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المنتدى العربي للتنمية المستدامة
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17 PARTNERSHIPS FOR THE GOALS

SDG 17

PARTNERSHIPS FOR THE GOALS

Strengthen the means of implementation and revitalize the global partnership for sustainable development

Technology

Technological disparities and gaps between the Arab region and the world persist, including in the digital sphere. Internet access and mobile penetration gaps are observed between the poor and well-off, between rural and urban areas, and between male and female users.[1] At the subregional level, high-income countries, namely Gulf Cooperation Council (GCC) countries, have implemented advanced infrastructural and service projects, whereas middle-income countries are still at less advanced levels. Conflict and post-conflict countries face the challenge of destroyed/ disrupted infrastructure and services, and least developed countries lag behind considerably.

The role of technology in achieving the SDGs has become clearer owing to the COVID-19 pandemic. As disruptions affect various vital sectors and bring some to a complete halt, technology in general and digital technologies in particular have become key solutions, and sometimes the only means, to overcome sectoral disruptions, maintain continuity, provide access to information and services, and enhance the protection of vulnerable groups. Groups and countries that suffer from a digital gap face greater challenges in moving work to the digital space. In some Arab countries, emerging technologies, such as artificial intelligence, are gaining attention for their role in enhancing transparency and in analysing big data to monitor climate change and biodiversity loss, and to predict pollution. Emerging technologies are also being utilized for contact tracing and social distancing during the pandemic. Several Arab countries have recently adopted policies or strategies for digital transformation, including emerging technologies.

The pandemic highlighted the importance of science, technology and innovation (STI) in various fields and in facing the virus. While Arab countries have contributed, albeit to a limited extent, to research in therapeutics and vaccine development for COVID-19, historically, STI policies in the region have generally failed to catalyse knowledge production effectively or add value to products and services, because they focus on supporting research and development with little attention to commercialization aspects.

Arab countries are aware of the need, and have initiated action, to adopt ethical and legal frameworks which ensure that technology development, transfer and use serve society without causing harm to vulnerable individuals or the environment.

Today, the international community's role in achieving SDG 17 is more critical than ever. The global commitment to supporting developing countries through technology transfer and related instruments must be revitalized to strengthen the region's progress towards the SDGs and a sustainable recovery from the COVID-19 crisis.

Impact of COVID-19 on technology in the Arab region
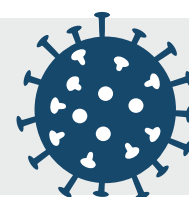
Technological gaps and vulnerabilities have been revealed. Lockdown measures adopted worldwide and in the Arab region to contain the spread of the pandemic have resulted in severe disruptions to vital sectors. Arab countries that already had well-established digital infrastructure, good connectivity and advanced innovation have been able to ensure continuity in businesses, education and trade during the pandemic, which was mostly the case in GCC countries. One example from GCC countries is leveraging digital technology for the better protection of temporary contractual workers, such as e-recruitment platforms.[2] Where available, e-government services have ensured the continuity of service delivery and maintained the relationship between Government and citizens. In contrast, Arab countries that do not have appropriate infrastructure and suitable platforms or e-services to ensure work continuity in Government, the private sector, schools and universities, and the provision of information and delivery of essential services, have struggled to adapt. This was mostly the case in the Arab least developed countries and those affected by conflict.

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1   ITU, Measuring digital development: Facts and figures, 2019.

2   IOM, IOM and ILO launch joint report on promoting fair and ethical recruitment in a digital world, 2020; The sixth consultation of the Abu Dhabi Dialogue endorsed the role that electronic systems and digital technology can play in enhancing ethical recruitment.

The pandemic has driven digital transformation efforts as part of country response plans. The COVID-19 crisis has accelerated digital transformation efforts globally and in the Arab region, including the expansion of online education and use of digital open education resources; and the development of artificial intelligence systems, notably in the health sector, and for the recruitment and better employment protection of temporary contractual workers in GCC countries.

The crisis has also triggered government action and innovation in devising solutions to the pandemic. The role of Government has been reinforced, as has its obligation to be agile and effective in providing a timely response that targets people's needs and safety requirements. Examples of this can be seen in Egypt and Lebanon, where digital capacity-building programmes have been organized for government employees. Kuwait implemented Social Watcher, an online open community service platform that provides a dashboard with daily statistical updates on COVID-19,[3] resulting in legal and regulatory decisions to implement mechanisms that manage the crisis and provide an enabling environment for the post-pandemic period. Similar dashboards were set up in several other Arab countries.

Limited access to digital transformation opportunities for women and girls

Various studies have found that the digital transformation imposed by the pandemic has not been inclusive, further widening the digital divide for women and girls because of their unequal access to the Internet, lack of awareness of digital tools and limited access to investment finance in leap technology. Many women and girls in the region have therefore missed opportunities provided by this digital transformation. Women and girls have reported increased exposure to various forms of online violence.

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Source: Compiled by ESCWA.

Limited participation in global research

The pandemic instigated a global race for developing COVID-19 vaccines and therapeutics. The limited participation of the Arab region comes from low investment in research and development, whose expenditure as a proportion of GDP of the region is 0.6 per cent, which is less than half the global value of 1.7 per cent. The average of full-time researchers per million inhabitants for the Arab region is 577.3, whereas the world's value is 1,235.4. Disparities are noticeable between men and women in the science, technology, engineering and maths (STEM) fields. While the percentage of women enrolled in science studies in many Arab countries was similar to, and in some cases even exceeded, that of their male colleagues, the percentage of females among workers in the fields of science, technology and scientific research was estimated at less than 25 per cent. For example, 57 per cent of women in Saudi Arabia graduate with scientific specializations; however, they represent only 16 per cent of the total number of workers in research and development. In 2018, the percentage of females among research and development personnel was higher than 30 per cent in Tunisia (55.9 per cent), Algeria (41.6 per cent), Jordan (36.7 per cent), Bahrain (36.5 per cent) and Kuwait (35.5 per cent), whereas the percentage was lower than 20 per cent in Morocco (3.2 per cent), the United Arab Emirates (10.9 per cent), Iraq (14.2 per cent), Qatar (15.4 per cent) and Saudi Arabia (16 per cent).[a]

The Global Knowledge Index (GKI) was developed to help countries understand the requirements for, and challenges facing, the building of effective knowledge economies. The GKI sub-indices factor in human resources qualifications; information and communication technology (ICT); and research, development and innovation (RDI). In 2021, the United Arab Emirates ranked first in the Arab region (eleventh globally), followed by Qatar (thirty-eighth globally) and Saudi Arabia (fortieth globally). Arab countries have a lower performance in the RDI sub-index, with only five countries registering a higher average than the world's average (the United Arab Emirates, Qatar, Saudi Arabia, Lebanon and Egypt). The ICT sub-index shows a higher performance, with nine Arab countries scoring higher than the world's average (the United Arab Emirates, Kuwait, Bahrain, Saudi Arabia, Oman, Qatar, Egypt, Tunisia and Morocco).[b]

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Sources:

a UNESCO Institute of Statistics.
b UNDP and Mohamed bin Rashid Al Maktoum Knowledge Foundation, Global Knowledge Index, 2021.

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3   ITU, WSIS Stocktaking Special Report, 2020.

Measures taken by Arab Governments

Technology is vital in responding to the COVID-19 health crisis, and to implementing recovery efforts following the pandemic. The virus has triggered government action, expediting national efforts towards digital transformation, and promoting openness and transparency in government operations.

1. **E-services have been deployed and strengthened in several Arab countries to facilitate citizens' transactions during the pandemic.** In Egypt, digital transformation has been expedited, with a transition to smart digital work environments, digital inclusion and digital literacy. E-payment has also been deployed for mobile phone bills, coupled with incentives to use e-transactions and enhance access to telecommunication services. In the Syrian Arab Republic, an e-government portal was launched to reduce in-person public services, and an e-payment system was established to provide 18 services from 10 public entities. In Tunisia, the *E7mi* application was developed to track and detect COVID-19 cases.[4] It is connected to the database of the Ministry of Health, and relies on several technologies, including Bluetooth and encryption protocols, to protect personal information.

Role of technology in education during the pandemic

In a number of Arab countries, schools, universities and the Government have created innovative methods, tools and programmes to keep the education system operational. For example, through a ministerial resolution, Saudi Arabia has implemented distance learning for public and private universities, and tools and portals to ensure continued education for over 7 million students.[a] In the United Arab Emirates, distance learning has been implemented in schools and higher education institutions, and complemented with teacher training, free satellite broadband services for students in areas lacking connectivity and free home Internet connection for households without Internet.[b] In countries where Internet penetration remains low and where large numbers of households lack the hardware necessary to access online platforms, such as Yemen, traditional broadcast media such as radio and television were employed to reach as many students as possible.[c]

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Sources:

a Saudi Ministry of Education, The Saudi MOE, 2020.
b United Arab Emirates, Distance learning in times of COVID-19.
c UNICEF, Yemen's hidden emergency: An education system in crisis, 2021.

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2. **Strategies, policies and laws have been formulated and enacted.** For example, in Kuwait, a digital transformation strategy was published for public consultation, and the *Sanad* e-services gateway application was updated to include over 200 e-services to reduce in-person visits during the pandemic. In 2020, Jordan adopted a strategy for digital transformation, as did Saudi Arabia (Third Action Plan for 2020-2024),[5] Morocco (Morocco Digital 2025)[6] and Tunisia (Digital Tunisia 2020).[7] Tunisia also issued new e-government laws to facilitate e-payments, the exchange of data and teleworking; and developed a national electronic identifier. Other countries have adopted dedicated strategies for artificial intelligence namely Jordan, Qatar, Saudi Arabia and the United Arab Emirates. Digital economy strategies are also used as tools for economic diversifications, including in Saudi Arabia and the United Arab Emirates.

3. **Some Arab countries have launched digital or technology-focused initiatives to support the job market.** To ensure employment stability in the private sector of the United Arab Emirates, the country adopted the Virtual Labour Market to help the foreign workforce negatively impacted by pandemic response measures to explore new job opportunities. E-recruitment and job placement platforms were deployed in GCC countries to enhance the protection of temporary contractual workers. Qatar launched an initiative to support small and medium enterprises (SMEs), and facilitate their digital transformation to increase business efficiency during and after the pandemic. Realizing the particular disadvantage of women migrant workers, GCC countries, through the declaration of the Abu Dhabi Dialogue Ministerial Consultation 2021, committed to more research on current and future labour market demand for women workers in technology-related, technology-facilitated and other relevant sectors; and to map and analyse good practices to enhance the employability, mobility and labour force participation of women workers in country corridors.[8]

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4 https://e7mi.tn/index.html.

5 www.my.gov.sa/wps/portal/snp/aboutksa/digitaltransformation.

6 https://add.gov.ma/storage/pdf/Avril_NOG_ADD_fr_SITE_VF.pdf.

7 www.mtcen.gov.tn/index.php?id=14&L=2%27.

8 Abu Dhabi Dialogue Sixth Consultation, Joint Declaration, 2021.

4. **Countries have engaged in STI activities in response to the pandemic**. Some countries have engaged in research for or production of a COVID-19 vaccine. Algeria and Egypt partnered with China to produce the Sinovac vaccine,[9] and Morocco, Saudi Arabia and the United Arab Emirates partnered with China to support vaccine research, including advanced trial phases.[10] Research interest also extended to therapeutics. Bahrain, Egypt, Kuwait, Oman and Saudi Arabia participated in the WHO COVID-19 Solidarity Therapeutics Trial,[11] which was the largest global collaboration among countries on a randomized control trial for COVID-19 therapeutics. Five Arab countries, namely Egypt, Kuwait, Lebanon, Oman and Saudi Arabia, have joined the Solidarity Trial Plus that aims to find additional treatments for COVID-19.[12]

5. **Greater attention and investment were directed towards green technologies**. While not part of the immediate response to the pandemic, countries have included measures in their longer-term recovery plans to invest in green technologies, such as renewable energy. Saudi Arabia, for example, has declared its intention to collaborate with Germany on green hydrogen.[13, 14] Jordan has plans to install small solar power plants for at least 4,000 poor families. Both Algeria and Jordan have plans for electric mobility.[15, 16]

Most at risk of being left behind

A detailed review of the Arab region revealed that SDG technology targets will not be met by 2030 for the following social groups,[17] whose vulnerability has been amplified by the pandemic.

Groups and areas disadvantaged by the digital divide: In the Arab region, only 54.6 per cent of people use the Internet[18] and only 57.1 per cent of households have a computer.[19] The digital divide between urban and rural areas, and between men and women within countries, affects access to the Internet and its various services. In 2020, the share of women using a mobile was 47 per cent compared with 61 per cent for men,[20] thus impacting women's access to essential online goods and services, including education and health care, and their right to participate in public life. It is not yet clear how this picture is changing as a result of the pandemic and the increasing need to be digitally connected.

Digitally illiterate people: Digital literacy is crucial for the basic use of digital technology. Some people in the region still need training in basic ICT skill to take advantage of digital technology. According to the 2021 Network Readiness Index, the value of the ICT skills sub-indicator ranges from 61.25 for Saudi Arabia to 24.38 for Algeria.[21]

Countries with low levels of technological development and legal gaps: Some Arab countries still lack regulatory and ethical frameworks that protect individuals and the environment from being harmed as a result of inappropriate technology use. Only a few countries are using emerging technology to transform development sectors, such as agriculture, energy, transport and industry.

9   Arab News, After Sinovac, Egypt seeks to produce Moderna vaccine locally, 2021.

10 OECD, COVID-19 crisis response in MENA countries, 2020.

11 www.who.int/emergencies/diseases/novel-coronavirus-2019/global-research-on-novel-coronavirus-2019-ncov/solidarity-clinical-trial-for-covid-19-treatments.

12 ISRCTN Registry, Solidarity Trial Plus: An international randomized trial of additional treatments for COVID-19 in hospitalized patients who are all receiving the local standard of care, 2021.

13 Vivid Economics, The Greenness of Stimulus Index, 2021.

14 Green hydrogen is hydrogen fuel that is created using renewable energy instead of fossil fuels. It has the potential to provide clean power for manufacturing, transportation, and more - and its only byproduct is water.

15 www.premier-ministre.gov.dz/ressources/front/files/pdf/plans-d-actions/bilan-2021/Plan%20de%20relance%20%C3%A9conomique%202020-2024-fr.pdf.

16 www.greengrowthknowledge.org/sites/default/files/downloads/policy-database/20022_Jordan_Transport_v11_HL_Web.pdf.

17 ESCWA, Arab Sustainable Development Report, 2020.

18 ESCWA Arab SDG Monitor.

19 ITU, Measuring digital development: Facts and figures, 2019.

20 ITU, Measuring digital development: Facts and figures, 2021.

21 Portulans Institute, Network Readiness Index, 2021. The Index covers 12 Arab countries.

Persons with disabilities: In the Arab region, persons with disabilities do not always have suitable access to computers and the Internet nor to e-content that is adapted to their needs, and are at a higher risk of being digitally excluded.

Young people: The post-COVID-19 job market will demand a new set of skills, which may not be compatible with the majority of the 1.5 million young people who enter the informal sector annually.[22] Young people who live in underprivileged areas are the most vulnerable to being left behind, and the pandemic has further limited their prospects of receiving training.

Fourth Industrial Revolution

Countries are fostering the use of Fourth Industrial Revolution technologies, namely artificial intelligence (AI), through strategies and specialized national bodies. Examples include the National Programme for Artificial Intelligence of the United Arab Emirates[a] and the National Council for Artificial Intelligence of Egypt.[b] Several AI higher education programmes and AI incubators are being established, including the Faculty of Computers and AI at Cairo University[c] and the AI incubator at Alexandria University.[d] Although these examples are not in response to the pandemic, they build a strong digital ecosystem to mitigate the pandemic's impact. If a structured and phased approach is adopted, and Arab countries collaborate to build a robust ecosystem that supports this transformation, the region will be better able to weather future crises.

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Sources:

a https://ai.gov.ae/.
b https://mcit.gov.eg/en/Artificial_Intelligence.
c https://cu.edu.eg/Faculties.
d www.arabfinance.com/en/news/details/egypt-economy/517405.

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22   www.arabstates.undp.org/content/rbas/en/home/coronavirus/socio-economic-impact-of-covid-19.html.

Policy recommendations on technology for ensuring an inclusive recovery and achieving SDG 17 by 2030

The following recommendations have been identified to accelerate the achievement of SDG 17 in the region and support action on other SDGs. These recommendations also facilitate the COVID-19 recovery and enhance resilience to future shocks and crises.[23]

- Ensure inclusive and safe access to technology, equitable to men and women and all demographics; and accelerate the digital transformation of the public and private sectors, including by improving ICT infrastructure and strengthening broadband services.

- Prioritize and invest in building the absorptive capacity of populations, including migrants and refugees, to use, adapt, customize and develop technology applications according to development needs.

- Introduce strategies to improve research and development, and strengthen the local technological capacity of researchers, innovators and entrepreneurs, especially women and young people, communities of practice, policymakers and the media.

- Invest in research and development that target technological solutions to the gendered challenges of sustainable development.

- Implement measures to reduce the gender gap between men and women in STEM jobs by providing incentives to women STEM graduates and raising public awareness of this issue.

- Facilitate the emergence and establishment of SMEs and encourage entrepreneurship in its various types, including social entrepreneurship, and fields such as agritech and healthtech, by implementing an entrepreneurship ecosystem that allows access to investment and provides growth potential and integration into value chains.

- Promote the use of digital and emerging technologies in development sectors, including the health, agricultural, energy and transport sectors; and promote artificial intelligence and build an enabling environment for it, including by developing sectoral strategies and ethical frameworks.

- Increase investments and regional collaboration for the transfer of green technologies, and the development and implementation of guidelines and mechanisms for the utilization and procurement of such technologies.

- Revitalize the global commitment to supporting developing countries through related instruments, including the Technology Facilitation Mechanism.

Technology Facilitation Mechanism

The Technology Facilitation Mechanism was launched within the framework of the 2030 Agenda for Sustainable Development to leverage technology for implementing the SDGs. It is intended to facilitate multi-stakeholder collaboration and partnerships by sharing best practices, experiences and policy advice. The wealth of knowledge available through the mechanism can help inform decision makers in the Arab region on innovations and technological pathways.

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Source: https://sdgs.un.org/tfm.

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23 Further information is available in the SDG 17 chapter of the ESCWA, Arab Sustainable Development Report, 2020.

Key facts on SDG 17 - Technology
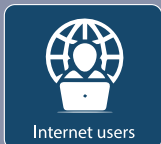
	Arab region	World
Fixed Internet broadband subscriptions per 100 inhabitants		
Broadband subscriptions	**8.1** per 100 inhabitants had fixed broadband subscription in 2020 **+23 per cent since 2005**	**15.2** per 100 inhabitants had fixed broadband subscription in 2020 **+10 per cent since 2005**
Internet users per 100 inhabitants		
Internet users	**54.6** per 100 inhabitants were Internet users in 2019 **+13 per cent since 2005**	**51.4** per 100 inhabitants were Internet users in 2019 **+8 per cent since 2005**
Proportion of the population covered by mobile network		
Mobile network	**90.8** per cent of the population was covered by 3G mobile network in 2020 **+3 per cent since 2015**	**93.1** per cent of the population was covered by 3G mobile network in 2020 **+3 per cent since 2015**
Proportion of the population with primary reliance on clean fuels and technology		
Clean fuels and technology	**87** per cent of the population had access to clean fuels and technology in 2019 **+1 per cent since 2000**	**66** per cent of the population had access to clean fuels and technology in 2019 **+1 per cent since 2000**
Proportion of medium and high-tech industry value added in total value added		
Tech industry	**30.9** per cent of total value added was medium and high-tech industry in 2018 **+0.98 per cent since 2000**	**45.1** per cent of total value added was medium and high-tech industry in 2018 **-0.17 per cent since 2000**
Research and development expenditure as a proportion of GDP		
Researchers	**0.6** per cent of GDP was spent on research and development in 2018 **+2 per cent since 2000**	**1.7** per cent of GDP was spent on research and development in 2018 **+0.72 per cent since 2000**
Full time researchers per million inhabitants		
Researchers	**577.3** full time researchers per million inhabitants in 2018 **+2 per cent since 2000**	**1,235.4** full time researchers per million inhabitants in 2018 **+2 per cent since 2000**

Source: ESCWA, Arab SDG Monitor (figures have been rounded).