



SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

The Arab region has yet to take comprehensive steps to shift towards sustainable and inclusive industrialization, in a context of struggling economies, rising unemployment and inefficient and unsustainable use of natural resources. Infrastructure needs are vast, especially in the least developed countries, and the region has the weakest degree of economic integration in the world. It also has the lowest levels of innovation based on investment in and the productivity of research and development (R&D). Prioritizing innovation, moving forward with regional integration and enhancing the resiliency of infrastructure demand comprehensive policy shifts and related investments and instruments. They also require political will committed to embracing the different dimensions of sustainable development, and the fundamental connectivity of systems, goods, communities and peoples across the region.

Key facts

Investment in infrastructure

In 2012, the estimated investment required for reliable, robust, safe and resilient infrastructure in the Arab region was up to \$100 billion.¹ Increasing conflict since then has magnified the need, given the deterioration and physical destruction of roads, buildings, water networks, electricity grids and telecom networks in a number of countries. In the Syrian Arab Republic alone, by 2017, an estimated \$117.7 billion² in housing and infrastructure had been destroyed.



The ratio of public roads per 100,000 persons in the region is four times less than the world average. Railway interconnectivity is weak and, in many cases, entirely absent.³



The use of trucks to move goods across countries incurs time losses of around 57 per cent of the total journey. This is due to border crossings, control and inspection. The loss results in additional expenses of 38 per cent of the journey's original cost.⁴



The rate of carbon dioxide pollution from manufacturing in the region, in proportion to the value added of industry, is the worst in the world, at four times the global value.⁵

Manufacturing 9.6% of GDP

In 2017, manufacturing value added as a share of GDP was the second lowest in the world at 9.6 per cent compared to a world average of 16.4 per cent. It ranged from 0.87 per cent in Iraq to 15.65 per cent in Tunisia.⁶

10%

In 2017, employment in manufacturing in the region constituted 10.18 per cent of total employment.⁷



Since 2013, the region has doubled its ratio of gross domestic R&D expenditure to GDP. Expenditure remains around 60 per cent less than the world average, however, with sharp discrepancies among subregions.⁸



The regional average of full-time equivalent researchers is 744 per 1 million inhabitants, less than 60 per cent of the global average of 1,267.⁹ The United Arab Emirates, among GCC countries, and Morocco and Tunisia, among Maghreb countries, lead the region in the number of researchers.¹⁰ The share of women researchers is high in some countries, such as Bahrain at 41 per cent and Egypt at 43 per cent in 2013.¹¹



The proportion of small-scale industries with access to a loan or credit is less than 16 per cent, considerably lower than in other regions worldwide.¹²



Mobile network coverage in the region exceeds the world average. The GCC countries have almost reached the 2020 target of 100 per cent of the population covered by at least a 2G network. The Arab least developed countries, however, are very far behind.¹⁶

High-tech industry

Among the GCC countries, the proportion of medium and high-tech industry value added was 33.7 per cent in 2016, more than double the proportion in the Mashreq (15 per cent) and Maghreb (9.9 per cent). Qatar led the region at 66.9 per cent and exceeded the global average of 45.6 per cent.¹³



By 2018, mobile telephone penetration rates in the region had reached a saturation point of 100.2 per 100 inhabitants. From 2010 to 2018, the number of active mobile-broadband subscriptions increased almost eight times, reaching 60.2 per 100 inhabitants. The share of individuals using the Internet remains at around 50 per cent, however.¹⁷



Where data are available for middle- and low-income countries of the region, women are 20 per cent less likely than men to use the Internet on mobile

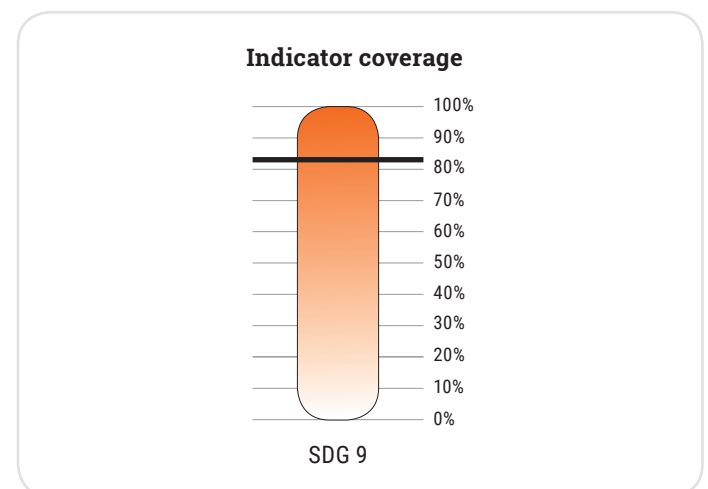
devices.¹⁴ Except for Qatar, the number of women and girls using the Internet is always less than the number of men and boys.¹⁵

Measuring SDG 9 in the Arab region according to the global SDG indicator framework

Data are available for 10 out of 12 indicators, covering all 8 targets under SDG 9.

Despite relatively high data availability, a number of challenges pertain to the indicators globally articulated for SDG 9. These need to be addressed to allow policymakers to better guide progress towards achieving all aspects of the goal:

- SDG 9 covers infrastructure at the goal and target levels (9.1, 9.4 and 9.a) but focuses only on transportation at the indicator level. Capturing the role of infrastructure in development requires observing aspects covered by other goals, including health infrastructure (SDG 3), water infrastructure (SDG 6), energy infrastructure (SDG 7) and adapted infrastructure for students with disabilities (SDG 4). Infrastructure as an essential element of sustainable economic productivity (SDG 8) is not captured.
- Indicators under target 9.1 focus on use, affordability and access to transportation infrastructure, with no measurement of quality, reliability, sustainability or resilience. The indicators do not allow for assessments of infrastructure disruption and



losses due to disasters or of infrastructure resilience to disasters.

- Indicators related to R&D focus only on inputs such as funding and personnel. It would also be useful to look at output indicators, such as the numbers of patents and articles published, to assess the extent to which innovation has an impact at the national, regional and even global levels.

- Analysis of gender dimensions in SDG 9 indicators categorizes them as “not gender specific” or “gender blind”.¹⁸ Sex-disaggregated data are necessary, however, to provide a comprehensive picture of the impact and role of SDG 9 in the Arab region.

Such data would be particularly useful in measuring indicator 9.2.2 on manufacturing employment as a proportion of total employment as well as 9.5.2 on researchers.

SDG 9 CONTAINS ONE TARGET TO BE ACHIEVED BY 2020

TARGET 9.C - Significantly increase access to information and communications technology and strive to provide

universal and affordable access to the Internet in least developed countries

The main barriers to building resilient infrastructure, promoting inclusive and sustainable industrialization and fostering innovation in the Arab region

Although there are higher levels of investment in GCC countries, the Arab region generally faces overwhelming demand for new and updated infrastructure given increased population growth and urbanization, and rising inequality (SDG 10). Urban slums are a major challenge in many cities, and poor infrastructure further marginalizes entire urban and rural communities, which lack access to adequate water and sanitation services, and contend with intermittent access to electricity (SDGs 6, 7 and 11). These conditions exacerbate the impact of poverty and negatively affect human health as well as the availability and quality of health-care services (SDGs 1 and 3). Poor transport and insecure access to energy or telecommunications networks impede entrepreneurship and livelihoods, and limit employment and school enrolment in some areas, especially for girls and women (SDGs 4, 5 and 8).

Innovation is fundamental for the region to transition to increased, inclusive and sustainable industrialization. Yet efforts towards this end remain fragmented. Innovative solutions are needed across the region to close gaps in sustainability, including to raise the efficiency and productivity of land and water use, and curb food waste and loss (SDGs 6, 15 and 2). Investment in R&D has yet to reach levels necessary to strengthen the science-policy interface, build the capacities of a large unemployed youth population and absorb them into the labour force (SDGs 4, 8 and 17). Much more could be done to channel innovation to shore up defences against climate change, given the region’s vulnerability to rising temperatures, desertification and worsening pollution (SDGs 12 and 13).

The three elements of SDG 9, resilient infrastructure, sustainable industrialization and innovation, reinforce each other. While resilient infrastructure is necessary for sustainable industrialization, the latter will also spur investment in the former. Likewise, investment

Everyone will benefit greatly from improved infrastructure, including safer transport, enhanced water and sanitation services, and better schools and hospitals. Such improvements are often critical to reaching and reducing the vulnerabilities of **marginalized populations**, such as women and girls, older persons, persons with disabilities, and people who are poor, including in remote locations.

Subregional discrepancies in ICT infrastructure result in issues with seamless connectivity and speed as well as higher costs. Two GCC countries, Qatar and the United Arab Emirates, have the highest penetration of “fibre to the home or building” technologies, which provide high-speed broadband Internet access. Arab least developed countries, on the other hand, are considerably behind in fixed and mobile telephony.

Source: ESCWA, 2019a.

in innovation and research can improve infrastructure and industrialization, but is predicated on resilient infrastructure. Innovation increases where industry is robust and provides incentives. The performance of the private sector, however, with its potential to drive industry and innovation and invest in infrastructure, remains uneven in the region.

The region’s slow economic growth, low productivity, high unemployment and reliance on oil and rents have put it behind on most SDG 9 targets. Two subregions face their

own additional challenges. While GCC countries have invested heavily in improving infrastructure and have highly developed systems, they have the highest carbon dioxide emissions per unit of manufacturing value added in the world, undercutting the achievement of sustainability

integral to SDG 9 and the 2030 Agenda as a whole. Meanwhile, the least developed countries lag well behind others in their levels of industrialization as well as in their ability to finance and invest in necessary infrastructure, including essential services.

Weak regional integration is evident in great disparities hidden within already low regional averages for infrastructure. For example, when considering freight volume by road, country figures range from 840,000 ton-kilometres in Comoros and 1 billion ton-kilometres in Djibouti to 116 billion ton-kilometres in Saudi Arabia.

Source: Compiled by ESCWA based on United Nations Statistics Division, 2019a.

Science, technology and innovation policies in Arab States have generally failed to catalyse knowledge production effectively or add value to products and services because they focus on developing R&D without taking the business community on board. Many Arab universities are simply not research oriented. The research activity of teaching staff in public and most private universities is in the range of 5 per cent to 10 per cent of their total academic duties, compared to 35 per cent to 50 per cent in European and American universities.

Source: UNESCO, 2015b.

THE FOLLOWING ARE THE KEY BARRIERS TO ACHIEVING SDG 9 IN THE ARAB REGION

The structure of economies and dominance of low-productivity sectors

While economic diversification has taken place in both oil-rich and oil-poor countries, it has not provided sufficient decent work. Labour productivity has barely budged. Economic growth has been slow, stagnant or negative, and benefits have been unevenly shared.

Currently, manufacturing value added as a proportion of GDP in the region is the second lowest in the world at 9.6 per cent, compared to a world average of 16.4 per cent.¹⁹ Governments (non-market services) remain the largest employers in the region, followed by agriculture in non-oil-exporting countries and market services in oil-exporting countries.

In addition, the potential of the private sector to spur and invest in industry, infrastructure and innovation, and to lead the region in the field of technology, remains stunted. This is despite some successful attempts, for example, in the power and water sectors in oil-rich countries.²⁰ In some countries, the proximity of private sector entities to public figures in government renders the latter's role less clear cut, making it difficult to introduce or enforce regulations, and guarantee sustainability and resilience among business initiatives. Where the business ecosystem is cumbersome and outdated, it fails to attract or facilitate private sector activities or public-private partnerships, or to improve competitiveness.



Weak commitment to economic integration at multiple levels

Resilient infrastructure, sustainable industrialization and investment in innovation are indicators of integration into regional and global economies and the fourth industrial revolution. Yet regional integration, assessed as the volume of trade among Arab countries, is the weakest in the world. The region has yet to take concrete steps to harmonize regulations, prioritize regional value chains, or support the emergence of a common market and common currency. These and other actions impact regional and national development trajectories.

Some Arab countries have developed high-quality expressways between major cities, but road density in the region remains low.²¹ Poorly integrated regional infrastructure, including for transport, power and logistics, undermines regional economic integration. Political tensions among countries have further jeopardized the mobility of goods and services, and hampered regional and subregional integration.



The disconnect between research and developmental needs

Compared with the rest of the world, the region has a poor record of association between R&D expenditure and GDP growth, and harnessing innovation to create jobs, and improve industries and services. Despite promising efforts to boost R&D and innovation in several countries, limitations on academic freedom and funding mean that the interface between the academy, science and industry remains anaemic. The current state of education, especially public education, does not serve a transition to innovative research and industry. R&D priorities need to be integrated in educational reform to encourage creativity and innovation, and the uninhibited search for knowledge.



Existing strategies for R&D are sector specific or non-inclusive, or have a short timeline with no emphasis on identifying a country's niches and needs. Collaboration among researchers is limited despite common research areas such as renewable solar energy. While scientific publishing rose between 2005 and 2014, with strong growth in Egypt, Qatar and Saudi Arabia, the region's share of world publications is only 2.4 per cent.²² In 2013, the Arab States' share of patents submitted globally was 0.2 per cent.²³

Inadequate industrial and business policies

Small-scale industries suffer from an inefficient and uncondusive regulatory environment, limitations in private investment, and barriers in access to financing, particularly credit. Among Arab countries, the United Arab Emirates may have the most conducive environment for doing business, ranking eleventh globally in 2019. Seventeen Arab countries are ranked 60th or below. Iraq, Libya, Somalia, the Syrian Arab Republic and Yemen are among the most difficult countries globally for doing business.²⁴

The region particularly underperforms in access to credit, with a gap that is the largest in the world. This poses a critical challenge to small and medium enterprises. While they comprise about 96 per cent of registered companies and provide about half of employment, they account for only 7 per cent of total bank lending, the lowest level in the world.²⁵ Access to other financial services such as equity and fintech also remains limited.²⁶ Some countries have made progress. For example, in Morocco, Tunisia and Lebanon, the proportion of small-scale industries with a loan or line of credit stands at 48 per cent, 40 per cent and 38 per cent, respectively. This compares to 4 per cent in Egypt and 13 per cent in Jordan. The difference stems from targeted policy choices supported by central banks.²⁷ Arab countries also show the largest gender gap in access to formal financial services, with 52 per cent of men and only 35 per cent of women having an account with a bank or mobile money provider.²⁸

Business parks, incubators, accelerators and different types of venture capital are growing, particularly in the Mashreq and Maghreb subregions. Venture capital, however, remains focused on seed funding for start-ups, on the lower end of funding, or private equity on the upper end, leaving out financing for small and medium enterprises.²⁹



Conflict

Conflict has resulted in the breakdown of R&D systems, physical destruction of infrastructure and stalled manufacturing. In Yemen, the systematic destruction of vital infrastructure and the blockade resulted in famine and epidemics. Major industrial zones have been destroyed in the Syrian Arab Republic, with 70 per cent of industrial buildings demolished in Aleppo, once a manufacturing hub for pharmaceuticals, textiles, garments, chemicals and agro-processing.³⁰ Sabotage and terrorist attacks on energy infrastructure have in recent years been reported in Egypt, Iraq, Libya, the Syrian Arab Republic and Yemen.³¹

Conflict poses a major barrier to regional integration, including through spillover effects on neighbouring countries. Crises and unstable security situations have led to uncertainty in land border access. Land border closures result in direct and indirect impacts on economic activities and the movement of goods. Finding alternate routes for exporting goods through maritime transport and airfreight leads to financial and logistical burdens for producers and governments.



ICT uptake is progressing rapidly in the GCC countries, where Qatar and the United Arab Emirates are among the top 10 global adopters of technology. Progress is also occurring in the Mashreq and Maghreb, but moving much more slowly in the least developed countries. At the regional level, however, all Arab countries have been mostly consumers and importers of technology, with limited customization to local needs and principles of inclusive, sustainable development. Without technological adaptation and the cultivation of digital content that is research-guided and needs-oriented, the benefits that technology can bring to development will be lost. Shortfalls could be felt in the productive sectors, social welfare, health care, education, management of natural resources, precision agriculture, disaster risk reduction and other areas.

Source: World Economic Forum, 2018.

At risk of being left behind

Without infrastructure and connectivity improvements, communities in **rural areas and informal settlements** face difficulties in accessing information as well as essential services such as for health care, education, and water and sanitation. There are notable disparities in the quality and availability of infrastructure and connectivity between urban and rural areas in most Arab countries, particularly in the least developed countries.

Despite the rise in the number of female graduates in the science and technology fields, **women** remain underrepresented in employment in these sectors. More significantly, changing requirements for employment in industry and increased automation will affect low-skilled jobs where women are often concentrated. Rising demand for higher-level skills in science, technology, engineering and math (STEM) could help bridge the gap.

Some **groups are affected by digital divides**. These exist between urban and rural areas, men and women, different age groups, and the rich and poor. People who are digitally left behind will not have access to e-services, information and other benefits of technology. ICT data are not yet disaggregated according to different population groups, although there have been recent and ongoing efforts to develop gender-disaggregated ICT data. As governments and industries advance technology, groups currently on the wrong side of the digital divide will need tailored capacity-building and deliberate, phased approaches to ensure they are not fully marginalized as producers and consumers of products and services.

Many people in the **least developed countries** are being left behind on SDG 9. Structural and financial limitations make it difficult for these countries to invest in infrastructure or catch up on technology. For example, while countries in the region have near universal access to electricity, the least developed countries have levels below 50 per cent and as low as 30 per cent in Somalia and 38 per cent in the Sudan. Several subregional electricity interconnection systems

are in place in the Mashreq and Maghreb and for the GCC countries, but these unfortunately bypass the least developed countries. They miss out on a cost-effective and secure electricity supply, access to clean energy and greater job opportunities.³² Challenges also arise in making technologies affordable to interested users. The subregional average of total official flows for infrastructure (indicator 9.a.1) is notably lower in the least developed countries than in the Mashreq and Maghreb subregions.

According to the latest data, in Saudi Arabia and Kuwait only 2.2 per cent and 4.2 per cent of total employees in industry were **women**, respectively. In Algeria and Tunisia, women's share was up to 23.6 per cent and 33.1 per cent, respectively. In 10 Arab countries, women represent between 34 per cent and 57 per cent of tertiary graduates in science, engineering and agriculture.

Sources: UNESCO, 2015b; ILO, 2019.

What the region can do to accelerate progress on SDG 9

1. Take serious steps towards economic integration:

- Revitalize commitment to regional integration, and align national development plans and efforts to harmonize cross-border regulations, streamline logistics and tariff systems, and facilitate the mobility of people and goods.
- Develop multimodal transportation systems, regional electric grids and a regional Internet structure (regional backbone and exchange points) that connect Arab countries regionally and to global networks.

2. Shift from sectoral manufacturing to integrated, sustainable industrial policies:

- Invest in the circular economy and production, and move manufacturing towards a virtuous cycle driven by green industry and clean technologies.
- Prioritize efficient consumption of environmental goods to reduce and recycle waste.
- Invest in building skills needed for new industries, avoid premature deindustrialization and remedy possible job losses due to automation.

- Develop instruments to support environmentally safe industrial production, such as public procurement, tax exemptions, tariffs and fees, green procurement and trade schemes.³³
- Improve the ecosystem for private sector contributions across industry, infrastructure and innovation, including through regulatory and legislative frameworks to facilitate investment and partnerships.
- Introduce or enhance the necessary compliance mechanisms for private sector entities to enhance sustainability and resilience, and generate decent work.

3. Develop and operationalize coherent science, technology and innovation policy frameworks:

- Develop a plan of action for regulatory interventions, incentives and multistakeholder engagement, and foster a stronger role for women and youth in R&D and STEM fields.
- Identify niche interventions to inform future research agendas.

- Strengthen stakeholder partnerships to support industry, South-South cooperation and technology transfer.
- Integrate science, technology and innovation into national development plans, and monitor implementation and progress through specific indicators.
- Introduce mechanisms to strengthen the science-policy interface across all levels of government, including legislative bodies, and introduce and enforce access to information laws.
- Support regional multistakeholder knowledge-sharing platforms to promote the potential of industry 4.0 (interconnectivity, automation, machine learning and real-time data), and design related training programmes.

4. Innovate:

- Strengthen innovation with a focus on research across sectors and disciplines.
- Create an enabling environment and improve innovation ecosystems, promote entrepreneurship and facilitate the creation of start-ups.
- Expand access to credit and financial services especially for small and medium enterprises, women and youth.
- Enhance collaboration among countries on R&D, harmonize and streamline the exchange of knowledge and expertise among universities and research centres, and support regional research programmes.

SDG 9 targets and indicators in the Arab region

Target

9.1
Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all

Indicator

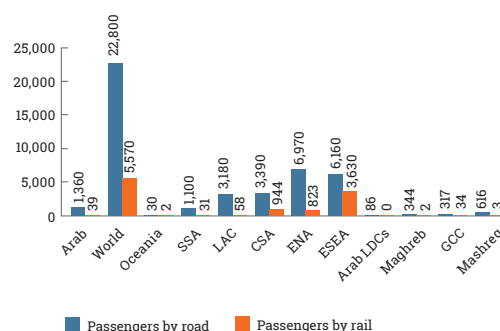
9.1.1
Proportion of the rural population who live within 2 kilometres of an all-season road

9.1.2
Passenger and freight volumes, by mode of transport*

Data

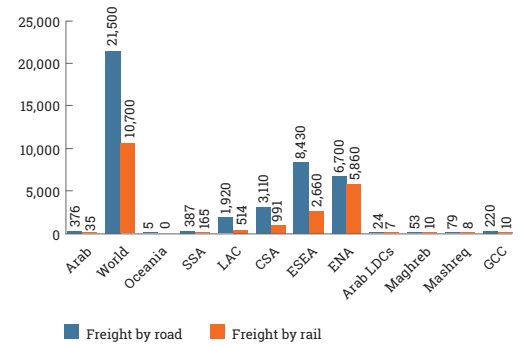
Adopted criteria to obtain a regional average are not met for this indicator.

Figure 1 Passenger volume by road and rail transport (billions of passenger kilometres)



Note: Aggregates are the total sum of country values. The calculated Arab regional aggregates include the data values of all 22 Arab countries in 2017.

Figure 2 Freight volume by road and rail transport (billions of tonne-kilometres)



Note: Aggregates are the total sum of country values. The calculated Arab regional aggregates include the data values of all 22 Arab countries in 2017.

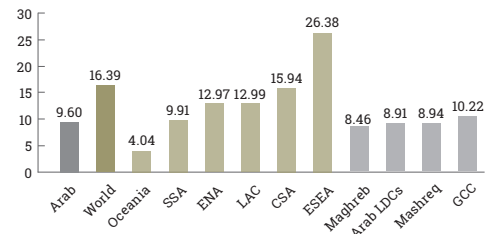
9.2

Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries

9.2.1

Manufacturing value added as a proportion of GDP and per capita**

Figure 3 Manufacturing value added as a proportion of GDP (percentage)

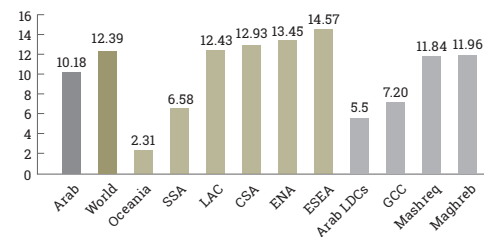


Note: All means are weighted by constant 2010 GDP in United States dollars (i.e., the denominator) for 2017, taken from the World Bank's World Development Indicators. The calculated Arab regional aggregate includes the data values of 19 Arab countries in 2017.

9.2.2

Manufacturing employment as a proportion of total employment**

Figure 4 Manufacturing employment as a proportion of total employment (percentage)



Note: All means are weighted by constant 2010 GDP in United States dollars (i.e., the denominator) for 2017, taken from the World Bank's World Development Indicators. The calculated Arab regional aggregate includes the data values of 19 Arab countries in 2017.

9.3

Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets

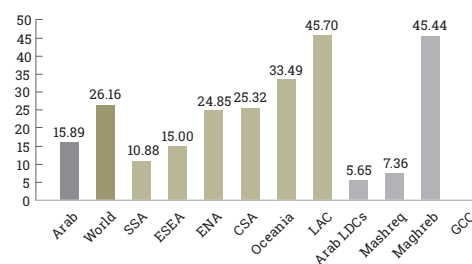
9.3.1

Proportion of small-scale industries in total industry value added

Adopted criteria to obtain a regional average are not met for this indicator.

9.3.2 Proportion of small-scale industries with a loan or line of credit

Figure 5 Proportion of small-scale industries with a loan or line of credit (percentage)

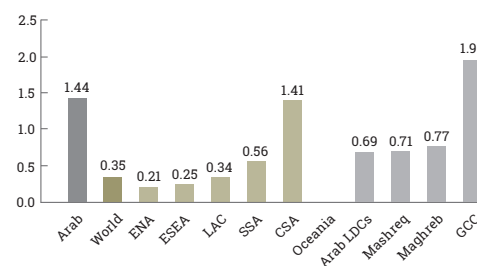


Note: All means are weighted by constant 2010 GDP in United States dollars (i.e., the denominator) for 2013, taken from the World Bank's World Development Indicators. The calculated Arab regional aggregate includes the data values of the following Arab countries and years: Iraq (2011), Jordan, Lebanon, Morocco, Tunisia and Yemen (2013), Mauritania (2014), and Egypt (2016). According to the United Nations Statistics Division (2019b), "this indicator shows how widely financial institutions are serving the 'small-scale industries'. Together with indicator 9.3.1, this indicator reflects the main message of target 9.3 which promotes to increase the access of "small-scale industries" to financial services".

9.4
By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities

9.4.1 Carbon dioxide emission per unit of value added

Figure 6 Carbon dioxide emissions per unit of manufacturing value added (kilogrammes of carbon dioxide per constant 2010 United States dollars)

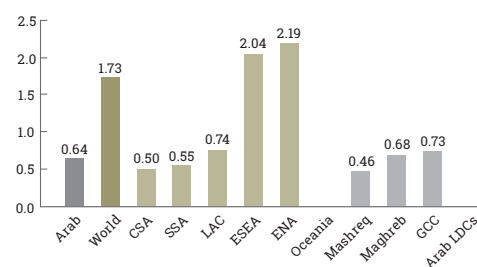


Note: All means are weighted by constant 2010 manufacturing value added in United States dollars (i.e., the denominator) for 2015, taken from the World Bank's World Development Indicators. The calculated Arab regional aggregate includes the data values of the following Arab countries in 2015: Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, United Arab Emirates and Yemen.

9.5
Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending

9.5.1 Research and development expenditure as a proportion of GDP

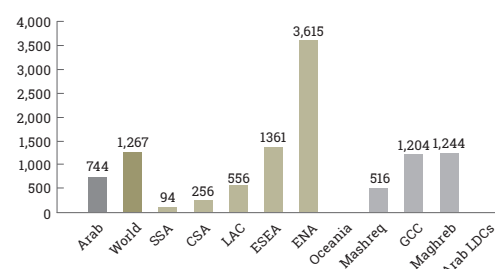
Figure 7 Research and development expenditures as a proportion of GDP (percentage)



Note: All means are weighted by constant 2011 PPP GDP in international United States dollars (i.e., the denominator) for 2015, taken from the World Bank's World Development Indicators. The calculated Arab regional aggregate includes the data values of the following Arab countries and years: Morocco (2010), Kuwait, Saudi Arabia and State of Palestine (2013), Bahrain (2014), Oman, Qatar and Tunisia (2015), and United Arab Emirates (2016).

9.5.2 Researchers (in full-time equivalent) per million inhabitants

Figure 8 Number of researchers in full-time equivalent (per 1 million inhabitants)

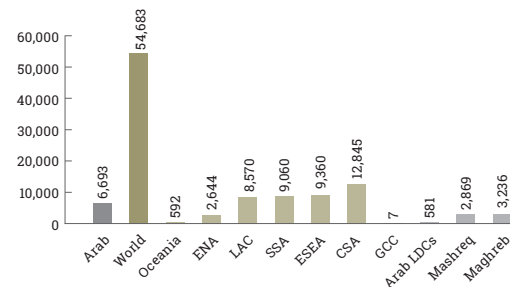


Note: All means are population weighted using the latest (2015) population estimates (United Nations Population Division, 2017; United Nations Statistics Division, 2019b). The calculated Arab regional aggregate includes the data values of the following Arab countries and years: Kuwait (2012), State of Palestine (2013), Bahrain (2014), Oman, Qatar and Tunisia (2015), Egypt, Iraq, Jordan, Morocco and United Arab Emirates (2016).

9.a
Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States

9.a.1 Total official international support (official development assistance plus other official flows) to infrastructure

Figure 9 Total official flows for infrastructure, by recipient countries (millions of constant 2017 United States dollars)

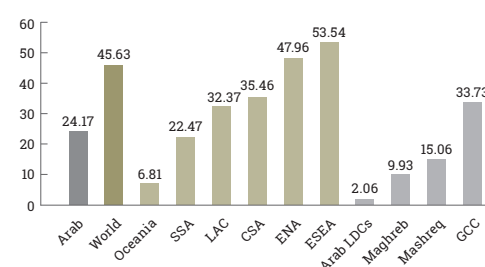


Note: Aggregates are the total sum of country values. The calculated Arab regional aggregate includes the data values of the following Arab countries and years: Oman (2010), Algeria, Comoros, Djibouti, Egypt, Iraq, Jordan, Lebanon, Libya, Mauritania, Morocco, Somalia, State of Palestine, Sudan, Syrian Arab Republic, Tunisia and Yemen (2017).

9.b
Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities

9.b.1 Proportion of medium and high-tech industry value added in total value added

Figure 10 Proportion of medium and high-tech industry value added in total value added (percentage)

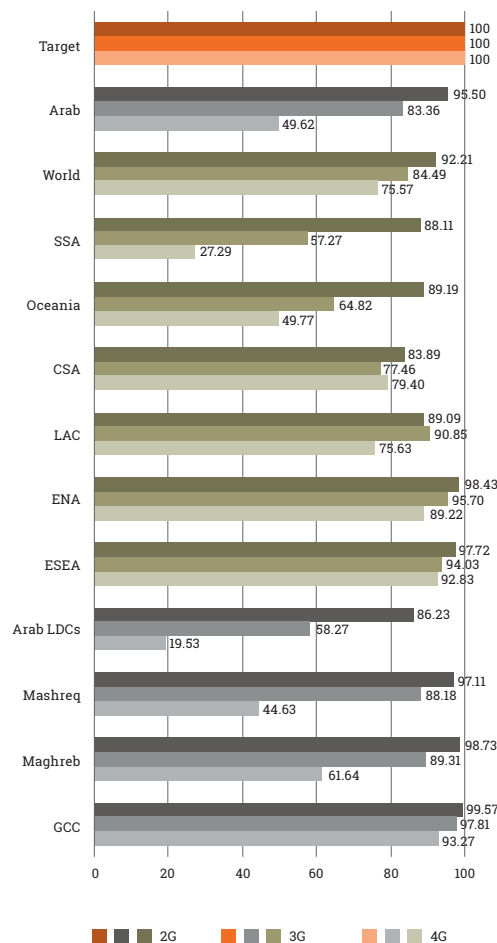


Note: All means are weighted by constant 2010 manufacturing value added in United States dollars (i.e., the denominator) for 2016, taken from the World Bank's World Development Indicators. The calculated Arab regional aggregate includes the data values of the following Arab countries in 2016: Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, State of Palestine, Tunisia, United Arab Emirates and Yemen. According to the United Nations Statistics Division (2019b), "The proportion of medium and high-tech industry (MHT) value added in total value added of manufacturing (MVA) is a ratio value between the value added of MHT industry and MVA. Industrial development generally entails a structural transition from resource-based and low technology activities to MHT activities. A modern, highly complex production structure offers better opportunities for skills development and technological innovation. MHT activities are also the high value addition industries of manufacturing with higher technological intensity and labour productivity. Increasing the share of MHT sectors also reflects the impact of innovation".

9.c
Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020

9.c.1
Proportion of population covered by a mobile network, by technology

Figure 11 Proportion of population covered by at least a 2G mobile network, at least a 3G mobile network, and at least a 4G mobile network (percentage)



Note: All means of the three series were population weighted using the latest (2015) population estimates (United Nations Population Division, 2017; United Nations Statistics Division, 2019b).

2G coverage: The calculated Arab regional aggregate includes the data values of the following Arab countries and years: Djibouti (2012), Libya (2013), Somalia (2014), Iraq, Lebanon (2015), Algeria, Bahrain, Egypt, Jordan, Kuwait, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, State of Palestine, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates and Yemen (2016).

3G coverage: The calculated Arab regional aggregate includes the data values of all Arab countries in 2016, except Comoros.

4G coverage: The calculated Arab regional aggregate includes the data values of all Arab countries in 2017, except the State of Palestine (2016).

* Besides the connectivity of infrastructure, indicator 9.1.2 also reflects the size of an economy and the number of people living in a particular country or region. Therefore, the interpretation of the presented numbers is not as simple as higher is necessarily better; numbers should be considered relative to the country/region's size and needs.

** According to the United Nations Statistics Division (2019b), "Manufacturing value added (MVA) as a proportion of gross domestic product (GDP) is a ratio between MVA and GDP, both reported in constant 2010 USD. MVA is a well-recognized and widely used indicator by researchers and policy makers to assess the level of industrialization of a country. The share of MVA in GDP reflects the role of manufacturing in the economy and a country's national development in general." Moreover, the metadata affirm that "the share of manufacturing employment in total employment represents the contribution of manufacturing in job creation" (ibid.). Indicators 9.2.1 and 9.2.2 are interpreted differently for developed and developing countries. For a developing country and for each of the two indicators, the higher the value the better the performance. In a developed/industrial country, for performance to be considered good, when the second indicator is high, the first should also be high, but when the second indicator is low, the first can either be low or high depending on the structure of the economy (e.g., if the economy relies on or promotes capital-intensive instead of labour-intensive industry, etc.).

Note: Central and Southern Asia (CSA); Eastern and South-Eastern Asia (ESEA); Europe and Northern America (ENA); Gulf Cooperation Council (GCC); Latin America and the Caribbean (LAC); Arab Least Developed Countries (Arab LDCs); Oceania (excluding Australia and New Zealand); Sub-Saharan Africa (SSA).

All figures are based on the Global SDG Indicators Database (United Nations Statistics Division, 2018) except for the inclusion of updated data (United Nations Statistics Division, 2019a) for the following indicators: 9.1.2 [Passenger and freight volumes, by mode of transport], 9.2.1 [Manufacturing value added as a proportion of GDP and per capita], 9.a.1 [Total official flows for infrastructure (millions of constant 2016 United States dollars)], 9.b.1 [Total official flows for infrastructure, by recipient countries (millions of constant 2017 United States dollars)], and 9.c.1 [Proportion of population covered by at least a 2G mobile network, covered by at least a 3G mobile network, and covered by at least a 4G mobile network (percentage)].

ENDNOTES

1. World Bank, 2012. The statement refers to regional country groupings as indicated in the reference.
2. ESCWA, 2019d.
3. ESCWA, 2017a.
4. Ibid.
5. Calculated by ESCWA, see figure 6.
6. Calculated by ESCWA, see figure 3.
7. Calculated by ESCWA, see figure 4.
8. Calculated by ESCWA, see figure 7. Also see UNESCO, 2015b.
9. Calculated by ESCWA, see figure 8.
10. For more on country values, refer to the annex complementing this report.
11. Zou'bi and others, 2015.
12. Calculated by ESCWA, see figure 5.
13. Calculated by ESCWA, see figure 10. For more on country values, refer to the annex complementing this report.
14. GSMA, 2019.
15. ITU, 2019.
16. Calculated by ESCWA, see figure 11.
17. ITU, 2018. Values are for 2018.
18. UN Women, 2018; UN Women and the United Nations Department of Economic and Social Affairs, 2019.
19. Calculated by ESCWA, see figure 3.
20. ESCWA, 2013.
21. ESCWA, 2017a.
22. UNESCO, 2015b.
23. UNESCO, 2015a.
24. World Bank, 2019.
25. Azour, 2019.
26. For more information, see Saleem, 2017; Rocha, Arvai and Farazi, 2011.
27. For details on country figures, refer to the annex complementing this report.
28. World Bank, 2018.
29. ESCWA, 2018.
30. World Bank, 2017.
31. ESCWA, 2019b.
32. Calculated by ESCWA, based on United Nations Statistics Division, 2019a. Refer also to SDG 7 in this report.
33. ESCWA, 2019c.

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