallel, work is ongoing to strengthen the transmission network by adding, replacing, and renewing overhead lines, transformer stations, and smart grids to maximize the efficiency of electricity usage, monitor performance and anticipate problems.

As negotiations over the Grand Ethiopian Renaissance Dam continue to hit a wall, the GoE bumped investments in water projects to increase its water resources and rationalize its use through modern irrigation systems and water-saving techniques. Currently, 52 wastewater treatment plants are under construction in Upper Egypt, with a capacity of 418 million m³ per year. The percentage of treated wastewater to total wastewater reached 68.7% in 2019. Egypt will host the largest wastewater treatment plant in the world (Bahr al-Baqar water station) with a capacity of 5 million m³ per day. Treated water from the plant will be used to cultivate and farm around 342 thousand acres as part of the Sinai Peninsula Development Plan. The lining of irrigation canals that started in 2020 is expected to save 5 billion m³ of water per year, whereas, the 58 desalination plants currently being constructed have a combined capacity of 440,000

m3 per day, and a further 39 desalination plants are under construction to serve the new coastal cities.

The government is also planning to complete the construction and operation of nine digital universities. As the pandemic pushed the Education Ministry and Higher Education Ministry to administer major exams online, additional investments are going towards providing 600k tablets for school students and digitizing 154 examination centers in universities.

- 4. Can you provide examples of policies/projects/initiatives aimed at strengthening national STI capabilities for sustainable urban development? For example, how does your country build technology and innovation capabilities through investments in R&D and human capital? What institutional and regulatory arrangements are in place to stimulate R&D and innovation and to effectively address unintended consequences of technological innovation, such as privacy, ethical, gender, and other concerns?**

The numbers of students, universities, faculties, faculty members, published academic papers and university hospitals have been growing since 2014, in tandem with public and private sector spending. The budget of the Ministry of Higher Education and Scientific Research increased by 160% since 2014 and the private sector is demonstrating a growing interest in investment in higher education. As a result, Egypt currently boasts 36 private universities and technical, up 100% from 18 in 2014, with a more diversified portfolio of faculties. The number of faculties in those universities also doubled to a total of 264, compared to 132 in 2014. Private academies rose 9% between 2014 and 2021, reaching a total of 172. Today, there are several faculties and specializations that cater to the workforce of tomorrow such as motorsports engineering and computer games development ; nuclear power stations engineering ; and ethical hacking and cyber security.

The Egyptian Knowledge Bank (EKB) is another initiative that aims at developing the national STI capacities. The EKB initiative was announced on Science Day in 2014 by the Egyptian President with a full access launch in January 2016. EKB is an online library archive and resource that provides access to learning resources and tools for educators, researchers, students, and the general public of Egypt. The initiative collaborates with over 26 regional and international publishing houses to spread the culture of knowledge and learning, and put a spotlight on the value of research. EKB grants all Egyptians from all ages access to the largest amount of knowledge, cultural and scientific content whether they are basic, applied, technology, human or management sciences. It also includes public cultural books that target children and could be used through computers, smartphones, and tablets around the country.

- 5. Could you share case studies of regional and international cooperation that helped your country in strengthening STI capabilities? Can you provide success stories in this regard?**

Partnerships with the private sector are key to the integration of technological solutions in the national sustainable urban development plans. Three electricity stations were built in partnership with Siemens AG providing a massive total capacity of 14,500 MW, while the Benban power station, also constructed in cooperation with the private sector, is “expected to avoid 2 million

tons of greenhouse gas emissions a year” according to the IFC World Bank Group. In partnership with the Russian Company Rosatom, the GoE is working on the construction of a nuclear power plant in Al-Dabaa in Matrouh Governorate.

Covid-19 pandemic brought new dimensions to partnership, when Assiut Cement Company (CEMEX) came out with a novel idea to help minimize the spread of COVID-19. The company developed an engineered disinfection solution that caters for widespread areas through modifying a stationary industrial fog canon and fixing it on mobile equipment. In coordination with Assiut Governorate, CEMEX disinfected the roads and alleys of Assiut thus limiting the spread of the pandemic. Activities were performed in presence of representatives from CEMEX’s Operations, Safety & Security departments to ensure the process is safely carried out.

In higher education institutions, internationalization is considered a core policy to strengthen STI capacities and increase in-country expertise. Encouraging foreign institutions to open branches in Egypt and pairing Egyptian institutions with foreign ones is a sure way to build national capacities in STI. New universities seeking licenses in Egypt must therefore form academic partnerships with foreign universities, offer at least some of the degrees and curricula of the partner university, and include study-abroad provisions for Egyptian students. Regulations stipulate that partnerships can only be formed with foreign universities ranked higher in global indices than the highest-ranked Egyptian university.

6. Could you suggest the contact person(s) of the nodal agency responsible for projects/policies or international collaboration related to the theme? We may contact them for further inputs.

Suggested contacts from:

Ministry of Planning and Economic Development:

Dr. Cherine Khallaf – Head of the Central Department of Trade and Industry

Cherine.khallaf@mped.gov.eg

Ministry of Higher Education and Scientific Research:

Dr. Yasser Rafaat Abdel Fattah – Deputy Minister for Scientific Research