



Economic and Social Commission for Western Asia (ESCWA)

Arab Industrial Development and Mining Organization (AIDMO)

Report

Expert group meeting on technological innovation and entrepreneurship and the role of science and technology parks for sustainable development in the Arab region Amman, 26-28 November 2019

Summary

An expert group meeting on technological innovation and entrepreneurship and the role of science and technology parks for sustainable development in the Arab region was convened at the Royal Scientific Society (RSS) in Amman from 26 to 28 November 2019. The meeting was organized in collaboration with the Arab Industrial Development and Mining Organization (AIDMO). The meeting discussed the solutions for bridging the gaps in the innovation and entrepreneurship ecosystems in the Arab region at the policy and practical levels as well as defined the priorities concerning interventions by the United Nations.

Over 11 sessions, participants discussed the status of national innovation and entrepreneurship ecosystems and technology and innovation in the Arab region. They also addressed the role of a digital enabling portal for small- and medium-sized enterprises (SMEs) and technology development and transfer offices for knowledge commercialization and employment. Regional cooperation framework in technology for development, regional initiatives were also discussed. Participants also tackled the role of science and technology parks in the adaptation, transfer and acquisition of technology as well as incubators in promoting sustainable industrial development and harnessing frontier technologies for entrepreneurs.

The expert group meeting concluded with a set of recommendations and key messages on the priority actions needed to strengthen the innovation/entrepreneurship ecosystem in the Arab region at the national and regional levels, as well as to enhance regional cooperation between National Technology and Transfer Offices (NTTOs) and Science and Technology Parks (STPs), and other stakeholders in the Arab region. The present report provides an overview of the main themes and discussions addressed at the meeting and the results of the evaluation.

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Introduction

1. The Economic and Social Commission for Western Asia (ESCWA) organized an expert group meeting on technological innovation and entrepreneurship and the role of science and technology parks for sustainable development in the Arab region, in collaboration with the Arab Industrial Development and Mining Organization (AIDMO) which operates under the League of Arab States (LAS). The meeting was held at the Royal Scientific Society (RSS) in Amman from 26 to 28 November 2019.
2. The main objective of the meeting was to discuss solutions to bridge the gaps in the innovation and entrepreneurship ecosystems in the Arab region at the policy and practical levels. The meeting also aimed to discuss the role of National Technology and Transfer Offices (NTTOs) and Science and Technology Parks (STPs) in entrepreneurship ecosystem as well as the role of “techno-preneurs” in achieving sustainable development.
3. The present report highlights the main outcomes of the meeting and provides a summary of the presentations and discussions.

I. Outcomes

4. The meeting led to the following recommendations proposed by participants:
 - (a) Disseminate and support all innovation approaches among youth and institutions supporting innovation, including incubators and accelerators. These include linear, mission-oriented, grassroots, open and social approaches to innovation;
 - (b) Integrate different innovation approaches in science, technology and innovation (STI) policies, and set the principles and mechanisms to stimulate and sustain them;
 - (c) Develop laws, legislation and enabling environment in the Arab countries to stimulate and develop technological entrepreneurship as it provides opportunities to tackle unemployment, especially among youth and women;
 - (d) Provide legal and procedural support to facilitate and stimulate social entrepreneurship and the creation of social enterprises;
 - (e) Launch and support national and regional initiatives to stimulate entrepreneurship in the Arab region;
 - (f) Reach out to the Arab countries that are not part of the initiative to establish the regional network for technology transfer and development, to join and support it with the necessary data, under the auspices of the ESCWA Technology Centre;
 - (g) Adopt the suggestions and ideas submitted by the participants regarding the establishment of a regional platform to harness digital technological tools in support of small- and medium-sized enterprises (SMEs) under the auspices of ESCWA;
 - (h) Develop performance indicators and evaluate the impact of the technology transfer offices’ work programmes in the Arab countries;
 - (i) Incorporate the culture of innovation, entrepreneurship and intellectual property protection in the educational curricula in Arab countries in cooperation with relevant regional organizations, including Arab League Educational, Cultural and Scientific Organization (ALECSO) and the Islamic World Educational, Scientific and Cultural Organization (ISESCO), and prepare guides and organize training workshops to strengthen innovation and promote the culture of self-employment after graduation;

(j) Call on Arab governments to create innovation funds that deduct at least 1 per cent of the profits of government and private companies;

(k) Create and develop legislation on intellectual property and innovation that stimulates the promotion of applied scientific research;

(l) Call on Arab countries to establish an Arab entity that works to break the barriers to achieving mutual benefits among countries in the production of technological products;

(m) Allocate a specific percentage of the gross national income to develop the capabilities of entrepreneurs and assist them in establishing private businesses, in addition to strengthening their ability to plan and implement;

(n) Update education curricula to cope with the scientific and technological developments given its positive impact on technology transfer, localization and sustainability;

(o) Encourage the collaboration among scientific research centres and launch regional programmes on priority areas.

II. Topics for discussion

5. The meeting spanned three days and consisted of 11 sessions. Discussions on the topics discussed are summarized in the following paragraphs.

A. Opening

6. Mr. Nael Al Mulki welcomed participants to the meeting and to Jordan on behalf of ESCWA Technology Centre (ETC). He stressed the sustained partnership with AIDMO over many years has led to the implementation of joint activities and more effective support to stakeholders of sustainable development in Arab countries.

7. Mr. Ayad Jalloul, representing the Research and Development Department in AIDMO, presented the remarks of the AIDMO Director General, noting with appreciation Jordan's leadership and role as host of the event jointly with ESCWA. In addition, AIDMO stressed the importance of inclusive development as well as technology transfer in Arab countries, particularly as the technology gap is widening between developed countries and local communities.

8. Ms. Nibal Idelbi, officer in charge of Technology for Development Division in ESCWA, welcomed participants and thanked partnering institutions for the joint efforts, especially Jordan Royal Scientific Society and AIDMO. She highlighted the importance of innovation and technology for accelerating the achievement of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs). She informed the participants about the latest ESCWA activities including publishing two reports, the first on Innovation and Technology perspectives for the Arab region in 2030, and the second on the fourth industrial revolution. She also stressed on the importance of youth entrepreneurship, especially in the domain of technology, and the importance of creating an enabling the environment with proper policies towards supporting the implementation of the SDGs.

B. Session I: National innovation and entrepreneurship ecosystems: gaps and effective solutions

9. The first session on innovation and entrepreneurship ecosystems was moderated by Mr. Amr Farouk Abdelkhalek Moustafa, Assistant Chief of the Academy of Scientific Research and Technology (ASRT) of the Ministry of Scientific Research in Egypt. Ms. Idlebi presented a summary of the current situation of innovation

and entrepreneurship in the Arab region and provided some mechanisms for solutions. Her presentation highlighted the Global Innovation Index which shows that, with the exception of Morocco and Algeria, most of Arab countries have lost value in this ranking. She indicated that entrepreneurship sorely needed due to the lack of job opportunities in many Arab countries while there are many entrepreneurial initiatives in the Arab countries, they are not significant enough to have a clear impact on society, especially for women and youth, whose labour force participation rate are the lowest in the world. Ms. Nibal Idlebi also touched on the relationship of entrepreneurship to the SDGs as well as a number of United Nations resolutions on the importance of entrepreneurship, frontier technologies, value chain development, social innovation and Arab Digital Platforms. She concluded her presentation with a set of recommendations related to general policies, measuring entrepreneurship, enhancing entrepreneurship potential of Frontier Technology, value chain development, social entrepreneurship and digital platforms.

10. The next panellist in the session, Mr. Arif Abdolgadir Tag el Deen Yousif, Head of Technical Committee of Mugran Incubator at the National Bureau of Graduates Employment (NBGE) in the Sudan, commended the seriousness of the problem-solving endeavours which have taken into account the specificity of each country, including the Sudan.

11. During this session, participants raised several issues that can be summarized as follows:

(a) The importance of intellectual property rights in the field of innovation, including the risks of businesses being copied, and the need for an Arabic digital platform;

(b) The recognition that youth and women are different groups and have unique sets of problems;

(c) The role of different institutions in transmitting entrepreneurial ideas and supporting implementation;

(d) Technology localization in terms of the transfer of knowledge and not only the transfer of devices and equipment;

(e) The importance of evaluating the work of technology transfer centres and their role in transferring technology from abroad, as well as the role of media in promoting businesses;

(f) The need to establish an Arab Investment Fund to support entrepreneurship, with a special focus on rural and remote areas and vulnerable groups;

(g) The existing deficiencies in the application of intellectual property protection laws and the activation of intellectual property (IP) offices; the importance of the patenting process, as well as the need to have IP offices in universities;

(h) Arab digital content challenges related to cultural, media and digital content and the absence of scientific digital content, for example, related to health services and disease information;

(i) ESCWA should play a mediating role, providing evidence and arguments to decision-makers on the economic and social benefits of technological innovation and its relationship to development;

(j) Integration of entrepreneurial curricula in Arab universities, and perhaps also at different academic stages, including in elementary school;

(k) The importance of providing innovators assistance at all stages, especially marketing;

(l) Protection of incubators from profit-taking as well as consideration of ethical aspects;

(m) Organization of incubation work, competitions for inventors and entrepreneurs, enacting supportive laws and creation of a specialized database for all ideas that can be translated into viable projects;

(n) Establishment of the Arab Network for Industrial Incubators in cooperation with ESCWA and AIDMO, which, in turn, can serve as an industrial observatory that includes a database where investors can communicate and exchange creative ideas between countries.

C. Session II: Technology and innovation for sustainable development in the Arab region

12. The session was organized a platform to share successful public and private initiatives supporting youth innovation which is harnessing science and technology. The panel was moderated by Mr. Fouad Mrad, Senior Programme Manager at ESCWA. Mr Mrad shared background on the importance of accelerated action in Arab countries. While acknowledging the numerous public and private initiatives in support of innovation and entrepreneurship locally, other regions of the world are working faster and becoming more competitive. Countries in Arab region are slipping rank in international innovation indices even while they are becoming more relevant in international markets.

13. Ms. Sherine Abdelraouf presented a case from her organization, Egypt Electronics Research Institute (ERI-SCI). She presented their role in the development of local industrial products and emphasized on the importance of collaboration among various stakeholders for making progress in industry. She highlighted the national alliance for the development of local products in Egypt when government research centres collaborated with academia, private sector, NGO and SME for the production of specific electronic products. The key message was the importance of collaboration between local industry, research centres and academia in development work beyond research activities. The case showed a large local potential in electronics industry that can be easily scaled up for the region.

14. Ms. Fatima El Habti, Head of Innovation Cities and Clusters Development Service at the Ministry of Industry, Investment, Trade and Digital Economy in Morocco, presented a brief about the Morocco Innovation Cities vision, objectives and the expected result from the promotion of innovative entrepreneurship as well as the framework between partners. She highlighted the interaction of innovation city with the external environment mainly with business environment and research and development environment and gave example on the Agadir Innovation City. She proposed five steps needed to implement projects within an innovation city: project identification; business plan; partnership agreement; implementation and execution; governance and starting activities.

D. Session III: Small- and medium-sized enterprises in the Arab region

15. The session was moderated by Mr. Adel Alghaberi, Economic Affairs Officer at the Economic Development and Integration Division (EDID) of ESCWA. During this session, four panellists presented their projects. The first project was presented by Ms. Farah Al Gharib, Executive Director and Environmental Public Health Consultant at Precision and Choice in Saudi Arabia. Ms. Al Gharib introduced the project as a solution for environmental problems and related to women's establishments of SMEs. She listed the challenges faced during the creation of SMEs including finding space, training burden, poor networking opportunities and integration among Arab countries, poor strategies as well as taxes and customs-related issues. She explained that when starting an SME, beginners are forced to import certain quantities of material that are not available in the local market. Furthermore, she that ESCWA can play a role in engaging skilled people in the public sector and providing assistance to reduce the cost of training, in addition to providing assistance to researchers who aim to collaborate on certain projects with schools and universities.

16. Ms. Rasha AlEid, Founder of Al Juman Factory in Jordan briefed on the factory's profile, clarifying that the company works in the pharmaceutical industry on formulating and creating products in cooperation with pharmacies in Saudi Arabia. She explained that the main challenge was adapting to the difficult regulations

related to the pharmaceutical field as well as the high cost of participation in specialized meetings and exhibitions.

17. The intervention that followed was by Ms. Hinda Sahnoun, Founder of Educ'Art in Tunisia, who explained that the foundation, which receives governmental funding, contributes to development of children's capabilities. She explained that the challenges lay in the quantities of material required to be imported, which affected the costs of operation.

18. Ms. Ayat Al Qaralleh, founder of a start-up supported by the Kuwait Institute for Scientific Research (KISR), introduced her project which aims to promote road safety and create applications and start-up working in the domain of road safety. She highlighted the challenges they faced when licensing the company due to the difficulty of registration as well as introducing people to these services.

19. During this session, the participants stressed the role that governments need to play in providing universities with a curriculum that teaches issues related to regulations and laws and their application. ESCWA's role in acting as a bridge between Arab countries was thoroughly discussed, including taking into consideration the political will of government.

E. Session IV: SME digital enabling portal overview

20. During this session, the new ESCWA SME portal for the Arab region was discussed. The portal serves as a one-stop-shop for information needed by SMEs, including on national legislation and procedures for setting up businesses, sources of available funding, capacity-building for entrepreneurs and access to foreign markets. Mr. Mrad moderated the session, introducing the participants to the SME Digital Enabling Portal. He clarified that the initiative aims to design a digital tool that serves the small- and medium-sized enterprises as well as start-up companies in the Arab region. Mr. Mrad highlighted ESCWA efforts in terms of exploring and mapping the tools, organizations, institutions and programmes that already exist and support SMEs and start-ups in terms financing, marketing, human resources, skills, regulations and enabling environment. He briefed the participants on the findings that related to the main challenges that start-ups face at all levels: English language, regulations and human resources.

21. In his intervention, Mr. Alghaberi of ESCWA explained that the aim is to have a portal that serves the region and provides all the information needed by SMEs at the regional level. He presented an overview of the portal and its major components and sections. The session also included discussions on the pilot portal to ensure that it would add value to Arab entrepreneurs during which several recommendations were shared, such as how to benefit from global portals and platforms, including a customer services section, learning from the example of Nesta, an innovation foundation in the United Kingdom, and considering online crowdfunding, disseminating a newsletter, providing capacity-building activities, statistics and studies, engaging all relevant stakeholders and providing advisory services.

F. Session V: Technology development and transfer offices for knowledge commercialization and employment

22. The session on technology development and transfer offices was moderated by Ms. Nibal Idlebi. The session aimed to explore enabling conditions for the successful and effective management of a national technology transfer office (NTTO). Within this context, Ms. Idlebi informed the participants that ESCWA has supported the establishment of a number of NTTOs and is currently providing support to the establishment of an NTTO in the Syrian Arab Republic and the State of Palestine. She also explained that the majority of NTTOs are national and therefore there is a need to establish a centre to transfer the knowledge to the whole region.

23. In his intervention Mr. Nizar Al Halasah, Senior Consultant on Innovation at Habibi Valtiberina Association (HVA) in Jordan, called for collaboration among all stakeholders including customs agents, importers, exporters, legislators, non-governmental organizations (NGOs), schools and universities, investors,

banks as well as institutions that finance innovation to build a well-functioning national innovation system. He explained that lack of enabling environment, awareness regarding innovation and the absence of alignment between universities and research and development in the industrial sector are among the major challenges that lead to an unproductive economic sector that does not benefit from youth's productivity. Mr. Al Halasah presented a project that aims to have a more competitive economy by focusing on education, IP and improving quality of education. He also presented the outcomes of the project which included a roadmap for national innovation.

24. The presentation that followed by Ms. Dalal Boresli, Technology Transfer Officer at the National Technology Enterprise Company (NTEC) in Kuwait, focused on how most technology transfer offices or any type of commercialization unit tend to measure success through the number of patents filed and/or exploited with the corresponding revenue. Ms. Boresli brought up the reluctance to file for patents and invest in high-risk projects. She expressed her opinion in encouraging NTTOs to use hybrid indicators and not to focus on the number of patents that can be acquired, but rather on the quality and value.

25. Mr. Moez Safta, Consultant Manager of Projects the National Agency for the Advancement of Scientific Research (ANPR) in Tunisia, presented the work of the agency which is under the Ministry of Higher Education. He clarified that ANPR works on the activation of the national research programmes and is responsible for their financial management. In addition, ANPR provides support to research and entrepreneurial community, evaluates research outputs and technology transfer to promote a national culture of technological innovation, as well as legal support regarding IP and help in IP registration. Mr. Safta explained that ANPR produces software that seeks to help the scientific research community, private enterprises and the international community, clarifying that the agency supervises and manages the 17 NTTOs around Tunisia (institutions, universities, research centres, etc.). The agency has incentivized students and doctors by helping them to discern chances, build business plans and explore different sources of funding.

G. Session VI: Regional cooperation framework in technology development and transfer

26. This session showcased the benefits of collaboration, especially in the regional context, and aimed to identify the pillars needed to enable and sustain a productive regional network of established NTTOs. It was moderated by Mr. Mrad.

27. The first intervention was made by Mr. Amr from the Academy of Scientific Research and Technology in Egypt, who provided a brief on the academy and its goal to develop a system of innovation and creativity in the country through a number of initiatives. Mr. Amr explained that a main challenge was obtaining funding. He informed the participants that restructuring resulted in the office setting up key performance indicators (KPIs) based on statistics and numbers. This has allowed them to move ahead to a new stage for technology transfer and marketing offices with additional funding. He also clarified that the Federation of Egyptian Industries includes 92,000 Egyptian companies.

28. Mr. Ilyas Azzoui, Innovation and Technology Transfer Unit, National Centre for Scientific Research and Technology (CNRST) in Morocco, highlighted the relationship between the years of schooling and income per capita for during the 40-year period from 1965-2005. He also explained the national innovation system and the capacities that depend on creation of knowledge, its diffusion, absorption and utilization for commercial purposes. Mr. Azzoui clarified that there is a systemic deficiency in Arab countries, whereby either some components are missing or there are few and consequently, there is a need to focus on increasing know-how through training. In his intervention, he also demonstrated the workings of the Economic Complexity Index and how it correlates with gross domestic product. He emphasized that the key players of the economy in innovation are the enterprises. He concluded with a video about patent inspiration with examples from Ghana and Thailand.

29. The next presentation, by Mr. Obaid Al Saeedi, Director of Programmes at The Research Council (TRC) in Oman, provided a brief on the technology transfer network in Oman with a focus on the local technology transfer office (TTO) services such as IP awareness and training, IP management, commercialization as well as academia – industry – government (AIG) linkages. He also highlighted the role of the NTTO at TRC, and the interaction between NTTO and local TTOs which are divided into two tiers (starting tier and continuous services tier, such as IP management and commercialization). Mr. Saeedi also explained the interaction between NTTO and TRC and Innovation Park Muscat (IPM) projects and presented the TRC achievements. He noted that 14 colleges signed an agreement to join the network, two State colleges have been funded by TRC (20,000 OMR each), in addition to support provided to private colleges, universities and workshops in training on technology transfer, IP, patent and IP policy. He concluded by stressing the pillars needed for enabling and sustaining a productive regional network of NTTOs, including capacity-building (AIG), knowledge transfer from well-established organizations (such as the World Intellectual Property Organization), having a common platform to share best practices and political will.

30. Mr. Mohamed Ahmad Mohamedali Ahmed, Manager of Digital Economic Department at Africa City of Technology (ACT) in the Sudan listed the key factors for successful entrepreneurship development programmes in Sudan, such as legalization of the law on entrepreneurship for small- and medium-sized businesses, adopting a complete and integrated strategy to support entrepreneurship and SMEs, and strengthening the entrepreneurial ecosystem. Mr. Ahmed highlighted the goals of ACT that focus mainly on capacity-building, facilitating the financing process and providing loans through financing portfolios. He also presented ideas on entrepreneurial development starting from early socialization, emergence (start-up), survival stage and ending by growth stage. Mr. Ahmed emphasized the importance of the influence of the Government, entrepreneurship and investment promotion to develop institutions and encourage investment.

31. The presentation by Mr. Majed Aljamali, General Director of the Higher Commission for Scientific Research (HCSR) in the Syrian Arab Republic, focused on the technology transfer system in the country. He explained that NTTO is under construction and clarified that its main tasks include technology transfer, setting national technology policies, networking and coordination between different bodies and building a database for researchers in cooperation with relevant ministries. Mr. Aljamali stressed the fact that the most important point is to ensure researchers' confidence in industrialists and framing the relationship between the two parties, especially in relation to intellectual property. He also stressed on the importance of the role of the United Nations organizations, especially ESCWA, from the political point of view with regards to coordination between Arab countries on laws and legislation. Mr. Aljamali called for turning challenges into opportunities in the Syrian Arab Republic, especially the challenges facing the national universities in this critical stage, by learning from other countries experiences.

H. Session VII: Regional entities supporting innovation and entrepreneurship and potential regional initiatives

32. The seventh session provided an overview of different available initiatives by various regional organizations for supporting entrepreneurs in delivering innovative solutions to the market. It was moderated by Mr. Ayad Jalloul, Director of Research and Development Department at AIDMO.

33. The first panellist, Mr. Ayman Kayssi, Professor and Associate Dean at the Department of Electrical and Computer Engineering at the American University of Beirut (AUB) in Lebanon, provided an overview of university, its students, percentages of gender distribution and the multiple initiatives of the university with a focus on engineering and entrepreneurship. He listed the challenges facing the implementation of the projects including how to have positive impact, be independent without relying on government support, sustainable, environmentally friendly, in addition to meeting the objectives of students and graduates and faculty. He explained that the objective is encourage students, and female students, to work on related topics and consider engineering as a career advantage. During his presentation, he stressed on the importance of entrepreneurship events that provide opportunities for students and showcase the outer world and clarified that AUB offers courses on entrepreneurship and helps students in finding internships at start-ups or accelerators.

Mr. Kayssi also highlighted that engineering students work on a final year project accelerator gets awards for starting a company that can survive for at least six months. In addition, AUB organizes student start-up competitions for graduates and undergraduates where they can apply for funding either from the school of engineering, the non-profit LebNet and provides students with an innovation centre and makerspace to work with mentors who are available for help when needed.

34. Mr. Bassam Alfeeli, Director of Innovation and Enterprise at Kuwait Foundation for the Advancement of Science (KFAS), briefed on the foundation which aims to encourage youth and spread scientific culture, encouraging scholars and researchers through securing grants and encouraging private sector to invest. Mr. Alfeeli explained that KFAS provides funding for scientific activities when governmental agencies do not fund these projects clarifying that they currently have six centres and are planning to expand. Mr. Alfeeli also clarified that KFAS builds constant relationships with international agencies and entities aiming to better serve Kuwait or provide funding.

35. The next panellist, Mr. Amir Hassan Abu Bakr Bashir, from the Arab Organization for Agricultural Development, introduced the entrepreneurship development programme directed by the United Nations Industrial Development Organization (UNIDO) that aims to enhance entrepreneurship among youth so they become job providers and not job seekers, as well as to mobilize and encourage an entrepreneurial ecosystem among stakeholders and non-profit organizations. He explained that the programme includes capacity-building for stakeholders and creating suitable ecosystems and entrepreneurial business programmes to enhance abilities such as personal traits and soft skills, self-confidence and technology and financial connectivity, etc. He also highlighted the three stages of counselling, incubation and follow up. Mr. Abu Bakr Bashir also shed the light on collaborations with institutions such as the Federation of Arab Chambers and the Association Arab Universities as well as different ministries and institutions in the agricultural sector.

36. In his intervention, Mr. Jorge Martinez Navarrete, Information and Technology Officer at the Innovation and Communication Technology of the United Nations Technology Innovation Lab (UNTIL), introduced UNTIL as the operational office in United Nations Secretariat, the technology advocate that supports United Nations offices and peacekeeping. He explained that UNTIL created many competencies in technology and helped build a number of electronic systems and tools to support decision making at the UN. Mr. Navarrete informed the participants about UNTIL initiatives for creating Innovation Laboratories to promote technological innovation in countries and regions, such as Innovation Lab in Finland and the Innovation Lab in Egypt. He indicated that that the Innovation Lab in Egypt is mainly focusing on education for special needs students, health, industry and agriculture in Egypt. He also highlighted their experience in the Innovation Lab in both Afghanistan and India. He concluded by indicating that their main aim is to empower the youth to use technologies for SDGs in different countries and regions.

I. Session VIII: Role of science and technology parks in the adaptation, transfer and acquisition of technology in the Arab region

37. The session included interventions from five panellists and was moderated by Ms. Hala Elkady, Professor and Dean of Engineering Research Division at the National Research Centre in Egypt. The first panellist, Mr. Nael Al Mulki from ESCWA Technology Centre (ETC), provided an overview of science and technology parks (STP) and their development phases. He touched on the theory of innovation and the topic of Triple Helix and Quadruple Helix models of innovation, as well as the goals and objectives of the STPs, which include three main axes: stimulating local and regional economic development by promoting employment and production growth; promoting the transfer of knowledge from academia to business; and facilitating the creation and development of new technology-based companies. Mr. Al Mulki showed that STPs support their tenants by providing physical infrastructure along with value-added services, business environment and networks. He briefed the participants about an ETC study on STPs in the Arab region which divided Arab countries into four main groups in terms of innovation policies, institutions, and science and technology parks: countries with dynamic and integrated STPs and innovation policies; countries with innovation policies and accelerating STPs to achieve economic diversification; countries with innovation

policies and emerging STPs; and countries with limited policies, innovations and research activities. He concluded his presentation by providing a set of strengths for educational institutions that included strong investment in human resources, solid IT infrastructure as well as the increasing groups of entrepreneurs. He clarified that challenges mainly relate to ineffective or lack of communication between the four stakeholders in Quadruple Helix (i.e., public, private, academia sectors, and society).

38. Ms. Maysoun Ibrahim, Chairperson of the National Forum on the Fourth Industrial Revolution at the Higher Council for Innovation and Excellence (HCIE) in the State of Palestine, highlighted the benefits of STPs, especially in providing job opportunities not only to project owners but also to workers in these facilities and their role in achieving the SDGs. She highlighted the role of innovation in economic growth and presented statistics on STPs in the Arab countries and total funding and deals. Ms. Ibrahim focused in her presentation on STPs in the State of Palestine showing the total number of research and development personnel as 8,715 according to the Palestinian Central Bureau of Statistics (PCBS) in 2017. She also shed the light on the obstacles facing the Arab countries including the weaknesses of the financial system, lack of regulations, brain drain and lack of innovation systems and strategies. She concluded with a set of recommendations under a theme of “Think or Sink”.

39. The state of Arab society in relation to the culture of business and entrepreneurship was discussed by Mr. Salim Chahine, Executive Director of Talal and Madiha Zein Innovation Park at AUB. He showcased the example of the German experience and compared it with the Lebanese case, highlighting the great support from German investment banks for emerging companies and venture capital, in contrast to Lebanon. Mr. Chahine shed the light on the importance of an entrepreneurship culture and financial factors as main issues. He clarified that AUB established an innovation park to take advantage of the available scientific laboratories, especially in the fields of engineering and science, and to develop a policy framework on intellectual property rights, in addition to organizing the method of education towards entrepreneurship. Mr. Chahine also highlighted the university’s practice of cooperating with Lebanese and global entrepreneurs to develop the Arab region and take advantage of their expertise and capabilities.

40. Mr. Fadhl Al-Nozaily, Vice Director at the Water and Environment Centre at Sana’a University in Yemen, presented a video about Hadramout Foundation of Invention and Advanced Science, explaining the efforts to establish a centre of excellence and creativity in Yemen at the University of Aden. Mr. Al-Nozaily also presented the request of the Ministry of Higher Education for Education and Scientific Research Affairs in Yemen for support to open and establish a technology transfer centre in Yemen, adopting the idea of virtual incubator and encouraging innovation among the university and private schools. He proposed a set of recommendations that focuses on facilitating funding and capacity building on graduation projects as well as enhancing legislations to support research and development in Yemen.

J. Session IX: Technology incubators and science parks in promoting sustainable industrial development

41. Mr. Abed Almotolib Othman, Advisor to the Minister of Industry in Egypt, moderated the session and presented his vision regarding Arab integration and benefiting from Arab experiences in research and development in various scientific, medical and engineering fields and the need to exchange knowledge to learn about the progress being made.

42. During this session, Mr. Jalloul briefed the participants about AIDMO’s contribution to implementing the SDGs, especially in the field of science and technology and its relationship to industrial development. He elaborated on Goal 9 which focuses on industry, innovation and resilient infrastructure and promoting comprehensive and sustainable industrialization clarifying that all industry, in its various sectors, is linked to all the SDGs and their related targets. Mr. Jalloul also highlighted the organization’s initiatives and activities in the field of science and technology as well as the organization’s plans and programmes which include the examining the role of science parks, industrial incubators, entrepreneurship and small and medium industries.

He stressed the role of youth and how to provide the necessary funding to remedy the lack of trust between youth and government.

43. A reflection of the political challenges of the situation in Iraq was discussed by Mr. Baha'a Eldeen Alzubaidy, a consultant at the Industrial Research and Development Authority, Ministry of Industry and Minerals, Iraq, with a focus on providing an appropriate climate for the establishment and development of science and technology parks. In his presentation, he reiterated the results of ESCWA study on "Innovation and Entrepreneurship: challenges and opportunities for Arab youth and women", as well as the quadrant analysis (strengths, weakness, opportunities, threats) of science parks. He clarified that challenges include lack of strategies and coordination between the different stakeholders, political situation, corruption, bureaucracy, in addition to relying only on oil without diversification of income sources. Mr. Alzubaidy also briefly introduced the Iraqi Center for Innovation and Creativity, a civil society organization, that aims to convert a vacated industrial complex into a technology complex.

44. Mr. Mohammad Al Khaldi, Director of the Economic Control and Inspection Unit at the Ministry of Industry, Trade and Supply (MIT) in Jordan, presented the Jordanian experience in the field of industrial clusters. He explained the Jordanian industrial policy for the period 2017-2021 contains several axes, with one being the Jordanian product development, creativity and innovation. This includes several goals such as the promotion of industrial clusters and the achievement of industrial linkages. He highlighted activity linkages such as to the European Enterprise Network (EEN) and the introduction of the principle of industrial clusters into the strategic plans of development areas, industrial cities and free zones, as well as the establishment of a cluster for the clothing sector in cooperation with UNIDO. Mr. Al Khaldi also briefed the participants on the current status of the activities and their functional procedures.

45. The importance of legislation to enhance the role of science valleys and technological incubators in universities and research centres was highlighted by Mr. Osama Dewedar, Researcher on Technology and Innovation Commercialization at the Ministry of Higher Education and Scientific Research in Egypt, who presented a case study to explain the incentives put in place by the Science, Technology and Innovation Incentives Law for the year 2018 and its executive regulations. He discussed the provisions of the mentioned law that focuses on the importance of ensuring resources through the exploitation of scientific research and the creation of science and technology valleys, technological incubators and through the establishment of companies. Mr. Dewedar also addressed the gap between academia and industry due to the lack of trust between the two parties and his recommendations focused on motivating researchers and research and development.

46. In his presentation, Mr. Korany Ali, Assistant Professor of Organic Chemistry at the National Research Centre in Egypt, emphasized the need for science to look at the market and for the market to look at science, moving from a "push strategy" to a "pull strategy" when innovating. He highlighted the critical need to build bridges between all stakeholders, especially between research and industry. Mr. Ali drew attention to the fact that even people with no scientific background can be important sources of innovation, generating IP, and as such need inclusive innovation practices. He also explained that Egypt's research centre provides funding, technology and innovation and technology transfer support. He concluded his presentation with a brief on one of the centre's successful initiatives that illustrated how one can build bridges between research and industry.

K. Session X: Support the acceleration of innovation initiatives and harnessing frontier technologies for entrepreneurs

47. The session included two interventions and was moderated by Mr. Fouad Mrad and Mr. Nael Al Mulki. The first panellist, Mr. Mohammad Oqeili, Chief Executive Officer and Founder of Ghoorcom Company in Jordan, explained the effect of e-commerce in reducing the waste of vegetables and fruits, and benefit to the small and medium farmers, through the establishment of the Ghoorcom company. He reviewed the current supply chain and presented the challenges facing the agricultural sector related to materials and mechanisms of transport and distribution of agricultural crops as well as the absence of a clear strategy on agriculture and

exports. Mr. Oqeili highlighted the services provided by his company, which is an electronic marketing platform for a delivery service, payment system and quality control system. He also summarized the results of the initiative which included providing consulting expertise, enhancing food security, guiding farmers on planting strategies and reducing food waste.

48. The second intervention by Mr. Kareem Hassan, Managing Director of Bena Foundation in Egypt, reiterated on the importance of the topics raised during the meeting, in which the most important factors that slow the wheel of innovation in the Arab region were discussed namely: working in isolation, especially between the government, research centres and start-ups, as well as the lack of community ecosystem in Arab societies. He emphasized the importance of building an entrepreneurship culture, especially among youth and highlighted the lack of capabilities to start new projects. Mr. Hassan also shed the light on the major issue of funding and lack of financing in support of entrepreneurial projects as well as the existing legislation and legal framework for entrepreneurship. He suggested adopting a conceptual approach that focuses on knowledge production by creating an Arabic innovation and entrepreneurship toolbox capable of providing sustainable solutions to all, or at least most, of the challenges, in addition to providing regional capacity-building support to the youth.

III. Organization of work

A. Venue and date

49. The expert group meeting was organized by the ESCWA in collaboration with the Arab Industrial Development and Mining Organization (AIDMO). It was held at the Royal Scientific Society in Amman during the period 26 to 28 November 2019.

B. Participants

50. The meeting was attended by 53 participants, of whom 16 were women, from 15 ESCWA member States (Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, State of Palestine, Qatar, Saudi Arabia, the Sudan, Syrian Arab Republic, Tunisia and Yemen), and from regional and international organizations such as AIDMO, ITU Arab Regional Office and other United Nations organizations. The list of participants is set out in the annex to the present report.

C. Documents

51. The list of documents and presentations related to the meeting are available at the following link: <https://www.unescwa.org/events/egm-technology-innovation-sdgs-entrepreneurship-arab-region>.

D. Evaluation

52. An evaluation questionnaire was distributed to participants to assess and rate the effectiveness, and impact of the meeting. Based on the results of the questionnaire, 96 per cent of the participants agree or strongly agree that the overall quality of the meeting met their expectations as well as it achieved its purpose. Ninety-two per cent of the participants agree or strongly agree that the meeting was relevant and the topics critical to advance discussion and action in the region and that there was a balance among thematic topics of the sessions.

53. The presentation style/moderation of the sessions/meeting was interactive and engaging and 80 per cent of the participants agreed or strongly agreed that the content of each session was clear and well-structured and there was clarity in the conclusions and next steps. Eighty-eight per cent of the participants agreed and strongly agreed that there was enough time for interactive discussion(s), and 96 per cent agreed or strongly agreed that the meeting was overall well organized and structured; 84 per cent agreed or strongly agreed that they received the meeting invitation in a timely manner and that their role in the meeting was clearly communicated.

Annex*

List of participants

A. Country organizations and experts

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