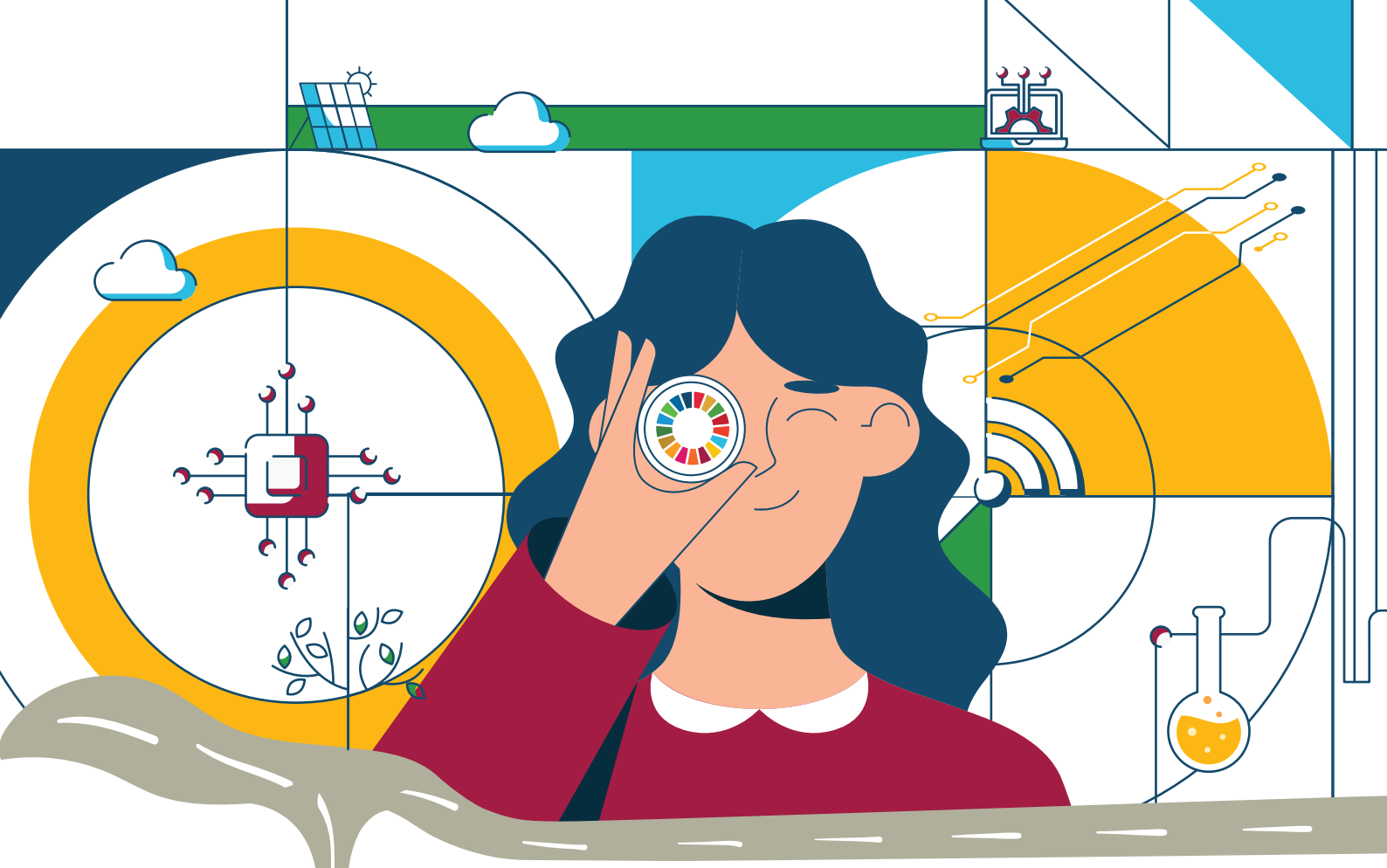

ANNUAL SDG REVIEW 2024

Skills development, innovation and the private sector in the Arab region

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Economic and Social Commission for Western Asia

ANNUAL SDG REVIEW 2024

Skills development, innovation and the private sector in the Arab region

The Review is a preparatory document of the Arab Forum for Sustainable Development to encourage discussion on priority issues for the achievement of the Sustainable Development Goals in the Arab region.

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List of acronyms

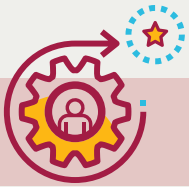
CEO	chief executive officer
COVID-19	coronavirus disease 2019
ESG	environmental, social and governance
GCC	Gulf Cooperation Council
GDP	gross domestic product
GERD	gross expenditure on research and development
GII	Global Innovation Index
HIC	high-income country
ICT	information and communications technology
KPI	key performance indicator
LDC	least developed country
LIC	low-income country
MIC	middle-income country
MSMEs	micro-, small and medium-sized enterprises
NGO	non-governmental organization
R&D	research and development
SDG	Sustainable Development Goal
SMEs	small and medium-sized enterprises
STEM	science, technology, engineering and mathematics
TVET	technical and vocational education and training

Key messages

Skills development and the private sector in the Arab region

Skill accumulation in many Arab countries continues to lag behind global trends. Moreover, growing evidence reveals a significant skills mismatch, as acquired skills often do not meet the evolving demands of the labour market.

- **Less than 60 per cent of youth complete secondary education**. Moreover, less than a third attain at least a minimum proficiency level in mathematics and less than two thirds in reading.
- **Only 5 per cent of youth enrol in technical and vocational education and training (TVET)**, which is often disconnected from labour market demands.
- **Only a third of youth enrol in university**. However, a notable 28 per cent of graduates emerge from the globally coveted fields of science, technology, engineering and mathematics (STEM).
- **The majority of adults in the Arab region lack information and communications technology (ICT) skills**, including those generally perceived as less complex, such as copying or moving a file or sending emails with attached files.
- **Only a fifth of the skills demanded in the online job market are relevant to the fourth industrial revolution.**
- **Twenty-two per cent of employers cite inadequately skilled workers as a major hindrance to business**. The challenge, however, is more acute in conflict-affected nations, least developed countries and the Maghreb.



Few Arab enterprises provide formal training to their employees, but those that do innovate more.

- **Only 19 per cent of enterprises in the region offer formal training to their permanent staff**, lagging behind the global average of 32 per cent and ranking second to last among world regions.

- **Small firms are less likely to invest in formal training**. Firms with 5–19 employees in Egypt, Jordan and Lebanon are roughly four times less likely to offer training than those with at least 100 employees.

- **Companies with a higher proportion of university-educated employees are more likely to provide training**. Moreover, firms fostering training are more likely to introduce innovative products or processes.

Apprenticeships or internships with private employers have a limited reach in the Arab region.

- In Egypt, Jordan, Lebanon, the State of Palestine and Tunisia, on average **only 11 per cent of individuals aged 15 to 35 have participated in an apprenticeship or internship with an employer**, which is below the average of 19 per cent for 33 low- and middle-income countries globally.

- Less than 2 per cent of individuals that complete the school-to-work transition in the region do so after participating in an apprenticeship or internship.

- Enterprises that offer skills development opportunities to students often do it in partnership with universities, Governments or non-governmental organizations.

Technology-oriented enterprises increasingly offer training in partnership with Governments.

- Such trainings may target public sector employees or wider audiences.

- While local companies may participate in such initiatives, they are usually led by global giants.

Innovation and the private sector in the Arab region

Innovation performance has seen fluctuating progress, and in many Arab countries, innovation inputs are inefficiently converted into outputs.

- In 2023, **three Arab countries** were **within the top 50 ranks** on the **Global Innovation Index**.
- Albeit witnessing slight improvements over the five-year period 2018–2022, the share of **patents from the Arab region** in the world total remains **very low**, at **only 0.5 per cent**.
- **Women are less likely to hold patents than men**, globally and regionally.
- **Companies reporting on sustainability are integrating innovation in their vision, mission statement and/or commitments**, with a focus on nurturing innovators, investing in innovation, securing partnerships for innovation and using technology.

While the region is witnessing a shift towards an ecosystem-driven approach to stimulate innovation, financing remains a challenge and sustainability has yet to take hold.

- In 2021, **0.61 per cent of gross domestic product was spent on research and development (R&D) in the Arab region**, which was low compared to the global average of 1.9 per cent. Data on how much the private sector spends on R&D are limited or unavailable in most Arab countries.
- Venture capital in the region saw a notable growth in 2021 and 2022, the two years following the start of the coronavirus disease 2019 (COVID-19) pandemic, but then declined in 2023, which is similar to a global downward trend. In 2021, **total venture capital in the region exceeded the $3 billion mark**, more than double the amount in 2020 and higher than in any previous year.
- **Venture capital investors are focused on innovation and the development of profit-generating businesses**, but not specifically on sustainable development.
- Financing has been reported as a top barrier to innovation in private companies. **More than half of the enterprises in the region struggle with lack of funds as a major challenge** whether from within the company or from external sources.

The way forward

Improving primary, secondary and tertiary education quality and access remains a precondition for enhancing the Arab region's standing on innovation and skills development, and its ability to spur economic growth, tackle sustainability challenges, and integrate into global markets and processes. This requires enhanced cooperation with the private sector to better anticipate the skills needed by employers, strengthen TVET learning pathways and reinforce the emphasis on STEM fields.

Governments should also promote an enabling business environment and encourage job creation through the implementation of streamlined regulations, strategic investments in infrastructure, robust support for innovation and entrepreneurship, and a strong focus on small and medium-sized enterprises (SMEs).

Through targeted interventions and strategic partnerships, Governments, businesses and other stakeholders can significantly enhance the private sector's role in building a skilled and innovative workforce in the Arab region. Below are key action points to consider:

Governments

- Encourage job creation through the implementation of streamlined regulations, strategic investments in infrastructure, robust support for innovation and entrepreneurship, and a strong focus on SMEs.
- Target investment in skills through collaborative public-private financing initiatives, particularly for low-skilled workers and SMEs.
- Promote an enabling environment for innovation through a legal and regulatory framework that simplifies business procedures, facilitates access to credit and financial services (especially for SMEs and start-ups), integrates sustainable development, provides incentives, improves market access, and focuses on women and youth. The framework should build on an assessment of business needs and challenges while considering how these may change depending on the sector and stage of business development.

Private sector

- Collaborate with the Government as well as education and training providers by offering stronger input to bridge the skills mismatch.
- Increase investment in employee training and expanding the provision of quality apprenticeships and other forms of work-based learning for young women and men.
- Strengthen the commitment to harnessing innovation in diverse forms to accelerate the achievement of the Sustainable Development Goals (SDGs). In addition, engage with authorities in finding solutions to legal limitations hindering the development of innovative solutions, whether products or services. Showing evidence of the solution's social, economic and/or environmental benefits could help foster positive change.
- Support innovation ecosystem players through partnerships, joint ventures and investments. Some companies may choose to organize competitions and hackathons to identify innovative products that are aligned with the SDGs.

Academic institutions

- Instil a culture of innovation and entrepreneurship in STEM fields. This could be achieved by integrating innovation into academic curricula, hosting hackathons and awards to generate practical applications, and leveraging private sector resources and expertise.

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Introduction

To become better aligned with the Sustainable Development Goals, **the private sector in the Arab region needs to mobilize and build on its assets, the most valuable of which is human capital: skills, capabilities and innovation.**

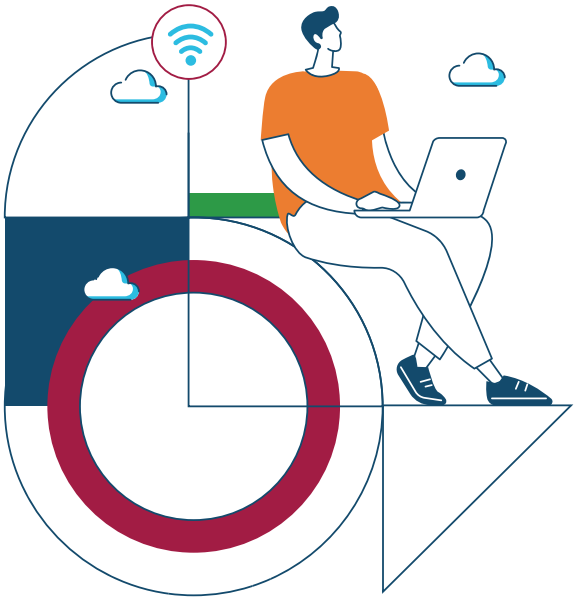
The 2030 Agenda for Sustainable Development (2030 Agenda) recognizes the importance of innovation and skills development by setting them at the level of the Sustainable Development Goals (SDGs) and integrating them within targets, indicators and means of implementation. The 2030 Agenda also acknowledges the role of the private sector,[1] ranging from micro-enterprises to cooperatives to multinationals, in the implementation of the SDGs. It has particularly called upon businesses to apply their innovation in solving sustainable development problems and committed member States to take the necessary actions to promote effective partnerships.

Building on evidence of a business case for the SDGs, the United Nations Economic and Social Commission for Western Asia (ESCWA) has been pushing for a more SDG-aligned private sector in the Arab region to help respond to increasing economic, social and environmental pressures. To become better aligned, the private sector needs to mobilize and build on its assets, the most valuable of which is human capital: skills, capabilities and innovation. **Multiple crises, the fast pace of technological advancement and other global trends necessitate equipping the current, and future, workforce with matching skills – the skills of the future**.

The ESCWA Annual SDG Review 2024, the third in the series, explores innovation and skills development in the private sector. It builds on the Annual SDG Review 2023, which provided insights on the contribution of the private sector to the realization of the 2030 Agenda and the SDGs in the Arab region. The 2024 Review:

- Compiles available information and data to offer insights into regional trends and gaps, supported by examples and case studies from selected Arab countries.
- Builds on a reading of selected company sustainability reports to highlight trends and good practices.
- Analyses the results of the ESCWA Survey on Innovation and Skills Development by Private Enterprises in the Arab Region (box 1).

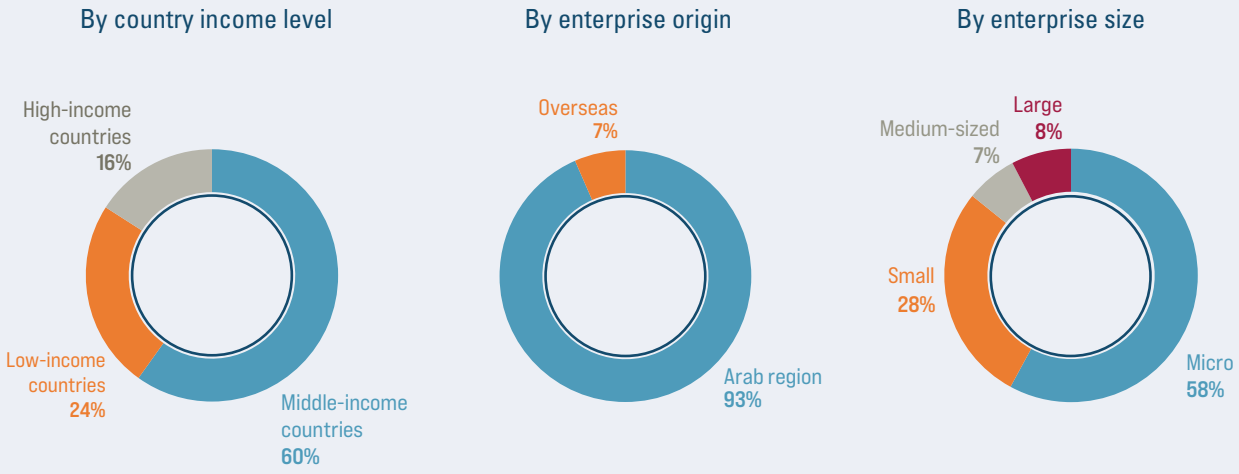
The Review includes two main chapters: chapter 1 covers skills development, while chapter 2 addresses innovation; both have a focus on the private sector. Each chapter provides a snapshot of the respective landscape in the Arab region, assesses what the private sector is doing and the challenges it faces, and provides guidance on actions needed to address current gaps. Special attention is given to micro-, small and medium-sized enterprises (MSMEs), as they account for the vast majority of firms in the region, play a crucial role in innovation, job creation, economic diversification and local development, and their potential to actively contribute to the achievement of the SDGs.



Box 1.
Survey on innovation and skills development by private enterprises in the Arab region

In October 2023, ESCWA conducted an online survey on innovation and skills development by private enterprises in the Arab region, emphasizing the alignment of firm practices with the 2030 Agenda and the SDGs. The survey received 183 valid responses, with the majority coming from firms located in middle-income countries (MICs) (64 per cent), followed by companies based in low-income countries (LICs) (21 per cent) and high-income countries (HICs) (16 per cent), as illustrated below. At least one response was received from each of the 21 member States of ESCWA. The vast majority of respondents were companies headquartered in the Arab region, with local affiliates of foreign companies accounting for 7 per cent of responses. MSMEs accounted for over 90 per cent of responses, in line with their large share in the region's total number of enterprises. Nine key survey findings are discussed in the next two chapters.

Survey respondents by country income level, enterprise origin and enterprise size
(Percentage of respondents)



Source: ESCWA Survey on Innovation and Skills Development in Private Enterprises in the Arab Region, 2023.

Notes: The World Bank's 2023 country classification by income level categorizes Arab States as follows: Somalia, the Sudan, the Syrian Arab Republic and Yemen are LICs; Algeria, the Comoros, Djibouti, Egypt, Iraq, Jordan, Lebanon, Libya, Mauritania, Morocco, the State of Palestine and Tunisia are MICs; and Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates are HICs.

Enterprises are classified by the number of employees: micro-enterprises (less than 10), small enterprises (10–50), medium-sized enterprises (51–250) and large enterprises (more than 250).

1

Skills development and the private sector

1. Skills development and the private sector

A skilled labour force underpins the competitiveness and sustained growth of firms, driving their ability to embrace new technologies and foster innovation. Investing in skills development not only enhances the adaptability of companies but also contributes to achieving the SDGs, most directly to the promotion of lifelong learning opportunities (SDG 4), decent work and economic growth (SDG 8), and industrialization, innovation and infrastructure (SDG 9). Moreover, equitable, inclusive and gender-responsive skills development can reduce inequalities, empower women, promote social justice and accelerate the achievement of all 17 SDGs.

Collaboration between the private sector, Governments, and education and training providers is instrumental in tailoring policies and programmes to align with the skills demanded by the labour market, with a forward-looking perspective into the jobs of the future.

The private sector plays a pivotal role in the journey of skills development, as it is uniquely positioned to identify the skill sets needed within their industries and contribute to the design and implementation of training programmes. Governments and private sector entities in the Arab region are increasingly recognizing the strategic importance of skills development in driving economic progress. Initiatives that promote lifelong learning, training, and collaboration between industries and educational institutions are gaining traction. However, investment in skills development by firms remains inadequate. The incidence of formal training for employees is generally low, particularly among smaller enterprises, and few companies actively engage in vocational training or other types of work-based learning initiatives for students. By aligning skills development efforts with the specific needs of the labour market, firms and States have the potential to increase innovation, drive productivity gains and raise competitiveness. Skills development can also compensate for insufficient schooling, generate higher wages for workers and contribute to improved living standards.

This chapter examines the skills landscape in the Arab States, assesses the involvement of the private sector in upskilling and reskilling the workforce, and outlines actionable points for private enterprises, Governments, education and training providers, and other stakeholders to collaboratively enhance skills development in the region.

A. Snapshot of the skills landscape

The Arab region's young and increasingly well-educated population represents a formidable force capable of reshaping its development trajectory. However, the expansion in the region's talent pool has not translated into substantial strides in the labour market, as many countries continue to grapple with high unemployment, particularly among women and the youth. Skill accumulation in many Arab States remains a significant challenge, lagging considerably behind global trends. Moreover, growing evidence reveals a significant skills mismatch, as acquired skills often do not meet the evolving demands of the labour market, with young people failing to find jobs while employers struggle to fill job vacancies.[2]

A large share of the youth in the Arab region are not adequately educated for the professional roles they perform.[3] This is primarily driven by "undereducation", where youth lack the essential qualifications for their jobs, but also increasingly by "overeducation",

The expansion in the region's talent pool has not translated into substantial strides in the labour market, as many countries continue to grapple with high unemployment, particularly among women and the youth.

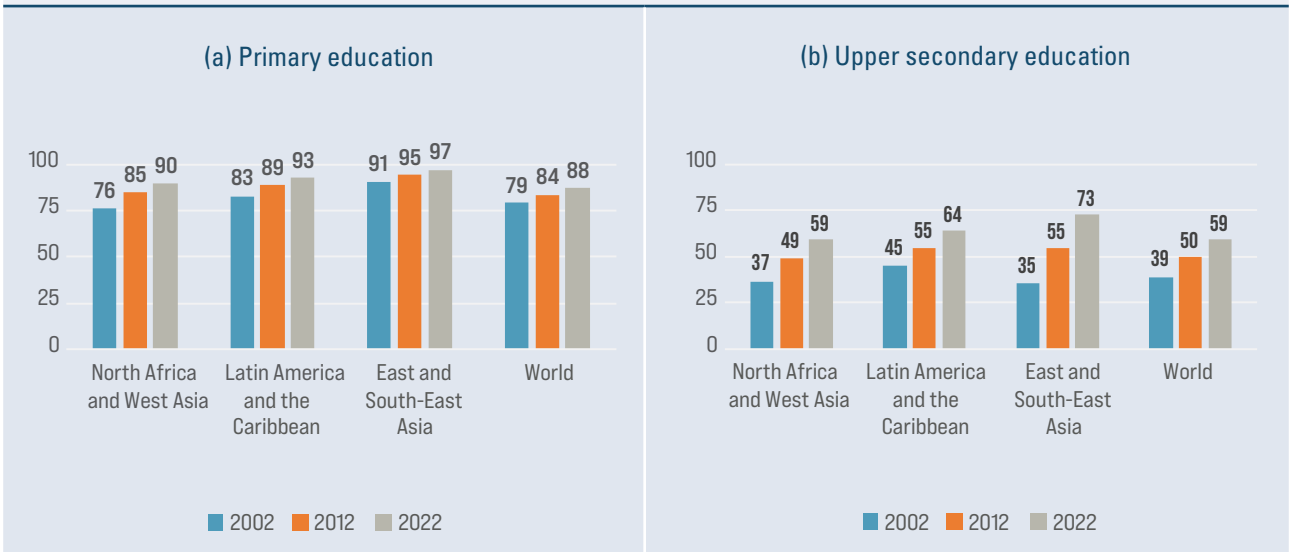
with young individuals working in positions for which they are overqualified.[4] **Undereducation is associated with limited skill accumulation, while overeducation is often linked with skills misalignment, as individuals acquire skills that are not highly sought after in the labour market**. Even individuals with the appropriate qualifications for a given role may encounter skills gaps. For instance, computer science graduates may accumulate skills in one programming language, while the market demands expertise in another programming language.

Limited skill accumulation and insufficient skill alignment within the workforce present challenges to the operation of enterprises and pose constraints to growth and sustainable development in many Arab States. Unleashing the full potential of the youth and boosting the competitiveness of local enterprises hinges on building more extensive, diversified, and adaptable talent pools and skills ecosystems, which can enable a more agile response to rapidly changing labour market dynamics. A skilled labour force, as measured by workers' educational attainment, has been shown to unlock enhanced productivity, fuelling growth and development opportunities across the individual, firm and societal levels.[5] However, it is crucial to ensure that accumulated skills are aligned with market requirements. The private sector has an important role to play not only in cultivating human capital but also in creating high-quality, skilled employment opportunities for a broader segment of the Arab population.

1. Improved access to primary and secondary education, but with disparities in quality

Arab countries have made progress in expanding access to primary and secondary education in recent decades, as illustrated in figure 1. Notably, the completion rate for upper secondary education among young people in North Africa and West Asia[6] increased from 37 per cent in 2002 to 59 per cent in 2022, on par with the global average. While this represents an important step in instilling the skills of the future workforce, the region continues to lag behind the benchmarks set by East and South-East Asia (73 per cent) and Latin America and the Caribbean (64 per cent). Moreover, access to education remains severely constrained in the least developed countries (LDCs) in the Arab region, with less than a quarter of young people completing upper secondary education in the Comoros and Mauritania.[7]

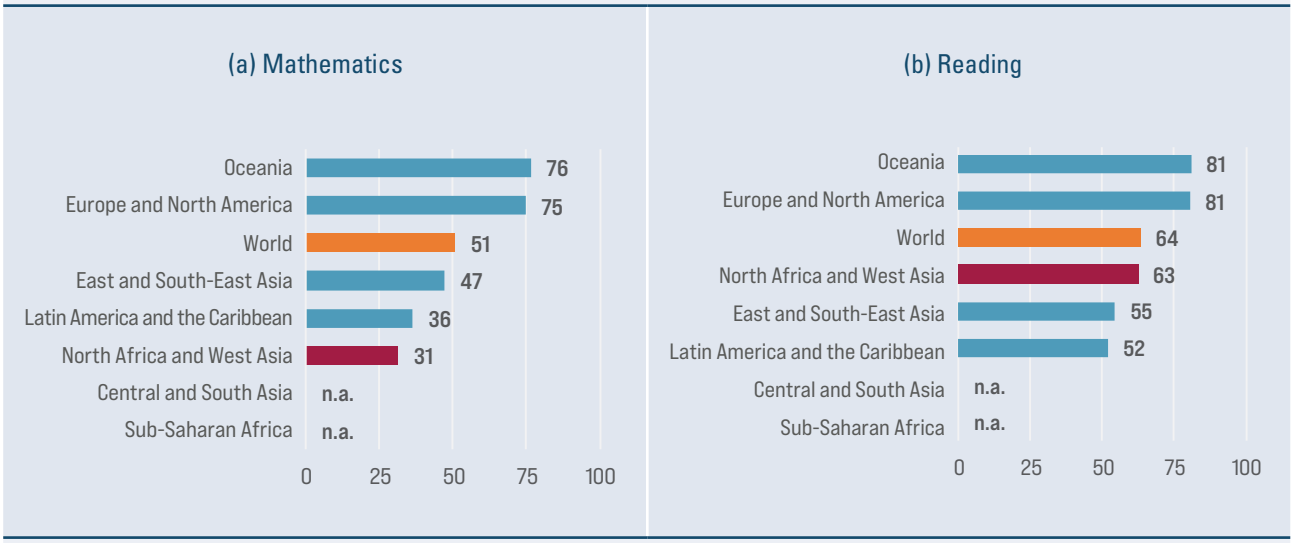
Figure 1. SDG indicator 4.1.2: Completion rates for primary and upper secondary education, 2002, 2012 and 2022 (Percentage)



Source: ESCWA, 2023b.

Note: Completion rates are computed as the percentage of a cohort of children or young people aged three to five years above the intended age for the last grade of each level of education, who have completed that grade.

Figure 2. SDG indicator 4.1.1c: Proportion of young people at the end of lower secondary education achieving at least a minimum proficiency level in mathematics and reading, 2019 (Percentage)



Source: ESCWA, 2023b.

Note: Regional averages are not reported for Central and South Asia and sub-Saharan Africa.

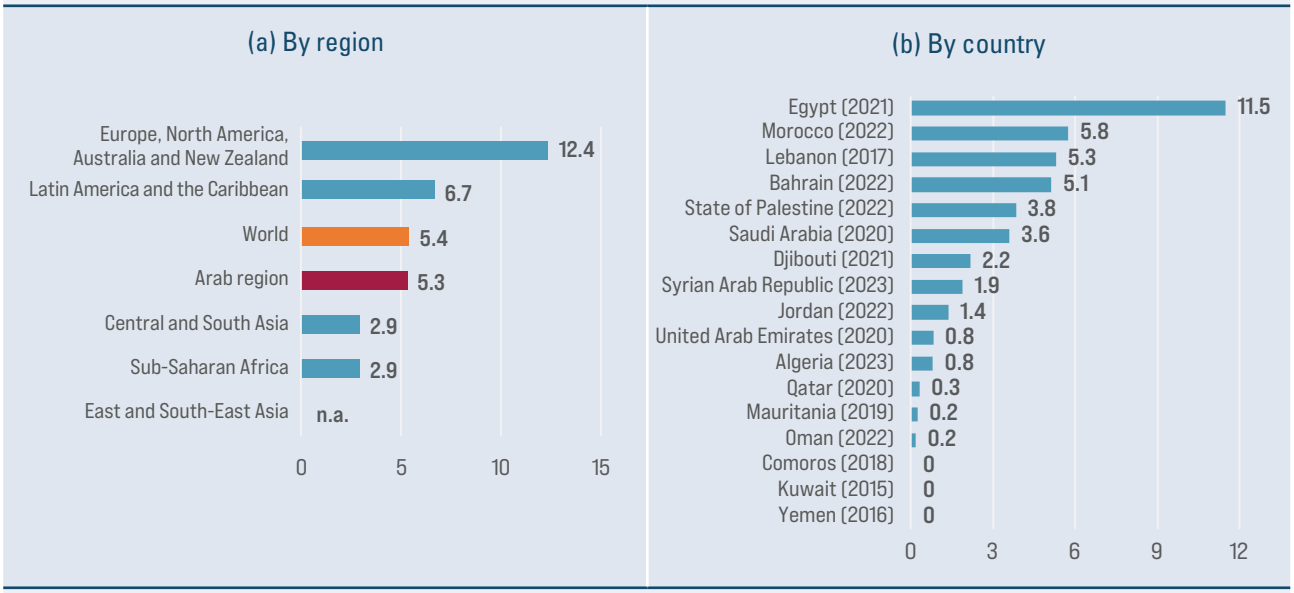
Despite improvements in access to education, many Arab States face challenges in improving learning outcomes, as the quality of instruction has often lagged behind gains in enrolment. The proportion of young people in North Africa and West Asia achieving at least a minimum proficiency level in mathematics and reading falls below the world average (figure 2). The region performs particularly poorly in mathematics, a discipline crucial for nurturing reasoning skills, which are highly valued in jobs associated with the fourth industrial revolution. In 2019, only 31 per cent of the youth in the region achieved proficiency in mathematics, substantially below the global average of 51 per cent and also trailing behind levels observed in other middle-income developing regions.

2. Technical and vocational education and training are limited and often disconnected from labour market demands

Technical and vocational education and training (TVET) enrolment is low across the majority of Arab countries; most Arab countries with available data fall below the global average, as depicted in figure 3. The main exception is Egypt, where 11.5 per cent of 15- to 24-year-olds were enrolled in TVET in 2021, followed by Morocco, with a 5.8 per cent enrolment rate in 2022. The situation drops to alarming lows in Algeria, the Comoros, Kuwait, Mauritania, Oman, Qatar, the United Arab Emirates and Yemen, where enrolment dips below 1 per cent. Compounding the issue is a persistent gender gap in TVET enrolment across 13 countries. Bahrain exemplifies this stark contrast, with a mere 1.4 per cent of young women aged 15–24 years enrolled in TVET compared to 8.5 per cent of young men in the same age bracket.

In many Arab countries, TVET systems have been found to suffer from low quality, disconnection from labour market demands and/or weak labour market outcomes.[8] However, in Morocco, formal public-private partnerships have strengthened the role of the private sector in shaping and providing TVET.[9] Industry associations operate independent training centres, supported by government-owned facilities, which are provided via concessions. The Government of Morocco also subsidizes the tuition for trainees in initial TVET. These training centres report placing 90 per cent of their annual graduates into jobs, compared to just over 50 per cent placement rates for regular public TVET institutes.[10] In recent years, other Arab countries have implemented reforms aimed at making TVET more demand-driven. For instance, in Egypt in 2018, the Ministry of Education and Technical

Figure 3. Proportion of people aged 15–24 years participating in technical or vocational programmes, by region and country, most recent year with available data (Percentage)



Sources: UNESCO (2019) for Lebanon; UNESCO (2021a) for Saudi Arabia; UNESCO (2023) for other countries. Arab region average calculated by ESCWA.

Notes: The Arab region average is a weighted average calculated using the population aged 15–24 years as weights.
Data years for each country are indicated in parentheses.
Data not available for East and South-East Asia, Iraq, Libya, Somalia, the Sudan and Tunisia.

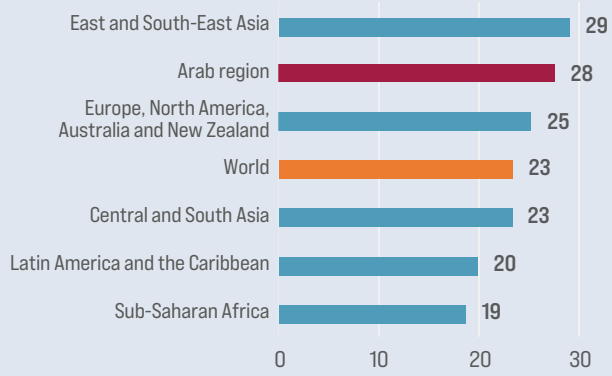
Education also entered into partnerships with the private sector to address challenges in skills development and TVET. It signed a cooperation protocol with private firms to implement the Egypt Makers initiative, under the slogan "Learn, Improve, Work". The objective is to establish applied technology schools, raise students' production skills in general, and to advance TVET.[11]

3. A significant share of university students graduate from science, technology, engineering and mathematics programmes, but overall university enrolment remains low

Amid the escalating adoption of new technologies and the expanding reach of digital access, graduates from science, technology, engineering and mathematics (STEM) programmes are increasingly in high demand globally. Notably, university students in the Arab region stand out as particularly inclined to graduate from STEM programmes, as depicted in figure 4. The region ranks second globally, with 28 per cent of graduates hailing from these fields, surpassing the world average of 23 per cent and developed regions, like Europe, North America and Oceania. Within the Arab region, Oman and Tunisia lead this trend, with nearly 40 per cent of graduates originating from STEM fields. Having a significant share of graduates coming from STEM fields is important for skills development, given that these disciplines act as the driving force behind technological innovation, equipping graduates with skills that are highly coveted by industries, such as problem-solving, analytical thinking and logical reasoning.

While Arab countries boast a high proportion of STEM graduates, the region lags behind in terms of gross enrolment in tertiary education (figure 5). Currently, 34 per cent of young people in the region enrol in university, compared to the global average of 42 per cent. Within the region, enrolment varies widely, ranging from 77 per cent in Bahrain to 6 per cent in Mauritania. Notably, MICs and HICs in the Arab region align with the global trend of higher university enrolment among women than men, showcasing progress towards gender equality in higher education. However, in most Arab LDCs, women remain underrepresented among university graduates.

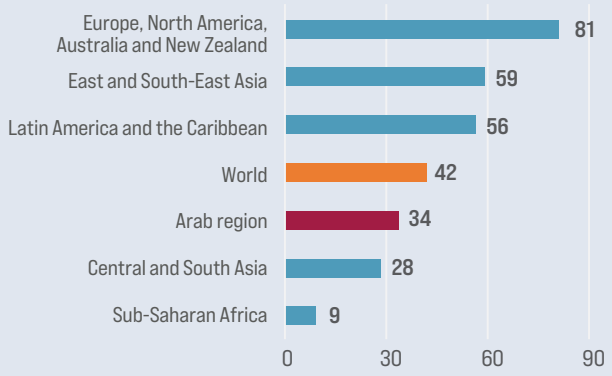
Figure 4. Proportion of graduates from STEM programmes in tertiary education, by region, 2022 (Percentage of total graduates in tertiary education)



Source: UNESCO, 2023.

Notes: Averaging was conducted using simple averages of country-level data.
Data not available for the Comoros, Djibouti, Kuwait, Lebanon, Libya, Somalia, the Sudan and Yemen.

Figure 5. Gross enrolment ratio for tertiary education, by region, 2022 or most recent year with data (Percentage of the population of the age group that officially corresponds to the tertiary education level)



Sources: World Bank (2023a) for Arab region; UNESCO (2023) for other regions and world.

Notes: Averaging was conducted using weighted averages, with the population of the age group officially corresponding to tertiary education employed as weights.
Average for sub-Saharan Africa pertains to 2021.

Widening access to tertiary education, when aligned with market needs, holds immense potential. It can equip young people with industry-relevant skills and knowledge, diversify the skill set of the workforce, encourage research and development, nurture an entrepreneurial mindset, spark innovation and propel economic growth. However, achieving these results requires balancing the supply of skilled graduates with the demand side of the labour market. If high-skill jobs are scarce, highly trained individuals will be unemployed, settle for low-skill jobs or emigrate, jeopardizing investments in advanced skills. Governments can address this equation by promoting an enabling business environment and encouraging job creation. This can be achieved through the implementation of streamlined regulations, strategic investments in infrastructure, and the provision of robust support to innovation, entrepreneurship and MSMEs. Simultaneously, Governments and the private sector can work together to build bridges between education and industry, ensuring skills development is aligned with the evolving demands of the job market.

To address the disparity in university enrolment in the Arab region and to foster the accumulation of specialized skills in the workforce, several initiatives hold promise. Investing in early education can lay a strong foundation, ensuring all individuals reach their full potential from the start.[12] Diversifying academic offerings to accommodate a broad range of interests and skills can make university a magnet for every kind of mind. Embracing flexible and innovative learning formats, like online courses and part-time options, can widen the door for those facing financial and geographical constraints. Implementing targeted scholarship programmes and financial aid measures is crucial to empower disadvantaged populations. Equally important is ensuring equitable access for both women and men, especially in Arab LDCs and in fields where women are traditionally underrepresented. Furthermore, expanding university enrolment should be coupled with a renewed emphasis on STEM disciplines.

If high-skill jobs are scarce, highly trained individuals will be unemployed, settle for low-skill jobs or emigrate, jeopardizing investments in advanced skills.

4. Information and communications technology skills are scarce and unequally distributed

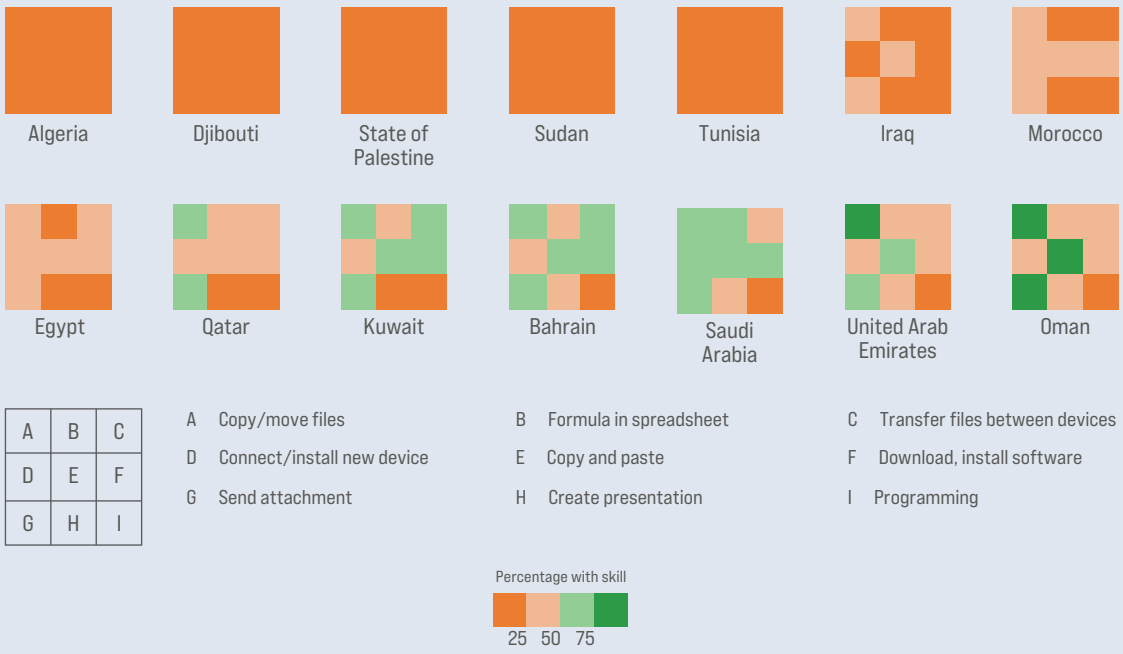
The majority of adults in the Arab region lack ICT skills, including those generally perceived as less complex, such as copying or moving a file or folder, using copy and paste tools to duplicate or move information within a document, or sending emails with attached files. Figure 6 depicts the percentage of adults possessing the nine ICT skills monitored under SDG indicator 4.4.1. The proportion of individuals reporting having a skill is indicated by one of four colours: dark green (more than 75 per cent), light green (50–75 per cent), light orange (25–50 per cent) or dark orange (less than 25 per cent).

In the eight Arab MICs or LICs with data, over half of adults lack proficiency in any of the nine monitored skills. The gap is even wider in five of these countries (Algeria, Djibouti, the State of Palestine, the Sudan and Tunisia), where over 75 per cent of adults lack these skills.

In all countries of the Gulf Cooperation Council (GCC), most adults report mastering at least two of the nine skills tracked by SDG indicator 4.4.1. Notably, in three of these countries (Bahrain, Kuwait and Saudi Arabia), a majority of adults are proficient in at least five areas. These nations are part of a small group of only 11 countries globally (out of the 91 countries with available data) where the majority of adults possess more than half of the nine skills monitored under SDG 4.4.1.

Analysing ICT skills among those between the ages of 20 and 24 based on educational attainment unveils a tale of two realities in Arab countries. In Tunisia, those with upper secondary or higher education exhibit proficiency in an average of five of nine key skills, mirroring technologically advanced nations. A stark contrast emerges in Iraq, where even those with the highest level of education struggle with basic digital tasks, averaging not even two skills out of nine.[13] Policies to address the scarcity of digital skills in the Arab region must not just advocate for universal secondary education but prioritize its quality, ensuring it equips young individuals with the digital skills they need to thrive in the twenty-first century.

Figure 6. SDG indicator 4.4.1: Proportion of adults possessing nine ICT skills, selected Arab States, 2015–2019



Source: Adapted from UNESCO (2021).

Note: Data not available for the Comoros, Jordan, Lebanon, Libya, Mauritania, Somalia, the Syrian Arab Republic and Yemen.

5. Demanded skills show limited alignment with the requirements of the fourth industrial revolution

According to the ESCWA Skills Monitor, a machine learning-powered platform that captures in-demand skills by scraping online job postings, the most sought-after soft skills by employers in the Arab region are communications, management and sales, while marketing, accounting and finance are the most coveted hard skills.[14] Notably, 9 of the 10 most demanded skills in the region are soft skills, and only a fifth of the skills sought by employers in the region are aligned with the requirements of the fourth industrial revolution.[15]

These insights are derived from the analysis of 3.2 million online job postings collected from nearly 90 job hubs between June 2020 and November 2023. Most postings originate from private enterprises, with some coming from State-owned enterprises.[16] The postings encompass positions in 16 Arab countries,[17] with a predominant representation of HICs, accounting for 73 per cent of the sample, followed by MICs, with 22 per cent of the postings, and the remaining 5 per cent not attributed to a specific country. Due to the limited number of observations available for LICs, and the potential skewing effect of posts associated with non-governmental organizations (NGOs) and international organizations, this country group has been excluded from the analysis.

Tables 1 and 2 provide an overview of the top 10 most demanded soft and hard skills in the online job market in the Arab region, with separate breakdowns for HICs and MICs. There is moderate to strong alignment in the most demanded skills between HICs and MICs. Notably, the top three most demanded soft skills – communications, sales and management – are consistent across the two country groups. Planning and English language also feature in the top five, although their order of priority differs from HICs to MICs. The remaining five skills in the top 10 are the same but not necessarily in identical rankings. HICs prioritize operations, customer service, problem-solving and Arabic language (in this order), whereas MICs place a higher emphasis on problem-solving and Arabic language, followed by operations and customer service. Leadership holds the tenth spot in both country groups.

Marketing, accounting and finance emerge as the top three hard skills most sought after by employers in both HICs and MICs. Other hard skills securing a spot in the top 10 across both country groups include key performance indicators (KPIs), invoicing, auditing and selling techniques. Despite these commonalities, demanded hard skills display a greater degree of differentiation between the two country groups compared to soft skills. For instance, while restaurant operation ranks as the fourth most demanded hard skill among HICs, it fails to make the top 10, or even top 20, in MICs. On the flip side, computer science claims the fourth position in MICs but only reaches tenth place in HICs. Similarly, JavaScript programming secures the eighth spot in MICs but does not feature in the top 10, or even top 20, in HICs.

The hard skills demanded by employers in MICs align more closely with the requirements of the fourth industrial revolution than those in HICs. The ESCWA Skills Monitor estimates that 30 per cent of skills demanded in the online job market in MICs are relevant to the fourth industrial revolution, while the corresponding figure is only 19 per cent among HICs.[18] This could be due to the higher activity of HICs in the online job market, where postings cover most occupations, diluting the share of ICT-related jobs in total job postings, while the lower activity of MICs may be biased towards ICT-related jobs, thus inflating the share for skills aligned with the fourth industrial revolution. Despite this difference, crucial skills remain underemphasized across the Arab region. Data analysis, a core competency for the fourth industrial revolution, fails to crack the top 10, ranking only twelfth in MICs and thirteenth in HICs. Furthermore, critically important ICT skills, like Internet of things, cybersecurity, cloud computing and artificial intelligence, are entirely absent from the top 20 in both country groups. This disconnect between current skill demands and future job requirements highlights the urgency for the Arab region to embrace technological advancements. While the current job market might not fully reflect the need for skills related to the fourth industrial revolution, proactively adopting these technologies is crucial for keeping pace with the global landscape and creating sustainable job opportunities in the long run.

Table 1. Top 10 demanded soft skills in the online job market in the Arab region, overall and by income group, June 2020–November 2023

Rank	Arab region	Arab HICs	Arab MICs
1	Communications	Communications	Communications
2	Sales	Sales	Sales
3	Management	Management	Management
4	English language	Planning	English language
5	Planning	English language	Planning
6	Operations	Operations	Problem-solving
7	Problem-solving	Customer service	Arabic language
8	Customer service	Problem-solving	Operations
9	Arabic language	Arabic language	Customer service
10	Leadership	Leadership	Leadership

Source: ESCWA, 2023c.

Table 2. Top 10 demanded hard skills in the online job market in the Arab region, overall and by income group, June 2020–November 2023

Rank	Arab region	Arab HICs	Arab MICs
1	Marketing	Marketing	Marketing
2	Accounting	Accounting	Accounting
3	Finance	Finance	Finance
4	Restaurant operation	Restaurant operation	**Computer science**
5	**Computer science**	KPIs	KPIs
6	KPIs	Business development	Invoicing
7	Invoicing	Auditing	Financial statements
8	Auditing	Selling techniques	**JavaScript programming**
9	Selling techniques	Invoicing	Auditing
10	Business development	**Computer science**	Selling techniques

Source: ESCWA, 2023c.

Note: Skills associated with the fourth industrial revolution are indicated in bold.

6. Migration affects skills availability unevenly

The permanent emigration of skilled labour can be associated with a loss of scarce human capital in origin countries.[19] In some cases, emigration signifies unrealized returns on the educational investments made by individuals, families and society at large. In particular, private enterprises miss the potential contributions these workers could have made towards productivity, knowledge sharing, innovation and growth in their home countries. In some Arab States, especially in the Maghreb and Mashreq subregions, the high proportion of highly educated and skilled individuals among emigrants raises concerns about brain and skill drain. For instance, a

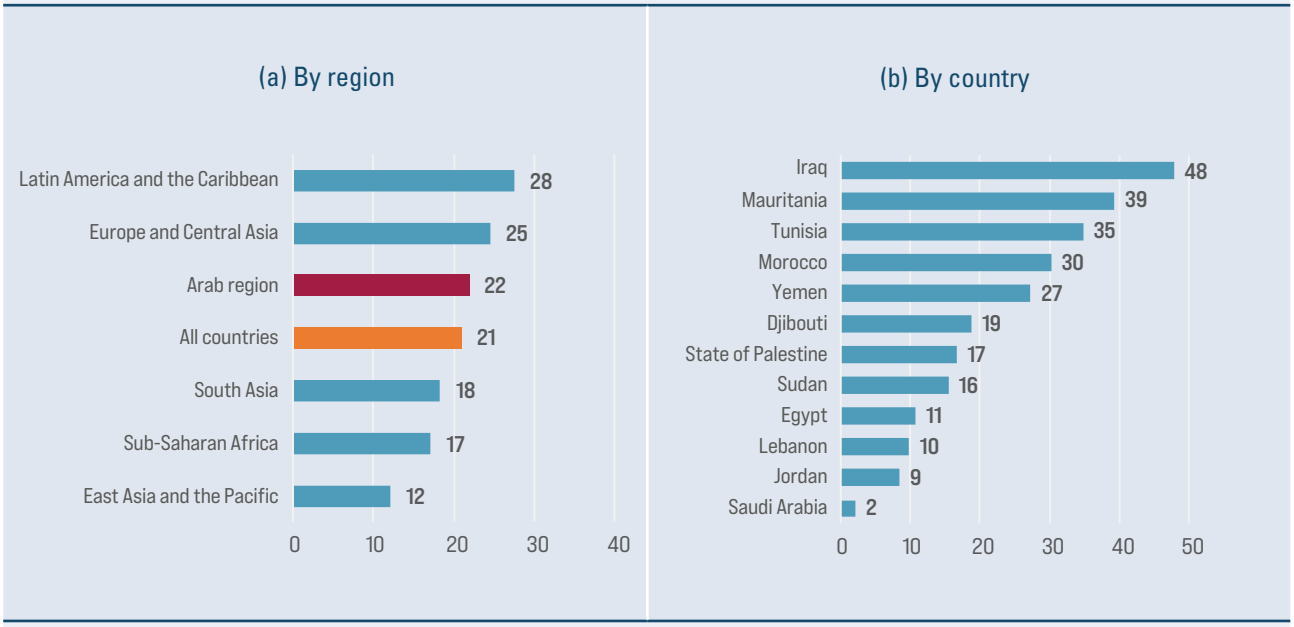
substantial 54 per cent of Egyptian permanent emigrants to developed countries in 2001–2007 held one or more university degrees, considerably higher than the average gross tertiary enrolment ratio of 28 per cent in the same period. In 2007, 23 per cent of Egyptian permanent migrants to developed countries were engineers.[20] While emigration can deprive origin countries of their most highly educated and skilled workers, effective governance can turn this trend into a potential asset. For instance, when properly managed, emigration has the capacity to support development trajectories through remittances and the transfer of skills.[21]

On the other hand, the GCC countries have relied heavily on immigrants to mitigate labour shortages across various skill levels, including individuals with STEM qualifications. The substantial influx of expatriate labour equipped with advanced technological skills has intensified competition in local labour markets, underscoring the need for enhanced alignment between local educational outcomes and labour market requirements.[22]

7. Employers in least developed countries, conflict-affected countries and the Maghreb identify inadequate skills as a key hindrance to business operations

While concerns about skill gaps are prominent in the specialized literature, only 22 per cent of employers in the Arab region identify inadequately skilled workers as a major constraint to their businesses, a figure close to the global average (figure 7). However, significant disparities exist at the country level, where three key trends are observed. Arab LDCs and conflict-affected countries grapple with a heavier burden, with Iraq and Mauritania leading the pack at 48 per cent and 39 per cent, respectively. Maghreb nations Tunisia (35 per cent) and Morocco (30 per cent) also face considerable hurdles, potentially linked to emigration to developed countries. Conversely, Saudi Arabia, the only Arab HIC in the sample, enjoys a comparatively low figure (2 per cent), as do non-conflict Mashreq countries Jordan (9 per cent), Lebanon (10 per cent) and Egypt (11 per cent).

Figure 7. Proportion of firms identifying an inadequately educated workforce as a major constraint, by region and country, most recent year with data, 2013–2023 (Percentage)



Source: World Bank, 2023b; Arab region average calculated by ESCWA.

Notes: Regional and "all countries" averages are simple averages of country-level point estimates.
Surveyed countries in the Arab region (with year of most recent survey): Djibouti (2013), Egypt (2020), Iraq (2022), Jordan (2019), Lebanon (2019), Mauritania (2014), Morocco (2019), Saudi Arabia (2022), the State of Palestine (2023), the Sudan (2014), Tunisia (2020) and Yemen (2013).

The loss of skilled labour is a significant challenge in countries affected by conflict, with a direct impact on the ability of firms to do business. This is a reflection of the tragic impacts of war, including the loss of life and displacement, and the difficulties linked to the rebuilding of human capital during and after conflict. For example, the lack of skilled workers is among the major challenges facing firms in the Syrian Arab Republic, according to the first comprehensive survey of private enterprises in the country's major urban areas since the conflict began in 2011.[23] When asked to rank the extent to which certain factors constituted a constraint to conducting business in 2017, 48 per cent of firms rated the loss of skilled workers as a major or severe problem, making it the third most reported factor, surpassed only by inadequate access to electricity and fuel.[24] Moreover, when asked about the single greatest category of obstacles to their business, service interruptions and loss of employees were reaffirmed as the two most reported categories, cited by 37 per cent and 16 per cent of firms, respectively.

B. Private sector contributions to skills development

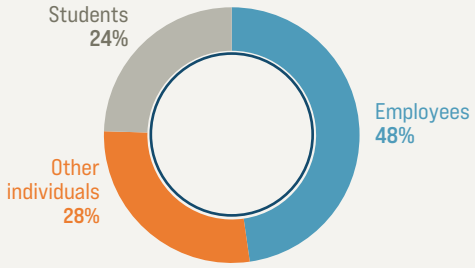
Private enterprises contribute to enhancing the skill sets of the workforce in the Arab region through diverse initiatives, including formal employee training, apprenticeships and internships aimed at students, tailored training offerings for individuals beyond their organizations, and strategic partnerships with educational institutions.

Although the potential for these private sector initiatives to bridge skills gaps is significant, their overall reach and intensity in the region have been limited. The impact has varied across countries and industries, underscoring the need for concerted efforts to amplify the role of the private sector in advancing skills development within the Arab workforce. Action points to unlock the full potential of private sector contributions to skills development in the region are presented in section C.

Survey finding 1

Own employees are the main target of skills development efforts by surveyed enterprises

Among enterprises that report being engaged in skills development in the Arab region, 48 per cent indicate that their employees are the main target of such efforts, followed by other individuals (non-students) seeking learning opportunities (28 per cent) and students (24 per cent).

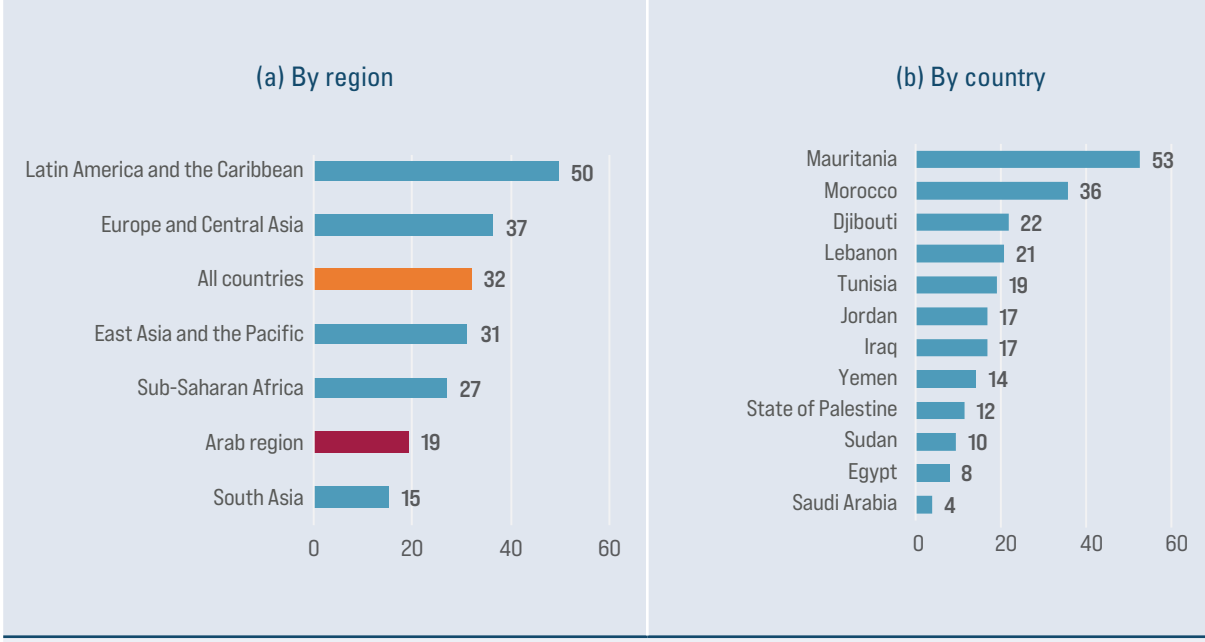


Source: ESCWA Survey on Innovation and Skills Development in Private Enterprises in the Arab Region, 2023.

1. Few Arab enterprises provide training to their employees, but those that do innovate more

Employee training remains alarmingly low in the Arab region. Enterprise surveys conducted by the World Bank across 12 Arab countries between 2013 and 2023 reveal that only 19 per cent of enterprises provide formal training[25] programmes for their permanent, full-time employees. This falls below the global average of 32 per cent, placing the region last globally, except for South Asia (figure 8 (a)). Noteworthy disparities exist within the region (figure 8 (b)), with Mauritania (53 per cent) and Morocco (36 per cent) exceeding the global average, while Saudi Arabia (4 per cent) and Egypt (8 per cent) lag significantly behind.[26]

Figure 8. Proportion of firms offering formal training to their permanent, full-time employees, by region and country, most recent year with data, 2013–2023 (Percentage)

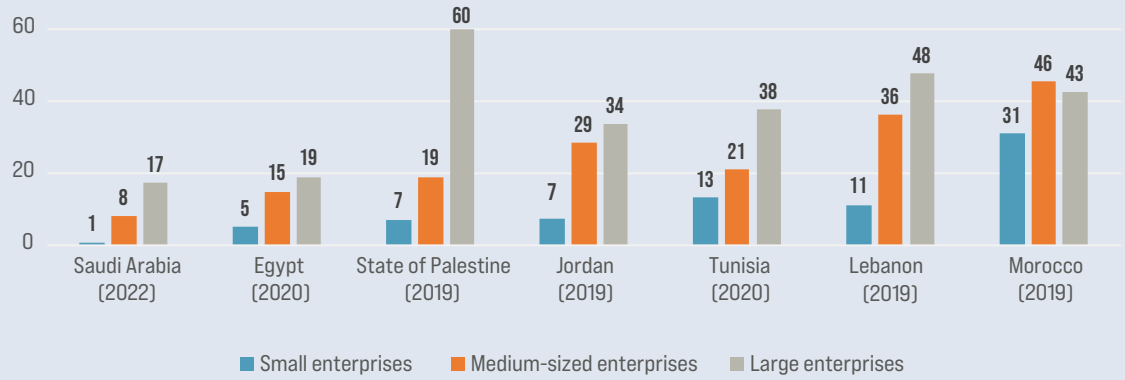


Source: World Bank, 2023b; Arab region average calculated by ESCWA.

Notes: Regional and "all countries" averages are simple averages of country-level point estimates.

Surveyed countries in the Arab region (with year of most recent survey): Djibouti (2013), Egypt (2020), Iraq (2022), Jordan (2019), Lebanon (2019), Mauritania (2014), Morocco (2019), Saudi Arabia (2022), the State of Palestine (2023), the Sudan (2014), Tunisia (2020) and Yemen (2013).

Figure 9. Proportion of firms offering formal training to their permanent, full-time employees, by country and enterprise size, selected countries and years (Percentage)



Sources: World Bank, 2019, 2020a, 2020b, 2020c, 2020d, 2020e, 2023c.

Notes: In the context of this figure, small enterprises are defined as having 5 to 19 employees, medium-sized enterprises as having 20 to 99 employees, and large enterprises as having 100 or more employees.

The years in parentheses indicate when country-specific surveys were conducted.

Data for Iraq have been omitted due to the limited number of observations for large enterprises.

Data for Djibouti, Mauritania, the Sudan and Yemen were not accessible.

The size of a company significantly influences employee training opportunities across the Arab region, as depicted in figure 9. Smaller firms, in particular, are less likely to invest in formal training compared to their larger counterparts in all countries with available data. For example, in Egypt, Jordan and Lebanon, companies with 5–19 employees are roughly four times less likely to offer formal training than those with 100 or more employees. This gap widens even further in the State of Palestine and Saudi Arabia. In six of the seven countries, relatively few small enterprises, ranging from 1 per cent in Saudi Arabia to 13 per cent in Tunisia, offer training to their employees.

However, Morocco stands out as a positive outlier, showcasing that deviating from this trend is feasible, with a notable 31 per cent of its small enterprises offering formal training.[27] The gap between small and large companies is also considerably narrower than in other Arab States. Remarkably, among documented Arab countries, Morocco is the only one where medium-sized companies lead in the provision of training. This relative success may be attributed to a multi-pronged policy approach, including mandatory training requirements in certain industries, financial incentives for companies investing in employee training (e.g. tax breaks and subsidies), public-private partnerships offering public co-funding schemes for firms' training expenses, and targeted support for skills development start-ups and SMEs. Enhancing training within SMEs holds the potential to unlock a wave of upskilling and reskilling, driving productivity, innovation and growth. Box 2 showcases examples of how SMEs are embracing formal training in Morocco and the Sudan.

Box 2.
Spotlight on SMEs: Addressing skills gaps through training

Eco-dôme Maroc, an earth-based construction company from Morocco, confronted a significant skills gap in finding workers proficient in earthen construction techniques. The SME invested almost a year in recruiting, training and forming their inaugural operational team, focusing on both theoretical and practical aspects. Subsequently, the enterprise devised a system to facilitate the transfer of experience and expertise from seasoned recruits to new team members. This dual-purpose initiative aimed to enrich the collective know-how of the workforce while ensuring seamless integration with the team. The positive outcomes of this effort laid the groundwork for establishing multiple operational teams across various regions in Morocco, bolstering the company's capacity to initiate and manage several projects concurrently.

Based on information provided by
Youness Ouazri, Founder and Chief Executive Officer (CEO)
Eco-dôme Maroc
Morocco

Craft Store, a digital platform based in the United Arab Emirates and with operations in the Sudan, identified critical skills gaps related to marketing and digital literacy among vendors, which are primarily based in the Sudan. In response, the SME initiated targeted training programmes, delivering comprehensive modules on marketing strategies and digital skills. Recognizing the diverse backgrounds and abilities of participants, tailored approaches were implemented. This proactive strategy not only empowered vendors but also contributed to SDG 4 (quality education) and SDG 9 (industry, innovation and infrastructure). The tangible impact of these efforts is evident in the success stories of vendors, highlighted by a notable 95 per cent increase in sales. Ultimately, over 500 individuals have undergone training, supporting the creation of 70 jobs and showcasing a positive impact on livelihoods.

Based on information provided by
Azzam Elzain Abdelazim Ibrahim, Co-founder and CEO
Craft Store FZ LLC
United Arab Emirates/Sudan

Note: The companies highlighted in this box were selected randomly among the many companies that contribute to the SDGs in the Arab region. Mention of any firm, product or licensed process does not imply endorsement by ESCWA or the United Nations.

In the Arab region, companies with a higher percentage of university-educated employees or a larger proportion of young workers are more inclined to provide training opportunities.[28] Additionally, fast-growing and more productive firms exhibit a stronger commitment to employee training. While it is possible that more productive firms naturally gravitate towards training, there is also the potential for firms to become more productive as a result of training. A study in Morocco delved into decisions on employee training across 500 firms in 6 sectors (food, textiles, garments, leather, chemicals and plastics), revealing a subsequent impact on productivity. After adjusting for potential self-selection bias, the intensity of training was found to significantly and positively influence productivity in SMEs.[29] Interestingly, Arab companies fostering formal training or allowing employees time for skills development and ideation demonstrate a higher likelihood of introducing innovative products, processes, structures or methods.[30] For example, in Egypt, manufacturing firms providing formal training were found to be twice as likely to introduce a new product or adopt new technologies compared to their counterparts that do not offer formal training.[31]

Survey finding 2

Financial constraints hamper skills development efforts across the business landscape, especially for smaller enterprises

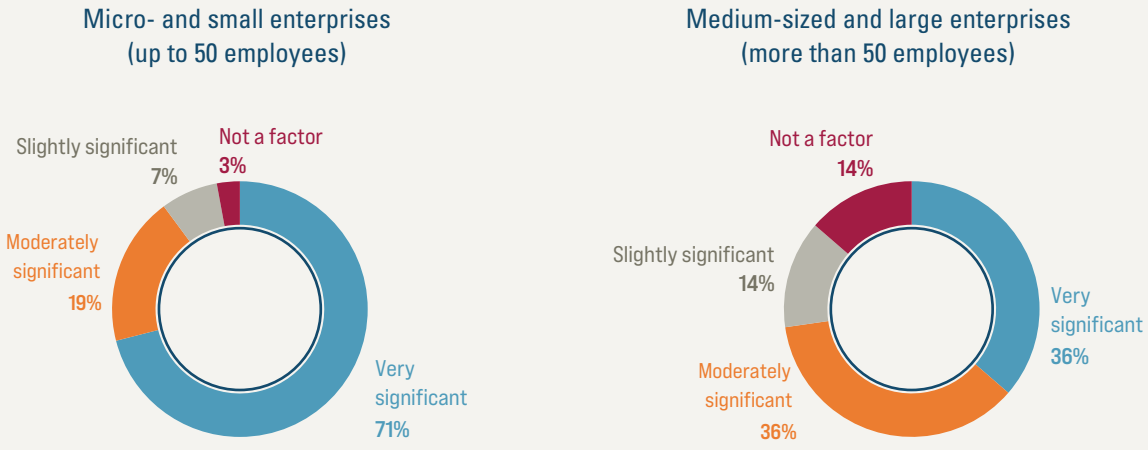
Two thirds of surveyed enterprises revealed that limited financial resources significantly hamper their ability to invest in employee skills, or even dissuade them from pursuing skills development altogether.

Micro- and small enterprises bear the brunt of this challenge. A staggering 71 per cent of them identify finance as a major barrier, with only 10 per cent feeling it is a minor issue or none at all.

Medium-sized and large enterprises also face financial hurdles, but to a lesser extent. Only 36 per cent consider resource scarcity as a very significant barrier to skills development, while 28 per cent view it as minimal or non-existent.

This stark contrast highlights the disproportionate impact on smaller businesses, often struggling with securing funding for critical investments like employee training.

Finance as a barrier to skills development



Source: ESCWA Survey on Innovation and Skills Development in Private Enterprises in the Arab Region, 2023.

Several key drivers influence the decision of Arab enterprises to invest in employee training. These include the recognized value of a skilled workforce in navigating technological advancements and maintaining competitiveness. However, resource limitations often impede these ambitions. This is particularly true among micro- and small enterprises, as the ESCWA Survey on Innovation and Skills Development in Private Enterprises in the Arab Region reveals.

Delivery of training programmes varies across enterprises, influenced by factors like company size, skill type, internal expertise and cost considerations. For example, language courses are commonly outsourced due to the ready availability of external providers. Moreover, the skills covered by employee training vary widely, often encompassing soft skills but also including hard skills, as illustrated in the results from the ESCWA Survey on Innovation and Skills Development in Private Enterprises in the Arab Region. In terms of approach, some companies opt for a top-down model, mandating training participation from staff. Others prefer a bottom-up approach, empowering employees to access training opportunities on their own accord.

Survey finding 3

Innovation and leadership are the most predominant areas for skills development among surveyed enterprises

Innovation is the most frequently mentioned thematic area, with nearly half of companies prioritizing it as the primary focus of skills development efforts. This emphasis could reflect a genuine awareness of its importance in today's rapidly evolving business landscape. However, the possibility of selection bias cannot be overlooked, as companies completing surveys on innovation may inherently be more inclined to prioritize it.

Despite this caveat, the remaining thematic areas highlight a diverse range of skills deemed valuable by surveyed enterprises. **Leadership** takes the second spot, following closely behind innovation, acknowledged by 43 per cent of firms.

Sales and marketing, digital expertise, data expertise and communication come next, each cited by over 20 per cent of respondents. Interestingly, leadership, sales, communication and customer service also feature among the top 10 most demanded soft skills identified by the ESCWA Skills Monitor.

In contrast, areas like compliance and ethics, diversity and inclusion, behavioural science and finance budgeting, while potentially crucial for long-term success, seem to remain underexplored by a significant portion of surveyed companies.

Percentage of firms listing a thematic area as a primary focus for skills development

Source: ESCWA's Survey on Innovation and Skills Development in the Private Sector in the Arab Region, 2023.

2. Limited participation in work-based learning opportunities for Arab students

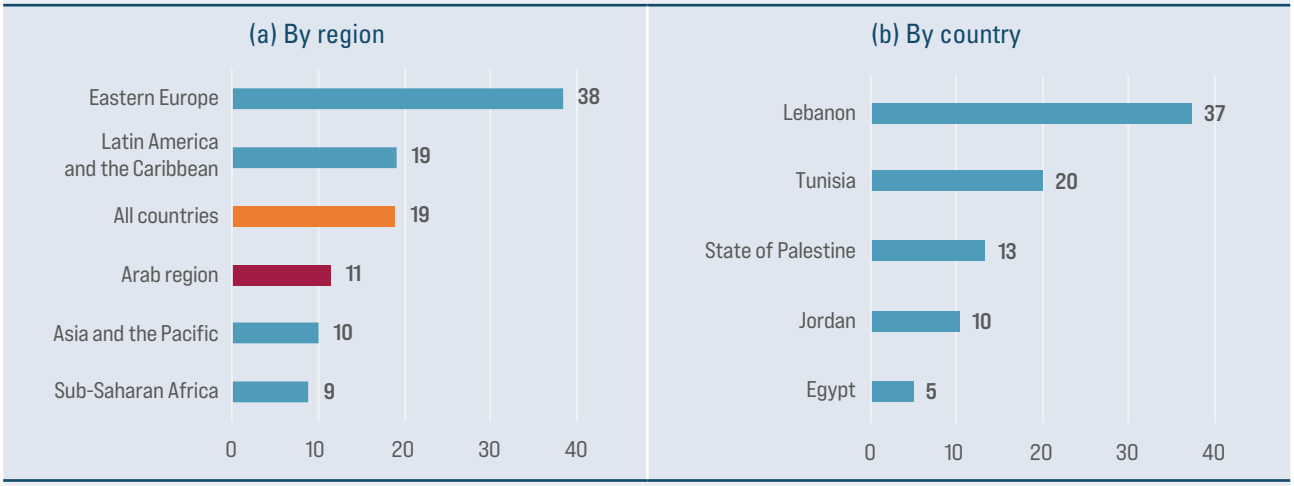
Apprenticeships and internships combine on-the-job and off-the-job learning, enabling students to develop skills and knowledge in preparation of entering the labour market. Private businesses can engage in apprenticeship and internship programmes in partnership with other institutions, as well as run their own work-based learning initiatives independently. While comprehensive data on the provision of apprenticeships and internships by Arab enterprises are not widely available, insights from work-to-school transition surveys and labour force surveys shed light on their relative scarcity across the region.

According to the School-to-Work Transition Surveys (SWTS) conducted by the International Labour Organization (ILO) between 2012 and 2015, a mere 11 per cent of individuals aged 15 to 35 years in five Arab MICs – Egypt, Jordan, Lebanon, the State of Palestine and Tunisia – reported participating in at least one apprenticeship or internship with an employer as part of their education (figure 10).[32] This figure falls below the average of 19 per cent for the 33 countries surveyed, and is less than a third of the rate seen in Eastern Europe (38 per cent). Participation rates also vary significantly across Arab countries. Lebanon boasts a rate of 37 per cent, on par with Eastern Europe, while Egypt languishes at just 5 per cent, one of the lowest globally.

The informality pervasive in labour markets and training systems in many Arab countries may be eroding the incentives typically linked with apprenticeships. For instance, in Egypt, traditional apprenticeship, largely informal in nature, is often associated with low-cost labour and is perceived as an unattractive opportunity. The transfer of knowledge is reported to be weak, and the learning process is predominantly non-experimental, contributing to the perpetuation of low-productivity technologies and a slow pace of innovation.[33]

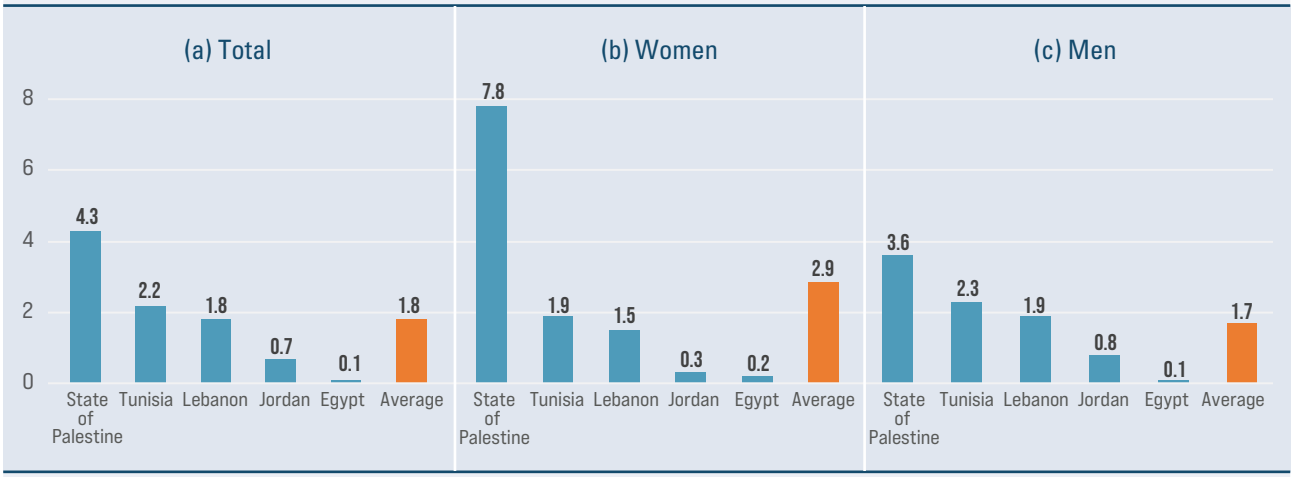
Only 1.8 per cent of young people in the five Arab countries surveyed by ILO secured their first stable or satisfactory job immediately after an apprenticeship or internship with an employer. This low rate masks significant disparities between countries, with rates ranging from a meagre 0.1 per cent in Egypt to as much as 4.3 per cent in the State of Palestine (figure 11). Gender-based discrepancies are also observed, with three countries (Jordan, Lebanon and Tunisia) showing lower averages for women, while two (the State of Palestine and Egypt) exhibit lower averages for men. Notably, nearly 8 per cent of young women in the State of Palestine complete the school-to-work transition to a first stable or satisfactory job after an internship or apprenticeship. This figure not only outshines those in other countries by a large margin but also more than doubles the rate for young men in their own country.

Figure 10. Proportion of people between 15 and 35 years old who had one or more internship(s) or apprenticeship(s) with an employer as part of their education, by region and country



Source: ILO, 2023a. Regional averages computed by ESCWA.
Note: Regional averages are simple averages of country-level point estimates.

Figure 11. Proportion of young people who had an apprenticeship or internship immediately prior to completing the school-to-work transition, by country and gender, 2012–2015 (Percentage of transited individuals)



Source: ILO, 2016f.

Note: Averages are computed as the simple average of country-level point estimates.

Box 3. Gender gap hinders work-based learning in the Arab region

Gender remains a factor of vulnerability among apprentices and interns in the Arab region. For example, in the Comoros, women represent only 19 per cent of paid apprentices and 40 per cent of unpaid apprentices. The gender disparity is reflected not only in the underrepresentation of women among apprentices but also in the fact that they are disproportionately relegated to unpaid positions, with the proportion of women among paid apprentices being only half that of unpaid apprentices.

In contrast, the gender gap is reversed in Lebanon, where 44 per cent of women and 33.5 per cent of men report having participated in apprenticeships or internships as part of their education. This is the most substantial positive difference between women and men among all countries surveyed globally by ILO, showcasing the potential for achieving greater gender parity in skills development in the region.

Sources: ILO, 2023b; Bonomelli Carrasco, 2021.

Among Arab enterprises engaged in skills development for tomorrow's workforce, many collaborate with educational institutions and other vital partners, including universities, technical and vocational schools, government agencies and NGOs. A particularly innovative example is Al-Quds University's Dual Studies programme, where Palestinian companies join forces to equip students with practical skills and industry exposure through a unique blend of theoretical and on-the-job training, boosting graduate employability and transforming companies' recruitment success (box 4).

A number of global technology giants have established partnerships with universities in the Arab region to provide training locally. For example, in Bahrain, Cisco (the United States of America) and Huawei (China) have established local academies in partnership with Bahrain Polytechnic and the University of Bahrain, respectively, offering programmes ranging from network administration and cybersecurity to cloud computing and mobile technologies. Similarly, in Morocco, Oracle (the United States of America) partnered with the Higher Institute of Management and Technology of Casablanca, while IBM (the United States of America) partnered with Hassan II University of Casablanca to also establish local academies to provide training on various subjects related to information technology (IT), including database administration, application development, cloud computing, artificial intelligence and blockchain technology.

Box 4.
Over 250 companies partner with Al-Quds University for work-integrated learning

To combat unemployment and equip graduates with in-demand skills, Al-Quds University launched the Arab region's first undergraduate Dual Studies programme in 2015. This innovative initiative, inspired by the German model, seamlessly blends theoretical learning with continuous on-the-job training at partnering companies.

The programme offers five bachelor degrees in high-demand fields: business administration, digital business, electrical engineering, industrial engineering and information technology. Students divide their time equally between on-campus learning and on-the-job training, ensuring a 50/50 balance between theoretical foundations and practical applications. This immersive approach guarantees that graduates enter the workforce with a solid understanding of their field and the practical experience to make an immediate impact.

Partner companies play a crucial role in the programme's success, actively shaping the curriculum to align with industry needs and providing students with valuable on-the-job training. They also offer monthly allowances to support students during their practical phases. Al-Quds University, in turn, facilitates the student-company partnership by pre-selecting students based on company requirements and managing all administrative procedures.

The programme's success is evident in its growing enrolment and impressive employment outcomes. As of 2023, 506 students were enrolled, 47 per cent being women. Among the 185 graduates to date, 129 have secured employment within 6 months of graduation – a remarkable achievement considering the disruptions caused by the COVID-19 pandemic during the first two graduate cohorts. This robust track record not only underscores the programme's effectiveness in bridging the gap between academia and industry but also its potential to contribute to increased employability. The Dual Studies programme provides an example of a collaborative approach that empowers graduates, strengthens companies and lays the foundation for a more skilled and vibrant future workforce.

Source: Al-Quds University, 2023.

Survey finding 4

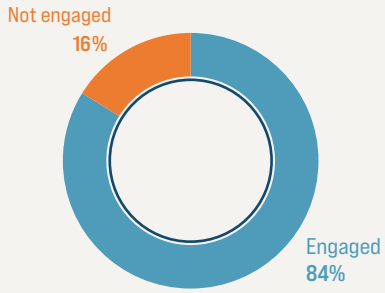
Most surveyed enterprises offer skills development opportunities to students, with both independent programmes and partnerships with diverse institutions fuelling their efforts

An overwhelming majority (84 per cent) of surveyed enterprises invest in the future workforce by actively participating in student skills development initiatives. Their efforts take varied forms, reflecting the diversity of corporate approaches to nurturing tomorrow's talent.

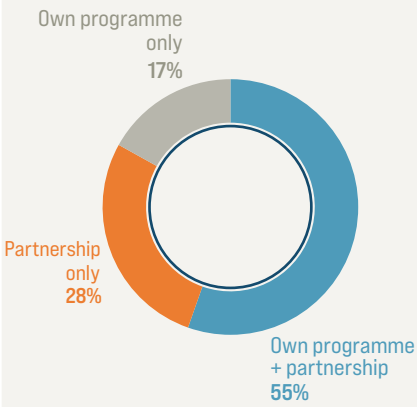
Within this group of engaged companies, 55 per cent follow a hybrid approach, blending the benefits of partnered programmes with diverse institutions and independent initiatives tailored to their specific needs. An additional 28 per cent opt exclusively for partnered programmes, while the remaining 17 per cent prioritize independent programmes.

Among collaborative enterprises, NGOs and universities emerge as the most prevalent partners, cited by 29 per cent and 24 per cent of the firms, respectively. International organizations and government agencies secure the third and fourth positions, respectively, acknowledged by 16 per cent and 15 per cent of the firms. Notably, only 13 per cent the enterprises report collaborating with technical and vocational schools.

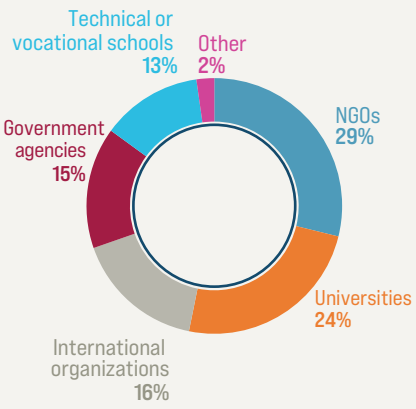
Engagement in skills development programmes aimed at students
(Percentage of surveyed firms)



Form of engagement
(Percentage of engaged firms)



Type of partner
(Percentage of engaged firms)



Source: ESCWA Survey on Innovation and Skills Development in Private Enterprises in the Arab Region, 2023.

3. Global enterprises increasingly offer training to general audiences or public sector employees, usually in technology sectors and in partnership with Governments

Global enterprises are increasingly collaborating with Governments in Arab States to enhance workforce skills, extending training initiatives beyond internal employees and students. This collaborative approach is evident in various countries.

Lebanon: Coursera Partnership (2020). Coursera (the United States of America) joined forces with the Ministry of Labour of Lebanon and ESCWA in 2020, providing free and certified learning opportunities to Lebanese citizens. Nearly 40,000 applicants registered, with approximately 25,000 completing more than 44,000 courses, accumulating nearly 550,000 learning hours. Notably, two thirds of applicants were between the ages of 19 and 29, with the post-university degree bracket comprising the largest number of applicants. Moreover, women outnumbered men across all age groups and course specialties, and 54 per cent of all applicants were unemployed.[34]

United Arab Emirates: National Programme for Coders (2021). The Government of the United Arab Emirates launched the National Programme for Coders in 2021, collaborating with tech giants like Cisco (the United States of America), Facebook (the United States of America), Google (the United States of America), Huawei (China) and Microsoft (the United States of America), as well as local enterprises such

as Emirates NBD, Majid Al Futtaim and Yalla. The programme aims to train 100,000 coders and establish 1,000 digital companies within five years, focusing on enhancing local talent through skills development initiatives led by international trainers.[35]

Saudi Arabia: IBM Collaboration (2022). IBM and the Ministry of Communications and Information Technology of Saudi Arabia signed a memorandum of cooperation in 2022, aiming to upskill 100,000 young women and men over five years in areas such as artificial intelligence, machine learning, design thinking, cybersecurity and software interoperability. The primary target is public sector employees. The public-private collaboration is expected to enable 100 workshops on design thinking at various government agencies and train 600 public sector employees in innovation accelerators.[36]

Saudi Arabia: Oracle Mostaqbli Initiative (2023). Oracle (the United States of America) launched the Mostaqbli (My Future) initiative in 2023 to empower the digital workforce of Saudi Arabia. The goal is to train and certify 50,000 Saudi nationals by 2027 in cloud-powered technologies, including artificial intelligence, machine learning and the Internet of things. The programme, in collaboration with Future Work and supervised by the Ministry of Human Resources and Social Development, is inclusive, targeting individuals at various learning and professional stages, with a special focus on youth and women.[37]

C. Action points

Set forth below are action points for Governments, businesses and other partners to unlock the full potential of private sector contributions to skills development in the Arab region.

1. Governments

- Improve the quantity and quality of primary and secondary education as the foundation for skills development while prioritizing equitable access and inclusion for girls, young women and persons with disabilities. Ensuring that every young person completes secondary education is crucial to tackling undereducation and its long-term implications for limited skill accumulation in the workforce.
- Enhance cooperation with the private sector to better anticipate the skills needed by employers and strengthen the relevance of TVET. Modernize the curricula, diversify programme offerings, strengthen quality assurance mechanisms, extend professional development options for instructional staff and develop national qualifications frameworks.
- Expand university enrolment and foster the accumulation of specialized skills by diversifying academic offerings, embracing flexible and innovative learning formats, implementing targeted scholarship programmes and financial aid measures to empower disadvantaged populations, and ensuring equitable access for both women and men, while renewing the emphasis on STEM disciplines.
- Encourage investment in skills through collaborative public-private financing initiatives, particularly targeted at supporting low-skilled workers and SMEs. Diverse funding options, such as training funds, tax incentives and loans to training institutions, have been employed to enhance private sector engagement, with varying levels of effectiveness.
- Promote an enabling business environment and encourage job creation through the implementation of streamlined regulations, strategic investments in infrastructure, robust support for innovation and entrepreneurship, and a strong focus on SMEs.

2. Private sector

- Collaborate with the government and education and training providers to address the mismatch between business needs and the skills of new labour market entrants, including by providing stronger input into curriculum development and engaging in TVET programmes. This could be done through industry associations, as in Morocco.
- Increase investment in employee training and expand the provision of quality apprenticeships, internships and other forms of work-based learning, with a focus on skills for the future, while ensuring equitable access and inclusion for women and persons with disabilities.

3. Education and training providers

- Deepen engagement with the private sector to ensure curricula are aligned with industry needs, with a forward-looking perspective into the jobs of the future. This could be done through the establishment of industry advisory boards for continuous feedback on programme design and delivery, the co-development of courses reflecting desired skills, and the facilitation of work-integrated learning at partner companies.

2

Innovation and the private sector

2. Innovation and the private sector

The 2030 Agenda recognizes the potential of innovation to accelerate human progress, drive economic growth and create employment. It integrates innovation within its goals, targets and means of implementation. It particularly calls upon businesses to apply their innovation in solving sustainable development problems. While SDG 9 is the goal that explicitly mentions innovation, the richness and versatility of innovation amplifies its importance for the achievement of all 17 SDGs.

While not strictly limited to technology, a connection is recurrently made between innovation and technology, particularly ICT. **The development of digital and emerging technologies is mostly led by private sector companies or happens through joint collaborations between the government and the private sector.**

More than one definition has been coined for innovation. According to the *Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation*, "Innovation is a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process). […] Innovation activities include all developmental, financial and commercial activities undertaken by a firm that are intended to result in an innovation for the firm."

Source: OECD/Eurostat, 2018.

As one of the mechanisms of the high-level political forum on sustainable development (HLPF), the multi-stakeholder forum on science, technology and innovation for the SDGs has hosted discussions on the role of the private sector in achieving the SDGs, with innovation as a key entry point. In its most recent edition,[38] the multi-stakeholder forum on science, technology and innovation for the SDGs (STI Forum) stressed the importance of private sector investments in innovation, technology development and research whereby private funding should not only focus on higher commercial potential but also on broader societal benefits. It also highlighted the potential of multi-stakeholder collaboration between the government, scientific institutions and the private sector to devise innovative solutions for local needs.

The private sector is thus the entry point to the analysis this chapter presents, in terms of its contribution to innovation and how it is impacted by the innovation ecosystem.

A. Snapshot of the innovation landscape

Research into measuring innovation has investigated the pillars and indicators needed for the development of a comprehensive measurement framework. The European Innovation Scoreboard, for example, includes pillars for education, infrastructure, and human and financial resources. It captures 32 indicators but covers only 38 countries (European Union and non-European Union States). The Organisation for Economic Co-operation and Development (OECD) Science, Technology and Innovation Scoreboard covered around 200 indicators before it was discontinued. While there have been attempts to develop an innovation measurement framework or scoreboard for the Arab region, they did not come to fruition.[39] The most widely used index is the Global Innovation Index (GII), which captures

While there have been attempts to develop an innovation measurement framework or scoreboard for innovation in the Arab region, they did not come to fruition.

107 indicators under 7 pillars and 21 sub-pillars. It distinguishes between innovation inputs and outputs and has covered 132 countries in its 2023 edition.

Over the last five years, the ranking of Arab countries covered in the GII has fluctuated. In the most recent edition, **GCC countries lead the region, with the United Arab Emirates, Saudi Arabia and Qatar ranking in the top 50 globally** (figure 12). Between 2022 and 2023, Oman saw the largest jump, climbing 10 positions, whereas Tunisia saw the largest drop of 6 positions. The index is based on two sub-indices that measure innovation: one for inputs and the other for outputs. Innovation inputs include the institutions, regulations, human capital, market sophistication and business capabilities. Outputs are mainly exports and trade as well as knowledge items such as patents, publishing, exports, and creative outputs including trademarks and mobile apps. The performance of most GCC countries on the GII is affected by a low innovation output sub-index, indicating that they do not efficiently convert innovation inputs into outputs. Morocco leads on innovation outputs, ranking fifty-fifth globally and reflecting efficiency in converting inputs to outputs. Innovation in Morocco is driven by the Government's commitment to building a national innovation system as well as strong regional and interregional partnerships, mostly with Europe. The innovation output strengths of Morocco are in industrial designs, high-tech manufacturing and ICT services exports.

Figure 12. Global Innovation Index of Arab countries

(a) Scores and global rankings, 2023

(b) Global ranking progress, 2019–2023

	2019	2020	2021	2022	2023
United Arab Emirates	36	34	33	31	32
Saudi Arabia	68	66	66	51	48
Qatar	65	70	68	52	50
Kuwait	60	78	72	62	64
Bahrain	78	79	78	72	67
Oman	80	84	76	79	69
Morocco	74	75	77	67	70
Jordan	86	81	81	78	71
Tunisia	70		71	73	79
Egypt	92	96	94	89	86
Lebanon	88	87	92		92
Algeria	113	121	120	115	119
Mauritania				129	127
Iraq				131	
Yemen	129	131	131	128	

Source: Compiled by ESCWA based on data from WIPO (2023a).

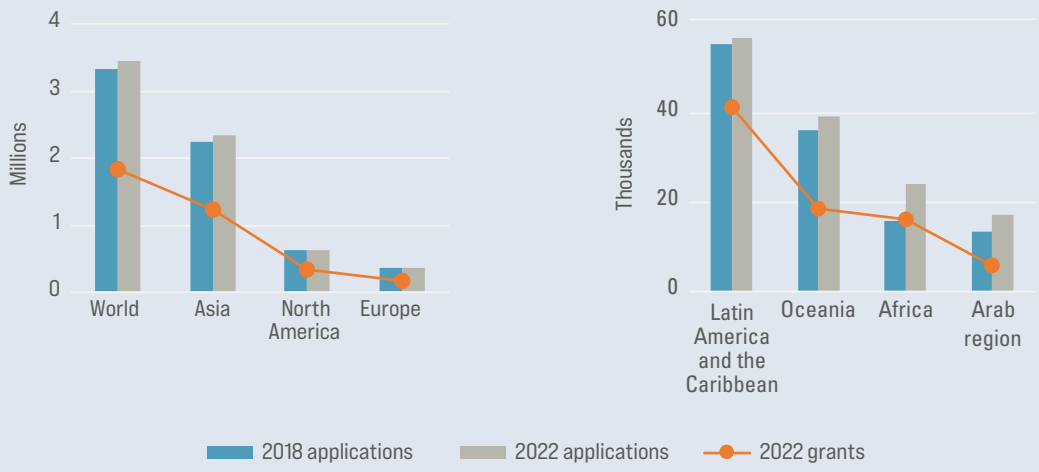
Notes: The GII report mentions that "Year-on-year comparisons of GII rankings need to take into account changes to the GII model that have occurred over time, as well as data availability".

The GII ranking ranges from 1 (most innovative) to 132 (least innovative), while the score is a normalized value between 0 (worst) and 100 (best).

1. The share of patents from the Arab region in the world total remains very low, albeit witnessing slight improvements in 2018–2022

Statistics on intellectual property registrations are a useful proxy of innovation outputs. The total number of patents in the Arab region stands at only 0.5 per cent of world patents, with a total of 17,260 applications for 2022 and only 5,786 patents granted (figure 13).[40] The top five Arab contributors are Saudi Arabia at 34 per cent of patent applications from the region, followed by Morocco and the United Arab Emirates (17 per cent), Egypt (11 per cent) and Algeria (6 per cent). Globally, the top patent

Figure 13. Patent applications and patent grants, 2018–2022



Source: Compiled by ESCWA based on data from WIPO, 2023.

holders are private companies such as IBM and Samsung (the Republic of Korea), each acquiring thousands of patents every year. In the Arab region however, patent applications are largely driven by public investments or State-owned enterprises; successful commercialization of those patents is also yet to be observed.[41]

2. Women are less likely to hold patents than men, globally and regionally

According to the World Intellectual Property Organization (WIPO), at current rates, global gender parity among inventors listed on the Patent Cooperation Treaty will not be achieved before 2064.[42] Little data is available to explain the low number of patent applications filed by women in the Arab region, especially that the percentage of female researchers in the Arab States was 41.1 per cent in 2021 – higher than the world average of 31.5 per cent. Possible reasons could be that there are fewer women than men in certain STEM fields. For fields in which patents are common and in which women work but do not participate in the patent system, the reasons could be social or linked to market and commercialization barriers. The gender gap in patenting implies that women are less likely to commercialize their inventions and engage in networks that can connect them to development or market partners. It also risks limiting the economic empowerment of women and the success of their businesses. This additionally means that partnership opportunities and access to finance are likewise impacted if a partner or financial institution favours entrepreneurs that have acquired a patent or applied for one.[43,44]

3. Regionally, gross expenditure on research and development as a percentage of gross domestic product is less than half the world average. The region needs not only to spend more on research and development but also to improve its absorptive capacity

Regionally, 0.61 per cent of gross domestic product (GDP) was spent on R&D in 2021, which is low compared to the global average of 1.9 per cent. The averages for Arab MICs and HICs are similar, with several MICs having higher values than some HICs. Despite the relatively low figures, HICs in the region are allocating large sums to scientific research, in excess of $5 billion in Saudi Arabia and $1 billion in Qatar, which may not be met with sufficient absorptive capacity. While Arab HICs have built advanced and sophisticated infrastructure and facilities for research, their gross expenditure on research and development (GERD) as a percentage of GDP remains low due to their high GDP value. This suggests that it is important to consider GERD as an absolute value,

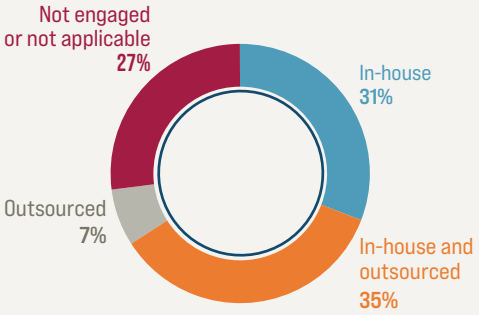
not only as a percentage of GDP, particularly in policymaking. In 2022, Saudi Arabia reported a 32.7 per cent increase in expenditure on R&D, reaching a value of $5.12 billion. The Government supplied 58 per cent of total funding and the private sector contributed 39 per cent.[45] Regionally, data on how much the private sector spends on R&D are limited or unavailable.

Survey finding 5

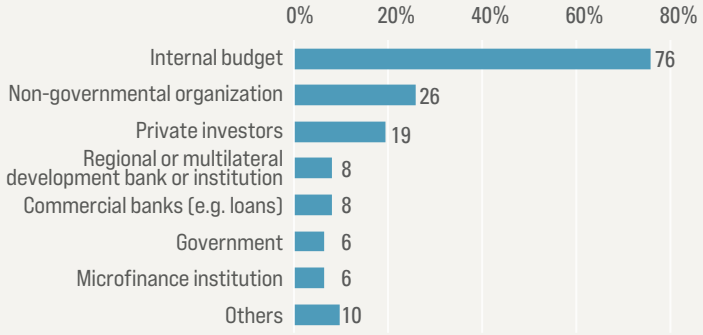
The majority of enterprises have reported they engage in research and development activities and mostly use internal budgets as sources of finance

The majority of enterprises have reported they engage in R&D: approximately 31 per cent do it in-house, 7 per cent outsource it, and 35 per cent resort to both in-house R&D and outsourcing to external entities. To finance these activities, 76 per cent use their internal budget, followed by 26 per cent from NGOs. Interestingly, only 6 per cent benefit from governmental funding for their R&D activities.

Engaging in R&D activities
(Percentage of surveyed firms)



Sources of financing
(Percentage of surveyed firms)



Source: ESCWA Survey on Innovation and Skills Development in Private Enterprises in the Arab Region, 2023.

B. The ecosystem for stimulating innovation in the private sector

Research into defining an innovation ecosystem has come up with different definitions and frameworks that combine mechanisms and actors. The United Nations Conference on Trade and Development (UNCTAD), the OECD and the Massachusetts Institute of Technology (MIT) have constructed models of innovation ecosystems that do have evident commonalities.[46] In 2017, ESCWA published a study that identified four ecosystem components that feed into a national innovation policy: improving education and training; strengthening the research and development base, improving the regulatory framework for business procedures, intellectual property and technology transfer; and supporting innovators.[47]

The interest of Governments in spurring start-up activity, particularly innovative ones, is reflected in the national institutional setup along with the legal and regulatory frameworks. Countries of the Arab region have taken an ecosystem-driven approach that caters to different requirements of establishing businesses[48] encompassing targeted programmes, initiatives, and laws for stimulating innovation and start-ups. Countries from the region[49] have passed laws or established institutional structures such as ministries or authorities to alleviate challenges facing enterprises, facilitate the formation of start-ups and facilitate access to financing, which is the challenge most reported by enterprises (box 5).

Box 5.
Spotlight on SMEs: Driving innovation amidst challenges

SMEs face numerous challenges, most of which relate to access to financing, regulatory or legal constraints, among others. Despite this, enterprises have been able to find ways to innovate and set up businesses that respond to social, economic and environmental needs.

Eco-dôme Maroc is a company that offers earth-based construction in a cost-effective manner while reducing the carbon footprint and respecting the local fauna and flora. It aims to address challenges facing access to infrastructure and services in the rural areas of Morocco, including in housing, education and tourism. The company's innovations include earthen formulations that adapt to different climates – dry or humid. Another innovation is the use of building information modelling technology, which enables the development of digital models of earthen constructions and simulates them under different mechanical and thermal conditions to reach a design that is optimal.

The company's impact can be observed in reduced energy consumption, especially that the earthen buildings do not use any heating or cooling systems; a reduced carbon footprint; and increased job opportunities in the rural areas of Morocco.

The company faced an internal challenge in building an enthusiastic team that understands the benefits of earth construction amidst cultural perceptions. External challenges mainly resulted from regulations that were put in place for construction using concrete. The company worked with authorities on finding solutions and focusing on the perceived benefits of using earth instead. Access to funds has also been identified as a challenge.

Based on information provided by
Youness Ouazri, Founder and CEO
Eco-dôme Maroc
Morocco

Craft Store is a company that connects small craft producers in the Sudan with customers through innovative approaches and offers services such as specialized training and business development support. Through its online platform, the company promotes Sudanese history and heritage and has ensured diversity by including vendors who have disabilities. Through Craft Store, 8,000 products have been sold across 10 countries, which represents a 95 per cent increase in vendors' sales.

The company has identified a few internal and external challenges. Internal challenges relate to coordination and alignment with the company's mission and values. External challenges relate to differing regulatory environments across countries when it comes to commerce. Partnerships have helped alleviate these challenges.

Based on information provided by
Azzam Elzain Abdelazim Ibrahim, Co-founder and CEO
Craft Store FZ LLC
United Arab Emirates/Sudan

Pine Tech is a start-up company that develops technological solutions for persons with visual disabilities. The company's product is an innovative white cane that detects obstacles and provides acoustic signals to the visually impaired person using it. It emits a light signal in dark surroundings to alert others to the person's movement. The main objective of this product is strengthening self-dependency and alleviating mobility risks to individuals with visual disabilities.

Based in the Syrian Arab Republic, Pine Tech's innovation efforts have faced difficulties in accessing financing. The current situation in the Syrian Arab Republic and challenges in accessing the value chain have been identified as additional hurdles.

Based on information provided by
Fatima Mosbah Alsmaeil, Co-founder and CEO
Pine Tech
Syrian Arab Republic

Note: The companies highlighted in this box were selected randomly among the many companies that contribute to the SDGs in the Arab region. Mention of any firm, product or licensed process does not imply endorsement by ESCWA or the United Nations.

1. Tunisia: The importance of legislation in transforming the start-up ecosystem

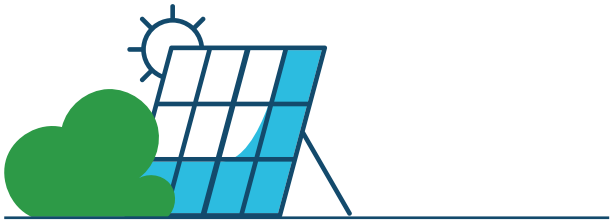
The Tunisian Startup Act of 2018 was a turning point for the country's start-up ecosystem. The Act encourages entrepreneurs to establish their start-up companies through legal and financial incentives, including a year-long stipend for entrepreneurs who choose to leave their employment to pursue the establishment of a company. The Act was complemented with circulars from the Central Bank of Tunisia and a financing framework covering venture capital investments, grants, a guarantee programme and other fundraising instruments. The start-up ecosystem in Tunisia is also host to incubators, accelerators and other support schemes.[50] Below are selected examples of successful start-up companies from Tunisia.[51]

- **InstaDeep** is an artificial intelligence company founded in Tunisia that succeeded in raising $100 million in Series B in 2022. Later, in 2023, BioNTech, a German biotech company, acquired InstaDeep for a value of $680 million.

- **Wattnow**, a Tunisian company that develops smart and sustainable energy management systems, was able to raise $1.3 million in pre-Series A funding in 2022.

- **GoMyCode** is an edtech company providing an online learning platform to countries in the Arab region and Africa. The company has trained over 30,000 students since its establishment in 2017 and has succeeded in 2022 in closing a deal on an $8 million Series A investment.

These three examples are some of the many success stories observed in Tunisia that show the impact of the country's Startup Act. The start-up ecosystem's online database includes over 850 start-ups which have all received the start-up label since 2019. The majority, more than 77 per cent, work on technology solutions and operate in technology-driven sectors such as agritech and foodtech (SDG 2), healthtech (SDG 3) and edtech (SDG 4).



Survey finding 6

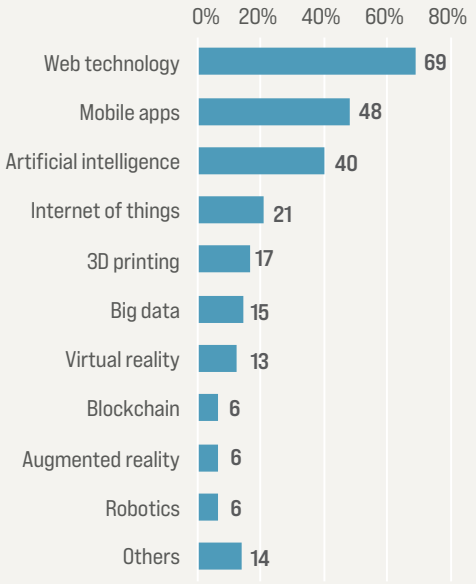
Web technology and mobile apps are the top technologies adopted or used, followed by artificial intelligence

Most enterprises (48 per cent) acquire and develop technologies in order to enhance their innovative capabilities. A reported 23 per cent only develop technologies and 15 per cent only acquire them.

Web technologies are used by 69 per cent of enterprises, followed by 48 per cent for mobile apps. These technologies, however, are not new and are already prevalent in enterprises seeking digitalization of their businesses.

The values significantly drop for emerging and new technologies such as the Internet of things, big data and virtual reality, which are used by close to, or less than, 20 per cent of enterprises. Blockchain, augmented reality and robotics are at 6 per cent each, which is not necessarily unusual, as these technologies have specific, specialized purposes and are not applicable in all types of businesses.

Interestingly, artificial intelligence is reportedly used by 40 per cent of enterprises.

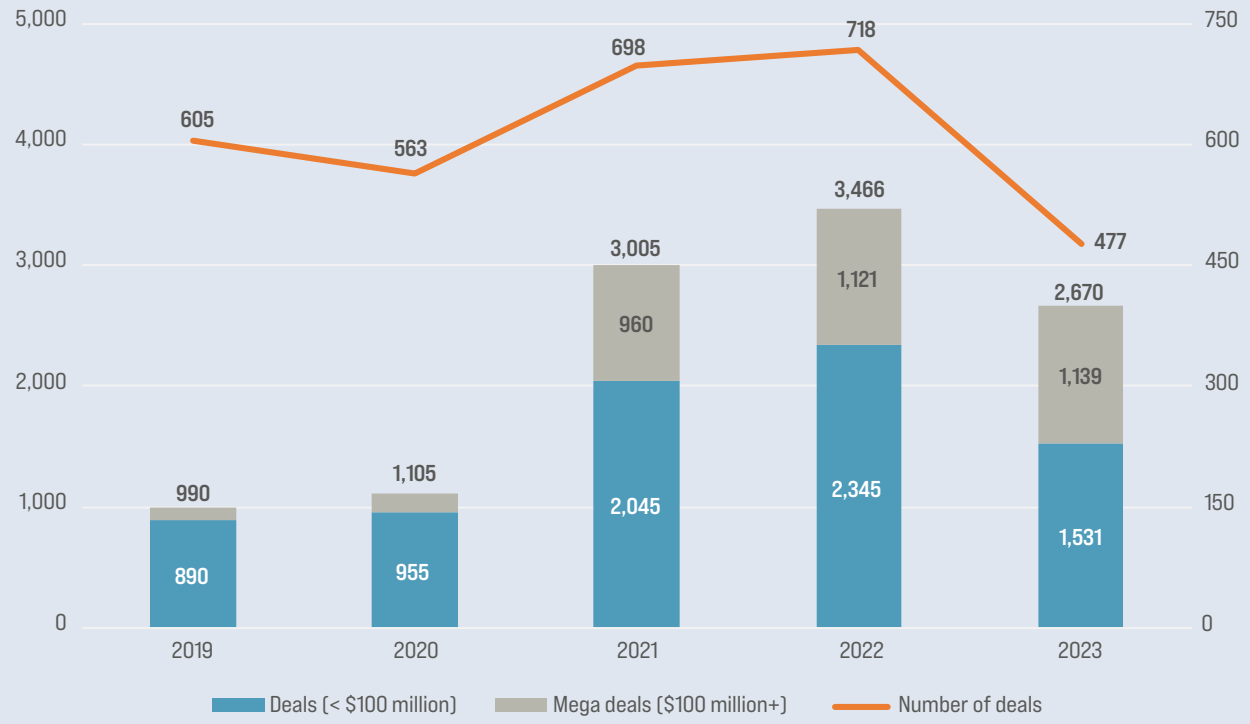


Source: ESCWA Survey on Innovation and Skills Development in Private Enterprises in the Arab Region, 2023.

2. For innovative start-ups, the key source of financing is venture capital, although financing could also come from equity, crowdfunding, government grants and personal donations

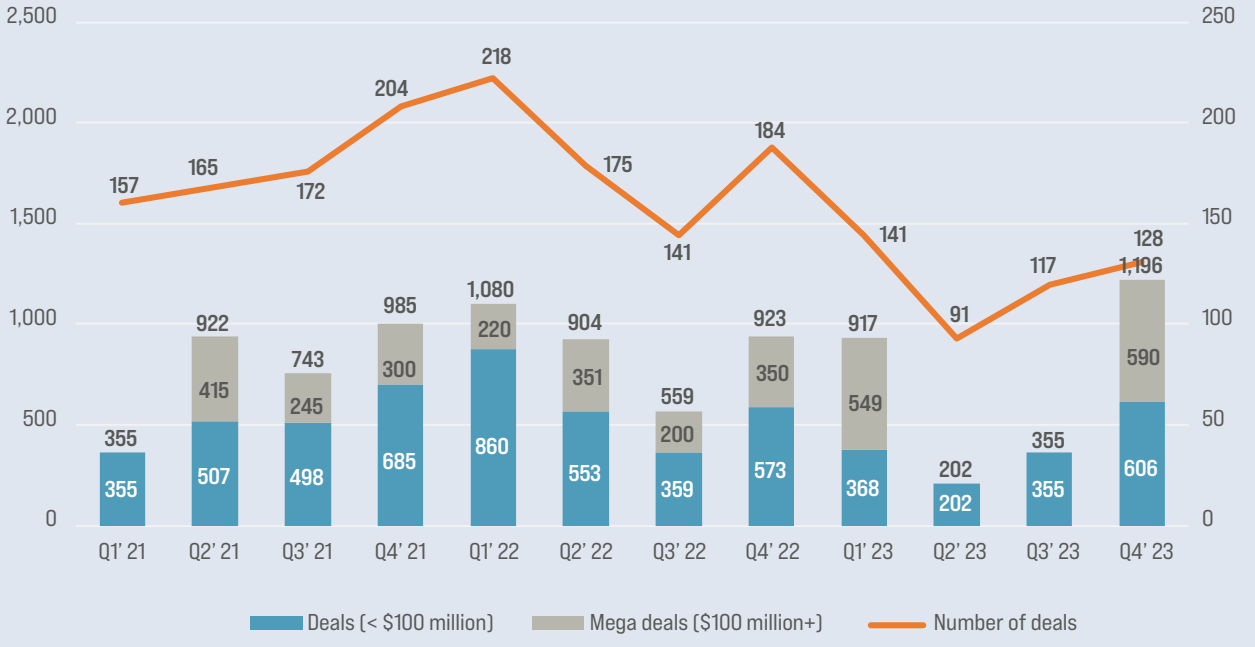
The 2023 edition of the Annual SDG Review highlighted the importance of private finance to bridge the SDG financing gap. It also concluded that in the Arab region, private financing is low and declining and faces mobilization challenges, albeit recent promising corporate finance deals have prioritized SDG-related sectors. **Venture capital in the region saw notable growth in 2021 and 2022, the two years following the start of the COVID-19 pandemic, but then declined by 23 per cent in 2023**, in line with a similar global downward trend.[52] In 2021, total venture capital in the region exceeded the $3 billion mark, more than double the amount in 2020 and higher than any previous year (figure 14). The fourth quarter of 2023 saw the highest amount of investments compared to the first three quarters of that year, resulting in total venture capital of $2.67 billion for 477 deals (figure 15), most of which were in the United Arab Emirates, followed by Saudi Arabia and Egypt. The distribution of venture capital across investment brackets varied considerably: in 2019, 80 per cent of investments were in the "less than $1 million" bracket, whereas in 2023, the percentage for the same investment bracket stood at 42.[53]

Figure 14. Regional venture capital funding amounts, 2019–2023 (Millions of dollars)



Source: Magnitt, 2024.

Figure 15. Quarterly growth of venture capital funding in the region, 2021–2023 (Millions of dollars (columns) and number of deals (line))



Source: Magnitt, 2024.

3. United Arab Emirates: An ambitious vision and targeted policies for supporting innovative entrepreneurs and small and medium-sized enterprises

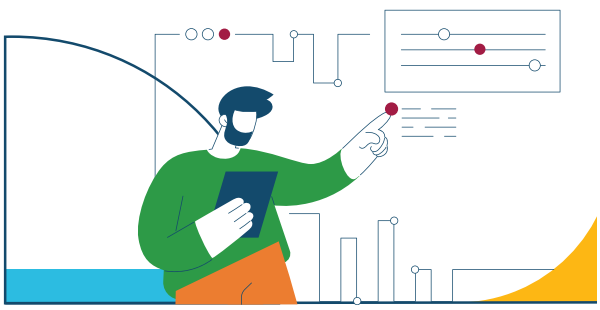
In the **United Arab Emirates**, a package of targeted policies has been put in place for building an innovative entrepreneurship system and enabling SMEs. In fact, the country ranked first globally on the "entrepreneurship policies and culture" indicator of the 2023 GII and fifth on the "policies for doing business" indicator. It also ranked eighteenth on the "venture capital investors" indicator, measured in terms of deals per billion purchasing power parity GDP. Support is offered through government institutions, funds, educational programmes, scale-up platforms as well as incentives such as a golden visa for entrepreneurs. The United Arab Emirates has set a target of increasing the number of SMEs from 558,000 in 2022 to 1,000,000 in 2030 and considers SMEs vital for economic diversification. The country also has plans for increasing the number of unicorn start-ups, which are companies with a value of over $1 billion.[54] Hub71 is one example of a platform established in Abu Dhabi to attract start-ups from around the world and provide them with connections to investors, company-building services, access to talent and other services. Start-ups at Hub71 operate in over 20 sectors, mostly technology driven, and have reportedly raised over $1.2 billion since 2019. As part of its support to green infrastructure and clean energy, Hub71 launched a programme targeting climate-focused start-ups (cleantech and climatetech) during COP28.[55] There are more than 80 investors in the United Arab Emirates, ranging from venture capital to accelerators, private equity and others which have invested in mega deals since 2018.[56,57] Some of these investors, such as DANA investments and WOMENA, are focused on women-led companies.

Although general attention to sustainability or environmental, social and governance (ESG) commitments has been gaining traction in private companies and banks, the level of attention across investors remains limited. MEVP is one example that has issued an ESG policy and conducted a mapping of its investment projects with the SDGs.

Below are two examples of recipients of mega deals in venture capital financing and how they link to the SDGs.[58]

- MTN-Halan is a fintech company based in Egypt that aims to provide banking services for the unbanked. The company provides unbanked and underbanked individuals with the opportunity to increase their financial capabilities and improve their financial literacy. It also targets MSMEs through loans and cashless financial solutions. The company views its paperless loan process as helping reduce greenhouse gas (GHG) emissions. Earlier in 2023, MTN-Halan raised $400 million in equity and debt financing from local and global investors. As part of its ESG compliance, the company reports that it contributes to eight SDGs.

- Pure Harvest Smart Farms is an agritech start-up in the United Arab Emirates working on sustainable farming through controlled-environment agriculture. The facility utilizes advanced on-site water treatment and handles the packaging of freshly picked produce and can yield around 60 tons per day. It also uses digital technologies and artificial intelligence for management of the farms. In its latest funding round in 2022, the company raised $180 million in equity financing. While Pure Harvest Smart Farms does not clearly map its activities to the SDGs, its values and social and environmental commitments link to at least five SDGs.

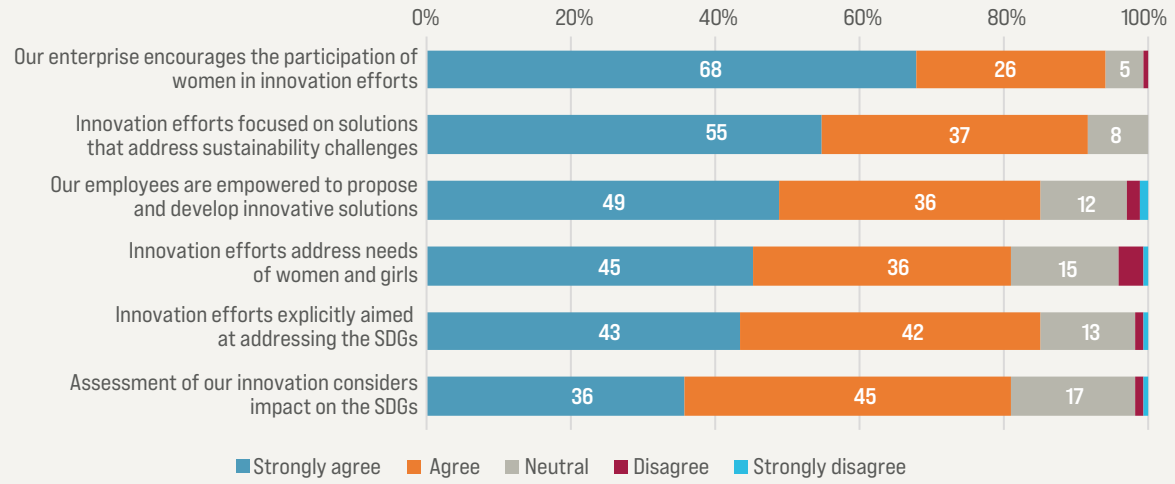


Survey finding 7

Innovation efforts do consider sustainability and are in some cases explicitly linked to the SDGs

Fifty-five per cent of enterprises have reported a strong focus of innovation efforts on developing solutions that address sustainability challenges. The majority also link their innovation efforts to the SDGs and assess them while considering their impact on the SDGs.

Close to two thirds of enterprises encourage the participation of women in innovation efforts, and 45 per cent place a strong emphasis on addressing the needs of women and girls in their innovation efforts.



Source: ESCWA Survey on Innovation and Skills Development in Private Enterprises in the Arab Region, 2023.

4. Jordan: The role of academia and scientific research in spurring innovation

According to the local innovation ecosystem model produced by MIT, "actors" are the "organizations, entities, and individuals who create, support, and enable innovation through their activities and interactions". These include Governments, businesses, non-profit organizations, academic institutions, R&D centres, networks and support schemes. **Jordan** has over 30 business support entities, including accelerators, incubators, co-working spaces and consulting services, some of which were established over 20 years ago. These entities, along with academic institutions, research centres and funds, have been working towards building a vibrant entrepreneurial ecosystem. It was in 2019 that the Jordanian Government restructured the Ministry of Information and Communications Technology into the Ministry of Digital Economy and Entrepreneurship. The Ministry's 2021–2025 public policy for entrepreneurship aims to build a legislative framework to enable the development of innovative solutions by entrepreneurs and improve regional and global competitiveness.[59] A mapping of the Jordanian innovation ecosystem has been developed by more than one entity involved in innovation. The maps developed by the ESCWA Technology Centre, the National Center for Innovation and Trip to Innovation (TTI) categorize stakeholders into at least six pillars. A common element across these maps is the link to academia and scientific research whereby academic institutions are partners in national innovation efforts or are hosts of innovation/entrepreneurship centres. Jordan is not new to attempts to strengthen collaboration between industry and academia. The "Faculty for Factory" programme, for example, was launched in 2003 to encourage industrial companies to engage with faculty members as researchers and advisers. The areas of collaboration include packaging, chemical industries and food supply, among others.[60]

An examination of business support schemes and innovation centres in Jordan reveals that SDGs and sustainability in general are not quite evident. While some refer to it in their mission statement or strategic goals, the link to sustainable development is not consistently apparent in programmes and activities. Below are examples of business support schemes that have clear links to sustainability.[61]

- Hassad Agritech Accelerator was founded in 2019 to support entrepreneurs in developing technology-based solutions to agricultural problems. Some of the areas of innovation include smart farming, water management, farming and robotics, and waste management. The World Food Programme has identified Hassad as a platform for exploring innovative start-ups. While the accelerator does not elaborate on linkages to the SDGs, at least five SDGs can be linked to its operations.

- Trip to Innovation (TTI) supports innovative entrepreneurs through its incubators in Irbid and Karak as well as donor-funded projects. It provides mentoring, training, consulting and networking. TTI hosts a Green Business Incubator through which projects were implemented to support entrepreneurs in upcycling, waste management and the circular economy. It also supports women entrepreneurs through its "She Innovate" and "Venture400" programmes.

The box presenting Survey Finding 8 is further confirmed by selected SMEs from the Arab region reporting financing as a challenge they face.

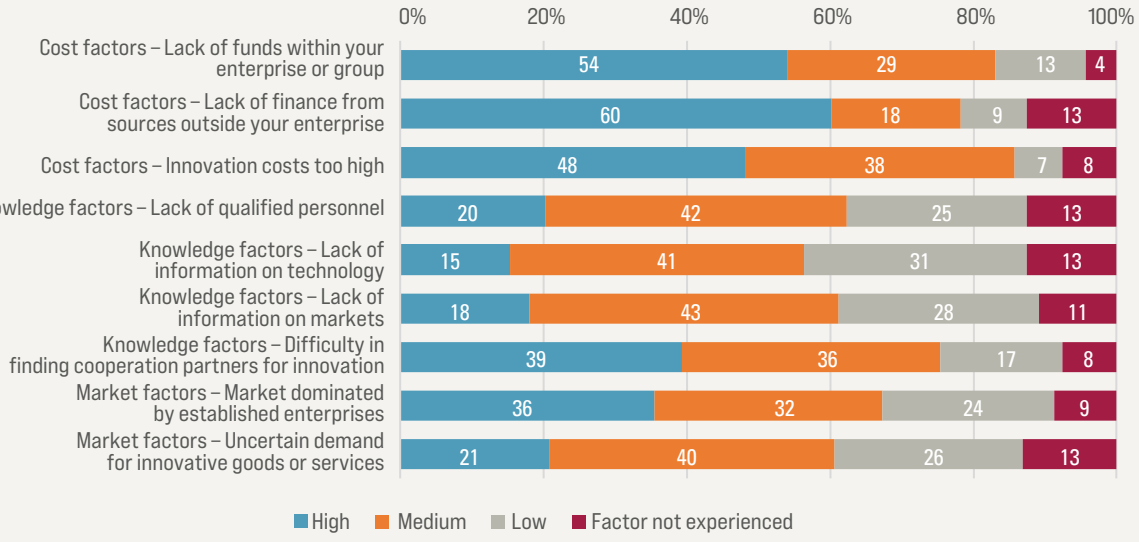
Survey finding 8

Financing is the most significant barrier to innovation in private enterprises

Challenges facing enterprises in engaging in innovative activities are notably skewed towards financing. More than half of the enterprises struggle with lack of funds as a major challenge whether from within the company or from external sources.

Finding partners to collaborate on innovation was also identified as a challenge of high importance by 39 per cent of enterprises. Interestingly, finding qualified personnel is only a major challenge for 20 per cent of companies. This is in line with findings from the enterprise surveys conducted by the World Bank, where 22 per cent of firms in the Arab region identified an inadequately educated workforce as a major constraint to business operations, as depicted in figure 7.

For 36 per cent of enterprises, market domination by existing companies is another significant challenge. Not surprisingly, information on technologies and markets is not quite a challenge and ranks low for at least one third of enterprises.



Source: ESCWA Survey on Innovation and Skills Development in Private Enterprises in the Arab Region, 2023.

C. The integration of innovation in large private businesses in the region

This section is based on a review of sustainability or ESG reports from 17 companies. The companies were selected using the following five criteria: (1) evidence of sustainability commitment either through ESG reports or membership in a regional/international body that observes sustainability, such as the United Nations Global Compact; (2) is Arab-established (i.e. is not a foreign affiliate); (3) is a large company (at least 250 employees); (4) geographic diversity (selected companies cover 10 Arab countries); and (5) sector diversity (selected companies cover four main sectors: banking; freight, logistics and supply chain; retail and consumer products; and telecom in addition to diversified businesses).

Sustainability reports, also known as ESG reports, are a valuable resource that reflects a company's strategic direction and commitment to sustainable development and highlights mechanisms or tools to implement it. The reports reviewed for the present study show that companies in the Arab region are cognizant of the importance of innovation both as a means to improve their business and as a way to engage with the community, including both experts and clients. Innovation is integrated in the company's vision, mission statement and/or commitments. It is also identified as a partnership principle or strategic investment option towards growth, solution finding and sustainability. As a result of the review, four trends can be identified: nurturing innovators, investing in innovation, building partnerships for innovation and deploying technology.

> **"With an increase in the pace of change in the business environment, driven by technological, social, and climate change factors, one of the main competitive advantages that a company should possess is the ability to constantly innovate."**
>
> **Source:** Zain, 2022.

Nurturing innovators: A company's human capital is a key driver of innovation. Reviewed reports exhibit how large companies in the Arab region have nurtured innovation among their staff or have engaged with stakeholders to spur innovation in the community. Company-level, or **internal**, innovation activities manifest as training programmes, competitions and provision of space for ideation and collegial discussion of new ideas. Training programmes are either technology focused or cover the concepts of entrepreneurship. **Externally**, driving innovation has also taken different forms such as hackathons for students on climate change or digitalization, which serve a double objective of finding solutions to community problems and guiding the company towards improving its business. Companies selling consumer products have developed and used online platforms to engage customers in the product design and obtain feedback on product improvement. Banks have launched SME awards and customized some of their SME products, loans specifically, to encourage innovative sustainable development practices, such as the Green Future Loans by Bank al Etihad in Jordan. iHub, the Arab Bank's innovation hub, provides employees with the space to connect with fintech start-ups and experiment with innovative solutions and prototypes. Some companies, namely banks, have established non-profit foundations as part of a comprehensive corporate social responsibility strategy with social, environmental and cultural objectives for community development. The Abdul Hameed Shoman Foundation established by the Arab Bank has been supporting scientific researchers through awards and funds and innovators through awards and training programmes. The Attijariwafa Bank Foundation holds similar objectives towards education. It is a partner in Injaz Al-Maghrib, an initiative to build entrepreneurial skills in students to which more than 1,650 bank employees have volunteered and provided nearly 23,900 hours of training for the benefit of 40,000 young INJAZ beneficiaries.

Investing in innovation: Companies in the region are not only experimenting with community engagement to spur innovation, but they are also investing in innovation and technology start-ups. Areas of investment are usually those that have the potential to drive innovation within the company's sector of operation. So, private banks are investing in fintech solutions whereas freight/logistics companies are investing in solutions that help decarbonize the supply chain. For example, the Arab Bank's Accelerator (Jordan) invests, collaborates and partners with early-stage technology start-ups that have the potential to disrupt the financial services sector or improve it. Agility Ventures, the corporate venture arm of Agility (Kuwait), invests in technology companies offering solutions for logistics and transportation, online freight

and low GHG emissions mobility. Zain Ventures has a geographically wide investment portfolio that focuses on user experience companies (known as "xtech").

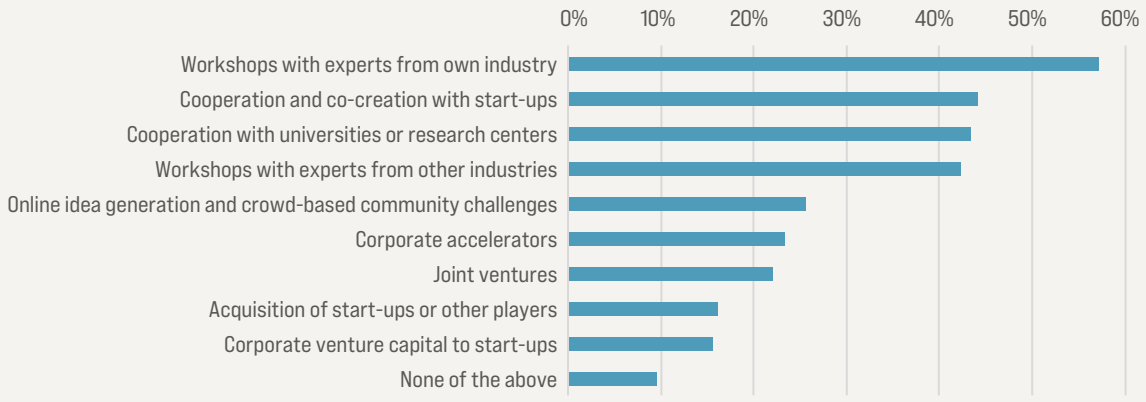
Building partnerships for innovation: When it comes to education, learning and research, universities are sought as partners. The exchange is in the form of academic programme development and delivery at the university or as internship opportunities for students at the company. The Commercial International Bank (Egypt) is developing, with Nile University, a track on sustainable SME financing as part of the school of business's curriculum. Collaboration with universities in R&D that is beyond only funding is not very common and is usually dependent on the company's sector of operation. SEKEM (Egypt), a holding operating in diversified sectors such as agriculture and pharmaceuticals, has a strong partnership with Heliopolis University to strengthen collaboration between researchers and practitioners. Recent areas of research have focused on organic agriculture, carbon sequestration and technology transfer. Mobily (Saudi Arabia) is part of a cooperative programme with universities that aims to bridge the gap between educational and practical experiences.

Deploying technologies: Digital transformation is high on the agenda of most stakeholders nowadays and more so for large companies. Digitalization is being used as a tool to improve efficiency, reduce costs, drive growth, enhance inclusivity especially for persons with disabilities, provide an improved and innovative user experience, and reduce paper use. Digital transformation in private banks in the Arab region is being implemented to offer customers access to electronic services as well as to digitalize the bank's operations, thus limiting paper use. Digitalization is additionally being used to automate internal bank operations; robots are put in place for automating routine tasks, and artificial intelligence helps detect fraud or misconduct in transactions. Freight and logistics companies use technology for supply chain transformation and efficiency. Agility (Kuwait) is investing in electric vehicles for shipments and in digitalized systems for customs management. Aramex developed a command centre for managing its shipments and has rolled out drone deliveries in Muscat and autonomous bot deliveries in the United Arab Emirates. Batelco (Bahrain) has "self-healing networks" that use artificial intelligence to automatically detect and fix outages, failures and breaches, thus ensuring continued network performance.

Survey finding 9

A variety of innovation activities engage different stakeholders such as experts, start-ups, universities and research centres

Approximately 57 per cent of enterprises responding to the survey participate in innovation activities through workshops with experts from their own industry versus 42 per cent with experts from other industries. Cooperation with start-ups and universities comes in close behind at 44 per cent and 43 per cent, respectively. Investing corporate venture capital in start-ups comes in last at 15 per cent.



Source: ESCWA Survey on Innovation and Skills Development in Private Enterprises in the Arab Region, 2023.

D. Action points

1. Governments

- Assess the country's efficiency in converting innovation inputs into outputs to determine which components of the innovation ecosystem are most in need of support or reform – funding, institutions, regulations, human capital and/or the market.
- Address the structural and social barriers facing women researchers, particularly in STEM fields, and their contribution to the production of knowledge. While the percentage of women pursuing a university degree in STEM disciplines is high, the numbers fall considerably when it comes to publishing and patenting.
- Adopt frameworks including coherent policies, laws, circulars and partnerships for building an enabling environment that nurtures innovative businesses, particularly those engaged in sustainability. Such frameworks should pay close attention to women-owned businesses.
- Alleviate challenges facing business formation and operation, including registration, licensing, permits, taxes and others, through legislation reform, process reengineering, and digitalization.
- Provide financial and legal incentives to entrepreneurs and innovative start-ups based on their level of development and especially those contributing to sustainability.

2. Private sector

- Increase attention to sustainability, or ESG commitments, in venture capital through sustainability reporting, mapping investments to the SDGs, and dedicating investment funds to sustainable enterprises.
- Proactively work with authorities in finding solutions to legal limitations or obstacles that hinder the development of innovative solutions, whether products or services. Showing evidence of the solution's social, economic or environmental benefits could help foster positive change.
- Invest in R&D, through increased funding and specialized personnel, to discover or develop innovative products that respond to market needs and solve local problems that are more prevalent in the region while at the same time considering affordability.
- Digitalize operations and production processes and acquire or adapt technologies that have the highest potential of improving an enterprise's efficiency and facilitating access to local markets and global value chains.

3. Academia

- Strengthen the links between R&D, particularly in STEM fields, and market needs both in terms of research areas and collaboration between academic institutions and enterprises. This will require a shift at the policy level and regulation of the relationship between academia and business.
- Instil a culture of innovation and entrepreneurialism in all STEM fields by integrating it into the academic curriculum and organizing venues for practical application such as hackathons and awards. Such events could be organized in collaboration with private sector partners.

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Endnotes

1 In this Review, the private sector is understood to include private enterprises and exclude the public sector. However, in some cases, due to data limitations, references to the private sector may include public or semi-public entities, such as State-owned enterprises.

2 World Bank, 2013; Liaqat and Nugent, 2015; EBRD and others, 2016; WEF, 2017; ESCWA, 2022; ESCWA, forthcoming.

3 According to the ILO School-to-Work Transition Surveys (SWTS), between 50 and 60 per cent of working youth in Egypt, Jordan, Lebanon, the State of Palestine and Tunisia were in occupations that did not match their education in 2013–2015 (ILO, 2016a, 2016b, 2016c, 2016d and 2016e).

4 In 2013–2015, undereducation was at least three times more prevalent than overeducation in Egypt, Jordan, Lebanon and the State of Palestine, and twice as prevalent in Tunisia (ILO, 2016a, 2016b, 2016c, 2016d and 2016e).

5 World Bank, 2006; Mason and Shetty, 2019.

6 UNESCO has not computed regional averages for the Arab region. According to the UNESCO Institute for Statistics, the North Africa and West Asia region is composed of 18 Arab countries (Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, the State of Palestine, the Sudan, the Syrian Arab Republic, Tunisia, the United Arab Emirates and Yemen) and 6 non-Arab countries (Armenia, Azerbaijan, Cyprus, Georgia, Israel and Türkiye). Notably, four Arab countries (the Comoros, Djibouti, Mauritania and Somalia) are excluded from the definition of North Africa and West Asia used by UNESCO.

7 Average primary and secondary education completion rates in the Arab region are lower than those reported for North Africa and West Asia since the rates in the four Arab countries excluded from the North Africa and West Asia region (as defined by UNESCO) are lower than those observed in the six included non-Arab countries.

8 ESCWA, 2020; Kraft, 2018; Ministry of Education and Higher Education, 2018; Alternative Policy Solutions, 2022.

9 UNESCO, 2021b.

10 Ricou and Moore, 2020.

11 El-Hamidi, 2018.

12 Investing in early education has been shown to offer a cost-efficient way to prepare children for successful transitions to higher levels of education and lifelong learning and to produce a well-trained and capable workforce (Vegas and Petrow, 2008; Berlinski and others, 2009; Naudeau and others, 2011; Sayre and others, 2015). For instance, in Colombia, a comprehensive community-based early childhood development intervention doubled children's third grade enrolment (Young, 1995), while in Türkiye, a mother-child education programme providing cognitive enrichment to children and training and support for mothers increased children's school attendance during their teenage years (Kagitcibasi and others, 2001).

13 UNESCO, 2021b.

14 ESCWA, 2023c. Soft skills, also referred to as common skills, are those prevalent across many different occupations and industries, including both personal attributes and learned skills. Hard skills, also known as specialized skills, are those primarily required within a subset of occupations or equip individuals to perform a specific task.

15 The fourth industrial revolution denotes a transition to a digital economy, characterized by a convergence of technologies that is erasing the boundaries between the physical, digital and biological domains (Schwab, 2016).

16 Four mini groups of the International Standard Classification of Occupations (ISCO) normally associated with the public sector were excluded from the sample: 011 (commissioned armed forces officers), 021 (non-commissioned armed forces officers), 031 (armed forces occupations, other ranks) and 111 (legislators and senior officials).

17 All Member States of the League of Arab States, except the Comoros, Djibouti, Somalia, the Sudan, the Syrian Arab Republic and Yemen.

18 ESCWA, 2023c.

19 World Bank, 2010; Tzannatos, 2013; ESCWA, 2023.

20 Nassar, 2010.

21 ESCWA, 2023.

22 ESCWA, 2011.

23 Salmon and others, 2018.

24 In contrast, only 28 per cent of firms rated the loss of unskilled workers as a major or severe constraint, underscoring the perception of more significant challenges linked to the loss of skilled workers. This discrepancy may be attributed to a number of factors, including an already limited availability of skilled workers prior to the conflict and a higher propensity among skilled workers to emigrate.

25 Formal training is characterized by a well-defined curriculum and structured learning activities, such as classroom sessions, seminars, lectures, workshops, multimedia presentations and demonstrations. It excludes onboarding or basic training aimed at familiarizing employees with standard operating procedures.

26 The high share indicated in Mauritania may be skewed due to the small sample size used in the survey conducted in this country.

27 The relatively high incidence of employee training among Moroccan SMEs could be related to the country's leading position on innovation outputs in the region (see section 2A).

28 EBRD and others, 2016; Islam and Gatti, 2022.

29 Sekkat, 2011.

30 Stone and Badawy, 2011; EBRD and others, 2016.

31 Stone and Badawy, 2011.

32 ESCWA calculations based on data from ILO (2023a).

33 Chankseliani and Anuar, 2019; UNESCO, 2021.

34 ESCWA, 2022.

35 Nagraj, 2021.

36 Narayan, 2022; Embassy of the Kingdom of Saudi Arabia, 2022.

37 Oracle, 2023.

38 ECOSOC, 2023.

39 This chapter of the Annual SDG Review includes a limited selection of innovation indicators that link to the private sector. This chapter is not a comprehensive analysis of all elements of an innovation ecosystem.

40 The values are the sum of resident and non-resident patents. Source: WIPO, 2023b.

41 Tambunlertchai and Petrescu, 2022.

42 Kanellia and Jorgenson, 2023.

43 ESCWA, 2019.

44 Note that a similar trend is observed in publishing by women in the region. Recent research has shown that "men authors obtain higher representation, research productivity, and seniority [publishing] on average between 11 and 51 per cent more than women". It also concluded that "women are more likely to stop publishing than men". Source: El-Ouahi and Larivière, 2023.

45 Saudi Arabia General Authority for Statistics, 2022.

46 For more information on these models, please visit: MIT, OECD and UNCTAD.

47 For more a detailed explanation of these components, please see https://www.unescwa.org/publications/innovation-policy-inclusive-sustainable-development-arab-region.

48 Including governance, registration, permits, financing, taxes, capacity-building, market access and others.

49 Algeria, Qatar, Saudi Arabia, the Syrian Arab Republic, Tunisia and the United Arab Emirates have SME laws. Algeria, Egypt, Jordan, Morocco, Oman and the State of Palestine have an agency or ministry dedicated to SMEs and/or entrepreneurship. Algeria, Iraq, Mauritania and Morocco have set up initiatives or programmes to facilitate the financing of such enterprises.

50 The Tunisian Startup Act of 2018.

51 Startup Tunisia, 2021; Startup Tunisia, 2022; TechCrunch, 2022; Startup Tunisia, 2023.

52 Crunchbase, 2023.

53 Magnitt, 2024.

54 United Arab Emirates Ministry of Economy, 2023.

55 Hub71, 2022.

56 Mega deals are those in excess of $100 million.

57 Magnitt, 2023a and Magnitt, 2023c.

58 C3 Programs and Services FZ LLC, 2022; Pure Harvest Smart Farms, 2023; Halan, 2023; MTN-Halan, 2023.

59 Jordan's Ministry of Digital Economy and Entrepreneurship, 2021.

60 Al-Abdallat and Tutunji, 2012.

61 The Venturex, 2023; World Food Programme, 2021; Trip to Innovation, 2023.

The ESCWA Annual SDG Review 2024, the third in the series, explores skills development, innovation and the private sector in the Arab region. Building on available information and data, the report offers insights into regional trends and gaps, supported by examples and case studies from selected Arab countries. It also builds on the results of a survey on innovation and skills development in private enterprises in the Arab region, conducted by ESCWA in October 2023, as well as on a reading of sustainability reports from selected companies from the region.

The Review provides a snapshot of skills development and innovation landscapes in the Arab region, assesses what the private sector is doing in each of the two domains, analyses the challenges it faces, and provides guidance on actions needed to address current gaps.

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