INTER-REGIONAL EMERGING TECHNOLOGIES FOR DEVELOPMENT WEEK FOR THE ARAB AND AFRICAN REGIONS

13-18 DECEMBER 2020

Outcome Report

1. Preamble

The Africa-Arab Interregional Emerging Technologies for Development week was held online from 13th to 18th December 2020 online with the theme " **Emerging Technologies for Development** ". The objective of the Week was to promote the wide scale deployment of emerging technologies including, Artificial Intelligence (AI), Internet of Things (IoT), Big Data, low orbiting satellites, and 5G to ultimately contribute to the achievement of the Sustainable Development Goals. The online meeting witnessed the registration of 451 delegates from Africa and Arab Regions, among which about 295 effectively attended the various sessions of the week and contributed to its success. The online week was made of various sessions, among which one could quote partners sessions, online training sessions, sessions on the presentation of feasibility reports, roadmaps and toolkits, sessions on Big Data, AI and the organization of an AI challenge, and finally the presentation of ITU and the UN system initiatives on AI. The purpose of this outcome report is to give an analytical summary of that Interregional Emerging Technologies for Development week, the very first of its kind at ITU, draw the lessons from it and fine-tune the preparatory process for the upcoming years. More details are available at the event website: https://www.itu.int/en/ITU-D/Conferences/ET/2020/Pages/Programme.aspx

2. **Outcome from the different sessions**

   2.1. **Opening ceremony**

The Emerging Technologies (ET) week was officially opened by the BDT Director, Ms. Doreen Bogdan-Martin, who welcome the attendees to the meeting and highlighted the importance of ICT for socioeconomic development, particularly during these hard times of COVID-19. She pointed out the importance of ET, such as Artificial Intelligence (AI), Internet of Things (IoT), 5G, Serverless Computing/Cloud computing, Biometrics, Augmented Reality/Virtual Reality, Blockchain, Robotics, Drones, Cybersecurity, Natural Language Processing, and Quantum Computing, in digital transformation and emphasized on their contribution, as a catalyst, to achieve UN Sustainable Development Goals to make an impact in people's daily life. While ITU's focus for 2020 ET Week edition will be on SDG 2 (Zero Hunger), SDG 3 (Health and Well Being), SDG 8 (Decent Work and Economic Growth) and SDG 9 (Industry, Innovation and Infrastructure), she noted that ITU was planning to address other SDGs in the upcoming editions of the event during the upcoming years.

Prior to that, the launching of the ET week was done one day before by Andrew Rugege and Adel Darwish, Regional Directors for Africa Region and Arab States respectively. The two Regional Directors emphasized the importance of ICT, and ET particularly, for their member States development. The also magnified the need of cooperation and synergy of actions to make ET dissemination among member States a tangible reality.

   2.2. **Presentation of feasibility report on emerging technologies**

During that session, moderated by Ali Drissa Badiel, ITU's Area Representative for West Africa, two eminent experts, namely Dr Ahmed Kora, Professor from ESMT, Dakar, Senegal, and Dr Abdoul Karim Ganame, Cybersecurity expert, and Professor at Ecole Polytechnique de Montreal, Canada, were the panelists. The feasibility report on emerging technologies was presented; it addressed state of the art in infrastructure, applications, cybersecurity landscape in the digital economy world while proposing best practices for countries to keep abreast with technology development in this fast-changing environment of ICT and mastering cybersecurity to combat potential cyber threats related to ET. The document presented during that session, added to the outcomes of the discussions, served as food for thought for the rest of the sessions.

   2.3. **High-level panel discussion**

That high-level session, moderated by Andrew Rugege, ITU's Regional Director for Africa, received high-ranking panelists from the Africa and Arab regions, namely from the Ministry of ICT in the Kingdom of Saudi Arabia, the Executive Director of Smart Africa, and from "Organisation Internationale de la Francophonie" (OIF). Discussions turned around the concerned organizations' visions and perspectives on ET role in their respective digital transformation agendas; they also addressed synergies and potential areas for collaboration and coordination efforts for ET development and deployment for a real digital transformation

uptake in the Africa and the Arab regions, while leaving room for collaboration and addressing critical situations such as the COVID-19 pandemic.

2.4. Connect2Recover: Emerging Technologies for Connectivity in the Wake of COVID-19

This session was organized within the framework of the Connect2Recover Initiative, which aims to reinforce the digital infrastructure and ecosystems of less connected countries in the wake of COVID-19. In this context the session explored various emerging technologies that may help countries expand resilient and affordable digital connectivity.

Laith Hamad, Director, Middle East and Africa, OneWeb, presented how new low Earth orbit (LEO) satellites can enable low latency high-speed broadband connectivity, including for enterprise, maritime, aviation and government applications as well as support backhaul for cellular communications. The infrastructure that makes it possible includes not only cost-efficient satellites themselves, but also a variety of user terminals, flat panel antennas, ground stations leveraging cloud computing technologies, operation centres, gateways and points-of-presence (PoPs).

John Baker, Senior Vice-President, Business Development, Mavenir, discussed innovations in radio access network (RAN) technologies, enabling increased competition among vendors, lowering costs and increasing flexibility, such as Open RAN and vRAN. New generation networks are based on open hardware, fully programmable, include open secure interfaces and enable containerization, rapid innovation and automation. He also presented organizations working to develop and promote Open RAN, such as the O-RAN Alliance as well as Open RAN Policy Coalition.

Emmanuel Coelho Alves, Senior Wireless Director, Huawei, presented the vendor's wireless connectivity roadmap, including developments in fixed wireless access technologies. He presented how comprehensive solutions, involving mobile broadband, cloud and AI, support Industry 4.0 applications, including in agriculture. He also discussed how new wireless technologies ensure lower energy consumption, thereby also contributing to the achievement of climate goals.

Finally, Luzango Mfupe, Principal Researcher, NextGen Ent & Institutions, Council for Scientific and Industrial Research (CSIR) of South Africa, discussed the current state of digital connectivity in Africa. He also introduced measures (e.g., temporary spectrum assignments) that regulators, for example the Independent Communications Authority of South Africa, took to support the increased demand for connectivity during the COVID-19 pandemic. He specifically introduced a cloud-hosted geolocation-based dynamic spectrum allocation technology platform, developed by CSIR, to enable application of Television White Space (TVWS) technologies to support cost-effective digital connectivity, and CSIR work to support rural broadband network operators in extending connectivity to users in South Africa, especially in the territories heavily impacted by the pandemic.

2.5. Imagining the Future of Technologies for Development

This session provided a platform for youth representatives to engage with development and ICT experts on their visions about the future of emerging technologies for development in 2030 and beyond. The session was moderated by the youth who were namely:
• 	Mr. Martial Anicet S. Kiemde, PhD candidate ESMT Dakar, Senegal
• 	Ms. Mame Aminata Diambo, Student, ESMT Dakar, Senegal
• 	Mr. Nura Qasrawi, University Student, Palestine
• 	Ms. Masa Qzaih, University Student, Palestine

The speakers of the session were as follows:
• 	Ms. Dena Assaf, UN Resident Coordinator, UAE
• 	Dr. Mactar Seck, Senior Economic Affairs Officer, UNECA
• 	Mr. Muluk Turhan, Intel Corporation

Interesting perspectives were shared by the distinguished speakers particularly emphasis was made on the critical importance of accelerating the achievement of the SDGs by investing in emerging technologies. Moreover, youth representatives stressed the need for all stakeholders to take immediate collective actions to promote youth participation particularly in areas pertaining to ICTs for SDGs.

2.6. Big Data and AI for development

Big data is transforming both the public and private sectors, increasing efficiency, maximising productivity, promoting sustainability and building resilience. Harnessing this new commodity will allow countries and businesses to build sustainable economic growth. Insights from big data will stimulate evidence-based decision making within government, business and the development community.

This session featured the presentation Emerging Technology Trends on big data and AI. The presentation was followed by a panel discussion on AI and big data on the following key topics:

- The role of Big data and AI in socio-economic development
- Key elements of data infrastructure and technologies
- Data applications for development in health, agriculture, and education
- Public policies, laws, regulations and national strategies for AI and big data for development
- The importance of data skills for development

The session was moderated by Mr. Istvan Bozsoki Head, Infrastructure and Network management, BDT, ITU and featured the following speakers.

- Ms. Aminata A. Garba, Senior Coordinator (Technology) ITU
- Ms. Sally Golestan Radwan, Minister's Advisor for Artificial Intelligence, Ministry of Communications & information Technology, EGYPT
- Mr. Alan PAIC, Senior Policy Analyst, Science and Innovation Policies, OECD
- Ms. Cristina Pombo, Inter-American Development Bank
- Ms. Mirjana Stankovich, Tambourine Innovation Ventures
- Mr. Youssef Travaly, All Sights Africa

2.7. ITU Initiatives on Emerging Technologies

The objective of this session was to present key initiatives and activities on emerging technologies from ITU. This session showcased some of the key initiatives and activities related to emerging technologies across the ITU. Representatives from the BDT, BR and TSB presented some of their work on emerging technologies. The session was moderated by Mr. Stephen Bereaux, BDT Deputy Director, ITU. The session started with a welcoming remarks by Mr. Stephen Bereaux, BDT Deputy Director, ITU followed by a series of presentations followed by Q&A. The following presentations were delivered.

AI for Good – Time to move the needle (Frederic Werner, TSB)

This presentation introduced the AI for good summit as the leading action-oriented, global & inclusive United Nations platform on AI. The Summit is organized every year by the ITU in partnership with 38 United Nations organizations, XPRIZE, ACM and co-convened with Switzerland. The goal is to identify practical applications of AI to advance the United Nations Sustainable Development Goals, and scale those solutions for global impact. The Summit is now presented as an 'All year, Always Online' digital event, allowing us to scale our mission and has generated a

number of collaborations in ITU in the form of AI related Focus Groups on the topics of Health, Autonomous Driving, Machine Learning and 5G, and Environmental Efficiency.

Radiocommunications and Artificial Intelligence (AI) (Saman Jalayerian, BR)

This presentation gave an overview of a potential role of AI in radiocommunications. It briefly presented the structure and activities of the Study Groups of the ITU Radiocommunication Sector. Introduces possible utilization of AI in emerging radio technologies, such as 5G, IoT, Intelligent Transport Systems, including autonomous cars. The presentation also gave examples of AI applications in broadcasting and next-generation satellite systems to make them more autonomous. Potential usage of AI for dynamic spectrum management and enhancing radiomonitoring techniques were illustrated. The synergy of the two technologies and the role of radiocommunications as one of the enablers of AI applications was finally introduced.

Example uses of emerging technologies for development (Hani Eskandar, BDT)

The presentation provided examples of activities undertaken by the Telecommunication Development Bureau (BDT) to leverage some of the emerging technologies for development. Activities include documenting and sharing case studies on the use of frontier technologies such as Big data, Blockchain, Drones and Artificial Intelligence for agriculture and food security. Other activities include concrete projects such as the use of telemedicine and Artificial intelligence for early detection of Diabetic Retinopathy in Senegal, the use of Blockchain for Pig tracing in Papua New Guinea and the use of architectural approaches centered around APIs to unlock monolithic legacy systems leading to more efficient, cost-effective, accelerated deployment of government public services particularly in resource-constrained environments.

2.8. Launch Event: ITU Last Mile Internet Connectivity Solutions Guide

This session featured the launch of ITU Last Mile Connectivity Solutions Guide which is designed to guide efforts to extend affordable sustain connectivity service to under-connected localities. The Guide also assists governments in their role of funding and implementing universal access to connectivity. This includes identifying the unconnected areas and selecting sustainable technical, financial and regulatory solutions to ensure affordability and accessibility to relevant connectivity services.

The session provided an overview of solutions for last mile connectivity in rural and remote areas based upon successful implementations in countries around the world. Opening Remarks were delivered by Mr. Stephen Bereaux, Deputy Director BDT. The session was moderated by Mr. Istvan Bozsoki, Head, Telecommunications Network and Spectrum Management. It started with a presentation on the Last Mile Connectivity Solutions Guide followed by a panel discussion. Participants discussed technical, business and regulatory considerations for implementing last mile connectivity solutions to connect the unserved and underserved populations, especially in rural and remote areas. More specifically, the following key topics were discussed:

- Overview of the ITU Last Mile Connectivity Solutions Guide;
- Key challenges to address the connectivity gaps;
- Key policies, technologies and business models to build and expand last mile connectivity, especially in rural and remote areas;
- Challenges for affordable last mile connectivity for scaling up and sustaining the connectivity.

- Collaborative strategies to ensure that people at the bottom of the social pyramid achieve reliable and meaningful connectivity;
- **Case studies of** successful rollout of last mile connectivity projects **deployment.**

Panellists

- Ms. Jane Coffin, Senior Vice President, Internet Growth, *Internet Society*
- Ms. Patricia CooperVice President of Satellite Government Affairs, SpaceX
- Ms. Aminata A. Garba, Senior Coordinator (Technology), ITU
- Mr. John Garrity, Chief Technical Advisor, UNDP Philippines; Digital Connectivity Consultant, Asian Development Bank
- Elizabeth Migwalla, Senior Director, Government Affairs (Africa), Qualcomm.
- Mr. Ben Robert, Group Chief Technology and Innovation Office, Liquid Telecoms

2.9. AI for Development Challenge Award ceremony

The AI for Development challenge was organized for the Arab and African regions by the International Telecommunication Union in partnership with the FAO, UNESCO, UNDP and WHO and Facilitated by Nile University in addition the strategic partnership with Etisalat and many other local and international organizations. The challenge was targeting a multitude of stakeholders including Entrepreneurs, Startups, Innovators, Mobile Operators, Technology Providers, Policy Makers and others in the Middle East and Africa. Moreover, the objectives of the challenge were to, identify great ideas in AI and potential utilizations to address developmental challenges, prompt new collaborations and partnerships around the use of AI to achieve SDGs, and build the capacity of new innovators in Emerging Technologies and support their entry into the market. The challenge sought innovative solutions using AI to address SDGs 2, 3, 8, and 9. Over 200 applications from 20+ countries across the Arab and African regions were received from which four winners were selected to receive cash prizes amounting to 12,000 USD.

Specifically the winners were as follows:

- ESRA (Qatar): ESRA uses state-of-the-art deep learning based Dense Net Model to estimate the emotional status of the children using their drawings. The model is trained on manually labelled children drawings to learn hidden features in the images associated with the emotional status of the children and uses the learned features to predict emotions in future unseen drawings
- Access AI (Somalia): Access AI platform convert a social challenge into a lucrative business opportunity by bridging the huge demand for data labeling globally with thousands of

unemployed youths in Africa. They serve as an infrastructure that enables the booming of AI in Africa and the world while solving employment problems

- Intellicrowd (Tunisia): Their Platform allows backers to detect fraud in crowdfunding campaigns using AI based on the behavioral patterns of applicants which identify the warning signs of fraud attempts and incidences
- Lend an Arm (Nigeria): Lend an arm uses Asake, an AI powered bot to blood supply issues in Nigeria. It connects DEMAND (hospital) TO STORE (blood bank) via their AI Powered Mobile App

For more information please check the website: www.ai4dev2020.com

2.10. **Realizing the Potential of Blockchain**

Moderated by Martin Adolph, TSB, this session revisited some of the principles and promises underlying blockchain; showcased practical scenarios where blockchains are utilized in the context of contributing to the attainment of the Sustainable Development Goals; and discussed some recommendations aimed at enabling countries to take advantage of distributed ledger technologies as they mature.

Following opening remarks from Bilel Jamoussi, ITU/TSB, Suzana Maranhão, BNDES, Brazil introduced key concepts of distributed ledger technologies and blockchain, highlighting their core features and showcasing the unique advantage they bring across a wide range of industries, concluding with a practical example of its application at BNDES and in other Brazilian government departments.

This was followed by Dr. Agnes Mindila, JKUAT, Kenya who provided further context on the unique advantage of blockchains by showcasing how its properties can be leveraged for application in managing the vaccine supply chain. Highlighting some of the challenges encountered in implementing this use case, Dr. Mindila shared some recommendations and key practical considerations that future implementers could apply to facilitate quicker adoption.

To conclude the session, Gillian Makamara, TSB, shared the ITU's approach in supporting the innovation and development of blockchain and distributed ledger technologies through standardization.

2.11. Presentation of countries' roadmaps

During that session, moderated by Ali Drissa Badiel, ITU's Area Representative for West Africa, roadmaps were developed on emerging technologies for development for three pilot countries, namely Cote d'Ivoire, Gabon, and Malawi. The main presentations on the roadmaps were made by Dr Ahmed Kora, Professor at ESMT, Dakar, Senegal, and Dr Thomas Senaji, Professor at Kenya Methodist University, Nairobi, Kenya and subsequent panel discussions followed, involving representatives from the beneficiary countries of these roadmaps who provided valuable insights to fine-tune the work done, as well as a panellist from Nile University who contributed to enrich the discussions from Arab States perspectives. Discussions also received contributions from the audience and were very inspiring and profitable to participating countries.

2.12. Emerging Technologies for SDGs

This session was moderated by Mr. Karim Abdelghani, Programme Coordinator, ITU Arab Regional Office. Panelists included the following:

- Dr. Ahmed Mandil, Coordinator, Research & Innovation, Science, Information & Dissemination, WHO/EMRO
- Dr. Abeer Shakweer, Assistant Resident Representative, Inclusive growth and Innovation team leader, United Nations Development Programme Egypt Country Office
- Prof. Paul Hector, UNESCO
- Dr. Rachied Serraj, FAO

The session showcased selected initiatives on using emerging technologies for development. In particular, panellists presented experiences for utilizing AI and other technologies in areas pertaining to SDG 2 (zero hunger), SDG 3 (good health and wellbeing), SDG8 (decent work and economic growth) and SDG 9 (industry, innovation and infrastructure). Moreover, light was shed on the ongoing collaboration between ITU and the respective UN organizations WHO, UNESCO, UNDP and FAO in the Arab and African regions.

2.13. ITU-GSMA Joint Online Capacity Building Course on 5G — The Path to the Next Generation for the Arab and Africa Regions

5G capacity building course was organized virtually during 15-17 Dec 2020 by ITU and delivered by GSMA. The training course was exclusively offered free of charge to regulators, policymakers, government and ministerial officials of the regional ITU member states from Arab and Africa regions. The training course attended by more than 70 participants and covered the following topics:
- The Development of Mobile Technology
- The Global Status of IMT2000/5G and Forecasts for Future Growth
- Initial Use Cases (Enhanced Mobile Broadband & Fixed Wireless Access)
- New Use Cases (Internet of Things & Ultra-Reliable Low-Latency Communication)
- Spectrum and RF-EMF (The global status of spectrum for 5G & 5G and RF-EMF)

At the end of the course, participants were been tested, evaluated and training certificates were distributed to the participants.

2.14. Partners sessions

Throughout the week stakeholders organized a number of activities as their contribution to Emerging Technologies for Development week. These activities were namely the following:

- Localized big data applications for supporting decision making (organized by UNESCWA)
- Global conference on artificial intelligence and internet of things (organized by IEEE)
- Field visit and panel discussion on "emerging technologies in morocco and their contribution to the SDGs achievement (organized by the UN Resident Coordinator of Morocco)
- Regional expert meeting on national digital development reviews 2.0 – enhanced methodology and updated guiding template (organized by UNESCWA)

For more information on each of these event please check the webpages of each event as indicated on the Emerging Technologies for Development week website.

3. Lessons learnt and way forward

- Extend the ET week organization to involve all BDT 6 Regions and HQs, as the first edition has been proved to be successful and welcome by all attendees.
- Inquire with member States and potential partners about the thematics to be considered for the following edition of the ET week. This would make the event more "fit for purpose" and increase participation.
- Take advantage of ITU BDT's major events, such as Study Groups meetings, GSR, TDAG to conduct an advocacy and outreach campaign on the ET week, in order to create more awareness around it and to mobilize potential partners and donors.
- In each Region, conduct an advocacy and outreach campaign on the ET week towards major actors, such as RECs and financial institutions to have their buy-in and their participation in the event organization; this would end up giving the ET week a global dimension.
- It would be useful to have registration on the event and then on the Sessions.
- We have to inform/remind the speakers and moderators before their session and send them personalized message on how to register and login.

4. Recommendations

- Stability of 5G spectrum policies is essential for investments
- Participants discussed regulatory options to promote investment in Emerging Technologies in general (e.g. 5G, IoT, AI), as well as the legal and regulatory frameworks and business models.
- Participants emphasized on the importance of making radio spectrum available to stimulate social and economic progress and making efficient and effective use of spectrum.
- Participants asked for continuous capacity building activities on emerging technologies.
- Participants recommended development of infrastructure and connectivity to facilitate the uptake of Emerging Technologies.