

**Economic and Social Commission for Western Asia (ESCWA)****Report****Online Training Webinar on “Addressing the Water-Energy-Food (WEF) Nexus in the Context of Climate Change and Sustainable Development”**

*VOL. IV: Water, Energy and Food in the City of the Future (Smart Cities)*

*The Role of Technology Innovation and Smart Technologies*

**22 October 2020**

**Summary**

The European Union and the Gulf Cooperation Council (EU-GCC) and the Environmental Center for Arab Towns (ECAT), in association with the UN Economic and Social Commission for Western Asia (ESCWA), the Middle Eastern Desalination Research Center (MEDRC), the Swedish International Development Cooperation Agency (Sida), and the Embassy of the Kingdom of the Netherlands in the UAE organized an online training webinar on 27 October 2020 titled “Addressing the Water-Energy-Food (WEF) Nexus in the Context of Climate Change and Sustainable Development” on “Vol. IV: The Role of Technology Innovation and Smart Technologies”. The webinar covered the development of smart cities through technology innovation to support the WEF Nexus, economic growth, and sustainability of global markets.

The webinar enabled the participants representing various institutions to engage in constructive discussions focused on the development of smart cities analysed through the WEF Nexus perspective. This also allowed the participants to gain a deeper understanding of the advantages and disadvantages in implementing Information and Communication Technologies (ICT), urbanization, and the Internet of Things (IoT).

The webinar concluded with a series of recommendations that address the challenges faced in considering the implementation of smart cities in the water, energy and food sectors. Some key recommendations all speakers agreed upon included the use of ICTs and the IoT in an efficient manner to improve the quality of life, efficiency of urban operations and to address the needs of present and future generations with respect to economic, social, environmental and cultural aspects.

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## **I. Introduction**

1. The European Union and the Gulf Cooperation Council (EU-GCC) and the Environmental Center for Arab Towns (ECAT), in association with the UN Economic and Social Commission for Western Asia (ESCWA), the Middle Eastern Desalination Research Center (MEDRC), the Swedish International Development Cooperation Agency (Sida), and the Embassy of the Kingdom of the Netherlands in the UAE organized an online training webinar on 27 October 2020 titled “Addressing the Water-Energy-Food (WEF) Nexus in the Context of Climate Change and Sustainable Development” on “Vol. IV: Water, Energy and Food in the City of the Future (Smart Cities): The Role of Technology Innovation and Smart Technologies”.
2. The main objective of the webinar was to shed light on the development of smart cities through the WEF Nexus perspective and highlight the contribution ICTs, big data and the IoT have on the sustainability, economic growth and urban nexus metrics of cities.
3. The webinar was attended by a variety of participants representing various local key partner organizations, government and financial institutions and relevant governmental regional organizations, national experts, representatives from private sector, NGOs, academia and local communities.
4. The webinar was divided into two session.

## **II. RECOMMENDATIONS**

5. The webinar concluded with the following recommendations:
  - a) By bringing all actors from different sectors to work and develop coordinating plans with one another, through the Q-Nexus web tool, the nexus approach can move from theory to practice in a faster and more efficiency manner.
  - b) Develop smart cities to drive economic growth, sustainable environment, social inclusion and improve the quality of life.
  - c) Promote the use of ICT a key factor to improve the efficiency of the urban operations, and address the economic, social, environmental and cultural needs of present and future generations.
  - d) The IoT plays a significant role for the WEF nexus by improving the efficiency and sustainability in all water, energy and food sectors.

## **III. MAIN TOPICS OF DISCUSSIONS**

6. Presentations and discussions are summarized in the following sections which are organized according to the substantive sessions of the webinar.

### **A. SESSION I**

7. The session opened with a presentation covering the Q-Nexus web tool. The tool was developed to enable the nexus approach to shift from theory to practice. The Q-Nexus brings all actors from different sectors to work together and develop coordinating planning. It also provides data availability and technical/science-based models for all relevant actors to access thereby facilitating the communication and transparency in the workflow. The main advantages include the ability to respond to policy scenarios, consider technology variation, simulate and inform policy makers, and support data by mathematical theory to evaluate the direct and indirect effects.
8. The next presentation covered the smart cities’ core infrastructure and objectives in terms of economy, environment, and quality of life. The development of smart cities is catered to drive economic growth, provide a more sustainable environment, improve the quality of life by meeting water, energy and food demands, and support social inclusion and gender equality. The core infrastructure includes adequate water, electricity and food supply; sanitation and appropriate waste management, urban mobility and public transport, affordable housing, and robust ICT connectivity and digitalization.

9. The participants concluded that, despite the available challenges, smartening the city is a great opportunity to improve the existing fragmented initiatives with limited integration and coordination, as well as the water, energy and food sectors. The water sector can be improved in terms of distribution, soil moisture, and water quality. The energy sector can be strengthened by reducing the required energy needed for resource management; and finally, the food sector can be enhanced through reduced food imports and more efficient crops and livestock farming.

## B. SESSION II

10. The session started with a presentation on the definitions of ICTs and smart cities. The ICT enabling environment also played a key factor in the discussion as it showed the middle ground between infrastructure and platforms, transparent governance, and people, resource and capacity. Finally, the International Water Management Institute's (IWMI) Strategy 2019-2023 was brought up and analysed through the food, climate, and growth perspectives. With regards to the food sector, the aim is to improve security while sustainably managing water resources and ecosystems; for climate is to adapt and mitigate climate change while building resilience to water-related disasters, and for growth it is to reduce poverty and advance inclusion and equality as agriculture transforms and energy transitions.

11. The final presentation started by explaining the problems related to the WEF Nexus approach focusing on the fact that the sustainable use of resources depends on the resource characteristics, usage scenarios, supporting infrastructures, daily practices and policies; with a strong interdependence among the WEF systems. Therefore, any disruption can propagate among the different WEF sectors causing chain reactions. The presentation then discussed the significance of smart cities and why they are critical for development. Urbanization was introduced and linked to the steady rise of the WEF consumption patterns impacting the natural resources' scarcity and quality of life. The main challenge presented was to enhance the sustainability in dense urban environments in terms of securing WEF supplies and enhancing city services. Smart sustainable cities were thoroughly discussed with focus on Information and Communication Technologies (ICTs) and the Internet of Things (IoT).

12. The participants discussed and shared the same view to use ICTs to improve the quality of life and operation efficiency in smart cities. All the attendees agreed that the water, energy and food sectors can be greatly improved through new technological approaches such as ICTs and the IoT implementation. Finally, the interlinkage and data transparency between all relevant actors of different sectors were also common ideas the participants shared.

## C. CLOSING SESSION

13. The webinar sessions were closed by the moderator, Dr. Mustapha Taoumi, Clean Energy Key Expert, EU-GCC Clean Energy Technology Network. The closing statement emphasized the fruitful discussions during the webinar and the intention to continue coordinating and collaborating with the represented stakeholders.

# IV. ORGANIZATION OF WORK

## A. DATE AND VENUE

14. The webinar was organized online on 27 October 2020.

## B. OPENING

15. The webinar was formally opened by Dr. Nisreen Lahham, Regional Project Manager at International Water Management Institute (IWMI).

## C. PARTICIPANTS

16. The webinar was attended by a wide variety of participants representing various local key partner organizations, government and financial institutions and relevant governmental regional organizations, national experts, representatives from private sector, NGOs, academia and local communities.

#### D. AGENDA

17. Presentations and discussions were made over two sessions. The agenda of the webinar is summarized below:
- a) Session I
  - b) Session II

## ANNEX I: AGENDA

### Agenda

#### Session I

**Moderator:** Dr. Nisreen Lahham, *Regional Project Manager at International Water Management Institute (IWMI), Cairo Office, Egypt*

#### Speakers:

- Dr. Najib Dandachi, *Founder & CEO, Al Usul Limited, UAE*
- Dr. Ali Karnib, *Senior Water Expert and Professor of Engineering at the Lebanese University, Lebanon*

**Break:** 5 min

#### Session II

**Moderator:** Dr. Mustapha Taoumi, *Clean Energy Key Expert, EU GCC Clean Energy Technology Network*

#### Speakers:

- Dr. Maha Al-Zu'bi, *Researcher – Agricultural Water Solutions, International Water Management Institute-MENA, Amman, Jordan*
- Dr. Nikos Dimitriou, *Senior Research Associate, Institute of Informatics and Telecommunications National Center for Scientific Research "Demokritos" Athens, Greece*

**Q&A and Wrap Up**

**Closing**