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Fostering Innovation in Small and Medium Enterprises in the Arab Region

Technology and Innovation with a Focus on the 2030 Agenda for Sustainable Development

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Technology and Innovation with a Focus on the 2030 Agenda for Sustainable Development

Fostering Innovation in Small and Medium Enterprises in the Arab Region



United Nations
Beirut, 2018

Acknowledgements

This report was prepared by Mr. Samir Aita, President of le Cercle des Economistes Arabes and an expert in economic and technology policy. The research and preparation was done in the framework of the 2018-2019 activities of the Technology for Development Division at ESCWA, specifically related to the role of innovation and technology for achieving the 2030 Development Agenda and its SDGs.

Peer review was done by Ms. Nibal Idlebi, Chief of the ESCWA Innovation Section.

Executive summary

The present report has been prepared under an ESCWA programme on innovation and technology towards achieving the 2030 Agenda for Sustainable Development, with a focus on micro, small and medium enterprises (MSMEs). This issue is of great importance given that it covers the largest share of economic actors in the Arab region, both in terms of employment and of contribution to economic added value.

Chapter I discusses how the Sustainable Development Goals (SDGs) focus on SMEs and innovation, especially SDGs 8 and 9. The United Nations indicators for the relevant targets are presented and the results of target 8.3, which mentions both innovation and SMEs, are given for Arab countries. The most recent results of the Sustainable Development Solutions Network's SDG index for Arab countries are also discussed: most countries appear far from achieving the SDGs, especially SDG9. The chapter also reviews the most recent results of the Global Innovation Index: except in a few cases, most Arab countries have seen their score and ranking decline.

Chapter II assesses the size and the role of MSMEs in Arab countries, based on the available literature. As in most developing countries, most MSMEs in Arab countries are informal firms. It also covers the database of the World Bank and the International Finance Corporation (IFC), and views on MSME density and the "shadow economy". There are significant discrepancies between the World Bank/IFC database and data from labour force surveys in Arab countries.

Chapter III describes the role of innovation policies for enhancing MSMEs in the Arab countries, based on the SME Policy Index. The eighth dimension of the Index clearly addresses promoting innovation. A comparison between the most recent results of the Index in 2013 and those of 2008 shows some improvements, since most Arab countries have developed innovation strategies on SMEs since 2008.

Chapter IV describes approaches to foster innovation in MSMEs. A distinction is made between rural and urban ecosystems. In rural areas, the informal sector is larger as most enterprises are households, and the implementation of innovation depends largely on policies affecting diverse actors. In contrast, cities allow close networking between entrepreneurs and other actors, such as capital angels, research institutions, universities and skilled labour, which has promoted the role of cities to the detriment of technology parks. Moreover, the urban ecosystem favours networking between technological and non-technological firms, the latter providing products and services that accelerate development.

Challenges facing MSMEs and innovation in selected Arab countries are discussed in chapter V. Although some Arab countries have formulated innovation strategies that partially address SMEs, large gaps and significant issues remain.

Chapter VI sets out conclusions and recommendations, highlighting that promoting innovation within MSMEs is critical to economic and social development in Arab countries. It is vital to undertake comprehensive assessments of MSMEs in the Arab region, to understand the level of innovation and technology use in MSMEs, and to evaluate their contribution to economic growth. Chapter VI also proposes a simplified scheme to address and assess MSME innovation issues by considering the complexity of their ecosystem and the three axes of vision, namely formalization, size and innovation development.

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Introduction

Practice and research have shown the implications of innovation and technology for improving human welfare, economic growth, industrial efficiency, and environmental protection. Innovation and technology have become key to finding solutions to the most pressing and persistent social, economic and environmental needs and challenges communities face today. To find solutions, innovation is applied in product design, processes, services, marketing and institutional structures. The rapid advancement of technology is providing myriad solutions that support innovative activities and initiatives.

The 2030 Agenda for Sustainable Development includes the Sustainable Development Goals (SDGs) that affirm the importance of innovation and technology. The 2030 Agenda acknowledges the importance of involving various stakeholders in achieving the SDGs, and the responsibility of all actors in contributing to their fulfilment. Consequently, it calls on the private sector, including micro, small and medium enterprises (MSMEs), to actively engage in this global movement. Several SDGs and targets address these issues directly or indirectly, revealing an overlap between innovation and technology and SMEs (SDGs 8 and 9).

Although ambitious, the SDGs have opened doors for new business opportunities. SMEs can now embark on new endeavours to address goals in different sectors. Tackling climate change problems, for example, requires innovation in products and processes that consume water, energy and other environmental resources to reduce the negative impact on the environment. Integrating innovative technologies in food production or agri-food production is also an option for improving food security and more affordable access to food products with a longer shelf life. The health sector has seen notable growth in innovations that integrate technologies and human wellbeing into wearables and mobile applications, as well as pro-poor innovations that make healthcare products more affordable to rural and impoverished communities.

To better understand the potential impact of MSMEs in achieving the SDGs, it is necessary to know the size and role of such enterprises in the Arab region. An important component to consider in the study of MSMEs is the informal sector, comprising enterprises that are considered outside of formal arrangements that apply to organizations. Many MSMEs fall into this category, so it is essential to consider the impact that the informal sector could have on technological innovation and economic growth. Another important element to consider is that MSMEs in rural areas require different development approaches than those in urban areas.

A suitable business ecosystem is necessary to ensure that MSMEs contribute effectively to economic growth and social development. Those ecosystems should be adaptable to the type and size of the enterprise and include policies, strategies, plans, initiatives, programmes and organizations to support MSME development. Examples of countries with such initiatives include Egypt, Lebanon, Oman, Qatar and the United Arab Emirates. However, despite the formulation of strategies and supportive initiatives, MSMEs in the Arab region still experience challenges in effectively contributing to economic growth, sustainable development and SDG achievement. Those challenges must be addressed to ensure that MSMEs develop effectively, and to give informal MSMEs a chance to formalize.

The proliferation and growth of MSMEs supports economic growth and results in decent employment opportunities, especially in the Arab region that suffers from the highest youth unemployment rate globally. The uptake of new technologies and the integration of innovation into enterprises' operations is expected to enhance competitiveness, improve efficiency, reduce costs and enhance product and service quality. However, for innovation to thrive, a conducive business environment is needed. Unfortunately, MSMEs in the Arab region continue to face business and regulatory barriers and difficulties in accessing finance. Consequently, most are reluctant to allocate resources to innovation and to formalize employment.

I. INNOVATION AND SMES IN THE CONTEXT OF THE SDGS

A. INNOVATION, SMES AND THE SDGS

Innovation and SMEs are two economic drivers seldom addressed simultaneously in the literature on the SDGs or on social and economic development. Innovation and SMEs concern almost all the SDGs, although only the following two Goals focus specifically on those drivers:

- **SDG 8:** Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all;
- **SDG 9:** Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

Innovation as a driver is mentioned in the following targets:

- **Target 8.2:** Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors;
- **Target 9.4:** By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities;
- **Target 9.5:** Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending;
- **Target 9.B:** Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities;
- **Target 9.C:** Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020.

SMEs as a driver are mentioned in the following target:

- **Target 9.3:** Increase the access of small scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets.

Target 8.3 is the only one that mentions both innovation and SMEs, as follows:

- Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services.

SDG 8, where both drivers converge, concerns inclusive growth and decent work, thus linking both drivers to informal employment, which refers to activities not covered or insufficiently covered by formal arrangements, leading to greater worker vulnerability and poverty. Most people enter informal employment because of a lack of formal opportunities.¹ Innovation could create opportunities to tackle the challenges posed by informal employment; however, the disruptive nature of innovation could also contribute to the expansion of the informal sector.

¹ ILO, 2015.

B. MEASURING PROGRESS TOWARDS THE SDGs

Several indicators have been officially adopted to measure countries' progress towards achieving the 2030 Agenda and the SDGs.² The following indicators are associated with the targets described above:³

SDG 8:

- Target 8.2: Indicator 8.2.1: Annual growth rate of real GDP per employed person;
- Target 8.3: Indicator 8.3.1: Proportion of informal employment in non-agriculture employment, by sex.

SDG 9:

- Target 9.3:
 - Indicator 9.3.1: Proportion of small-scale industries in total industry value added;
 - Indicator 9.3.2: Proportion of small-scale industries with a loan or line of credit;
- Target 9.4:
 - Indicator 9.4.1: CO2 emission per unit of value added;
- Target 9.5:
 - Indicator 9.5.1: Research and development expenditure as a proportion of GDP;
 - Indicator 9.5.2: Researchers (in full-time equivalent) per million inhabitants;
- Target 9.B:
 - Indicator 9.B.1: Proportion of medium and high-tech industry value added in total value added;
- Target 9.C:
 - Indicator 9.C.1: Proportion of population covered by a mobile network, by technology.

C. SDG INDEX FOR ARAB COUNTRIES

The Sustainable Development Solution Network (SDSN) was established in 2012 under the auspices of the United Nations Secretary-General. SDSN mobilizes global scientific and technological expertise to promote practical solutions for sustainable development, including the implementation of the SDGs and the Paris Agreement. It issues a yearly SDG Index and Dashboards Report showing progress towards the SDGs, highlighting ranking progress and addressing key issues of importance.⁴

The 2017 SDG Index and Dashboards Report was published in July 2017. The report shows that among Arab countries, Algeria ranked the highest (64), followed by Tunisia (65) and Morocco (73).⁵ Most Arab countries appear to be far from achieving the SDGs, including SDGs 8 and 9 (table 1). The report states that countries across the Arab region should do more overall to promote innovation and investments in communication.

In 2018, the report showed a shift in the rankings of the top three Arab countries, with the United Arab Emirates (60), Algeria (68) and Morocco (77) receiving the highest ranks in the region. However, owing to

² <https://sustainabledevelopment.un.org/sdgs>.

³ The importance of informal employment is clearly indicated in target 8.3, 9.3.1 and 9.3.2.

⁴ The SDG Index can be accessed on <http://www.sdgindex.org/>.

⁵ SDSN, 2017. The United Arab Emirates ranked 77, Jordan ranked 80, Lebanon ranked 86, Egypt ranked 87, Bahrain ranked 92, Oman ranked 94, Qatar ranked 98, Saudi Arabia ranked 101, Kuwait ranked 102, the Syrian Arab Republic ranked 115, Iraq ranked 118, Mauritania ranked 133, the Sudan ranked 139, Yemen ranked 140, and Djibouti ranked 141.

changes in the indicators, the SDG Index rankings and scores for 2017 and 2018 cannot be compared, therefore variations between the two reports do not necessarily indicate a change in SDG performance. A trend analysis shows that achievements in implementing the SDGs are either consistent or increasing in most Arab countries, but some downward trends have been indicated, mainly for SDG 13 on climate action.⁶

Table 1. SDG Dashboard of Arab countries, 2018

Countries	No poverty	Zero hunger	Good health & wellbeing	Quality education	Gender equality	Clean water and sanitation	Affordable, clean energy	Decent work and economic growth	Industry, innovation and infrastructure	Reduced inequalities	Sustainable cities and communities	Responsible consumption and production	Climate action	Life below water	Life on land	Peace, justice and strong institutions	Partnerships for the SDGs
Algeria																	
Bahrain																	
Egypt																	
Iraq																	
Jordan																	
Kuwait																	
Lebanon																	
Libya																	
Morocco																	
Oman																	
Qatar																	
Saudi Arabia																	
Sudan																	
Syrian Arab Republic																	
Tunisia																	
United Arab Emirates																	
Yemen																	

Source: SDSN, 2018a.

Notes: The green boxes denote achieving the maximum for each indicator and the threshold for achieving the SDGs. The yellow, orange and red boxes indicate increasing distance from SDG achievement, respectively. The grey boxes indicate where no data are available.

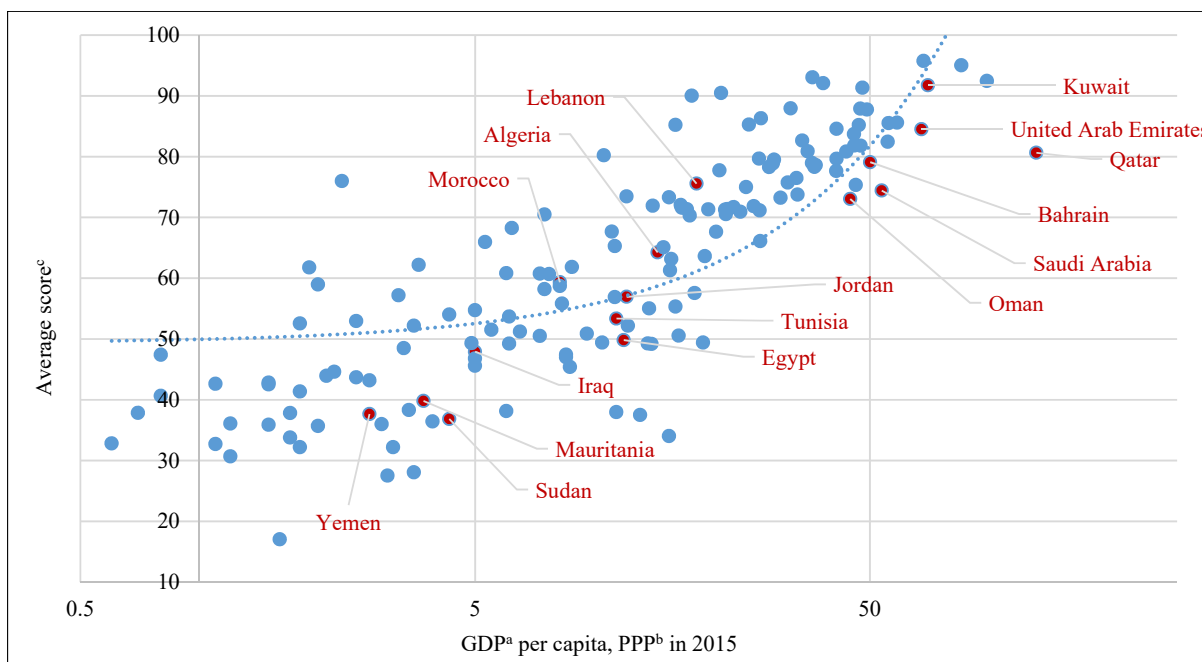
The 2017 report introduced data on spillover effects: how a country's policies can negatively or positively affect the SDG achievements of other countries in terms of the environment;⁷ economy, finance and

⁶ SDSN, 2018a.

⁷ By measuring the impact of trade on carbon dioxide emissions, groundwater depletion, biodiversity loss embedded, reactive nitrogen, transboundary air pollution, air pollution embodied in trade, etc.

governance;⁸ and security.⁹ It concludes that high-income countries tend to generate negative SDG spillover effects for poorer developing countries.¹⁰ Some Arab countries are among those generating the largest negative spillovers, including Israel, Qatar and the United Arab Emirates. All Gulf countries have large environmental spillovers, mostly related to groundwater depletion. The 2018 report confirms the findings of the 2017 report in that the Gulf countries create high spillover effects, which negatively impact their performance in the SDG Index.¹¹

Figure 1. SDG Index on decent work and economic growth (SDG 8), 2017



Source: Author's calculations based on SDSN (2017).

Notes: ^a In thousands of United States dollars.

^b PPP: Purchasing Power Parity.

^c The SDG Index score signifies a country's position between the worst (0) and best (100) outcomes.

Concerning SDG8 on decent work and economic growth, middle-income Arab countries perform well on average, while both low and high-income Arab countries perform below their international counterparts. Figure 1 shows each Arab country's achievement towards SDG 8 indicators in 2017 in terms of GDP per capita, and how they compare with other countries with similar GDP per capita.

Qatar is assessed as a clear underperformer in terms of GDP per capita, along with most low-income Arab countries.¹² The indicator for Lebanon is questionable as it is considered a good performer, although informal employment has spread among Lebanese workers, and Syrian, Palestinian and other foreign workers.¹³

⁸ By measuring low official development assistance compared with the internationally agreed 0.7 per cent of GNI, tax heavens, financial secrecy, etc.

⁹ By measuring exports of conventional weapons systems, etc.

¹⁰ SDSN, 2017, p. 9.

¹¹ SDSN, 2018a.

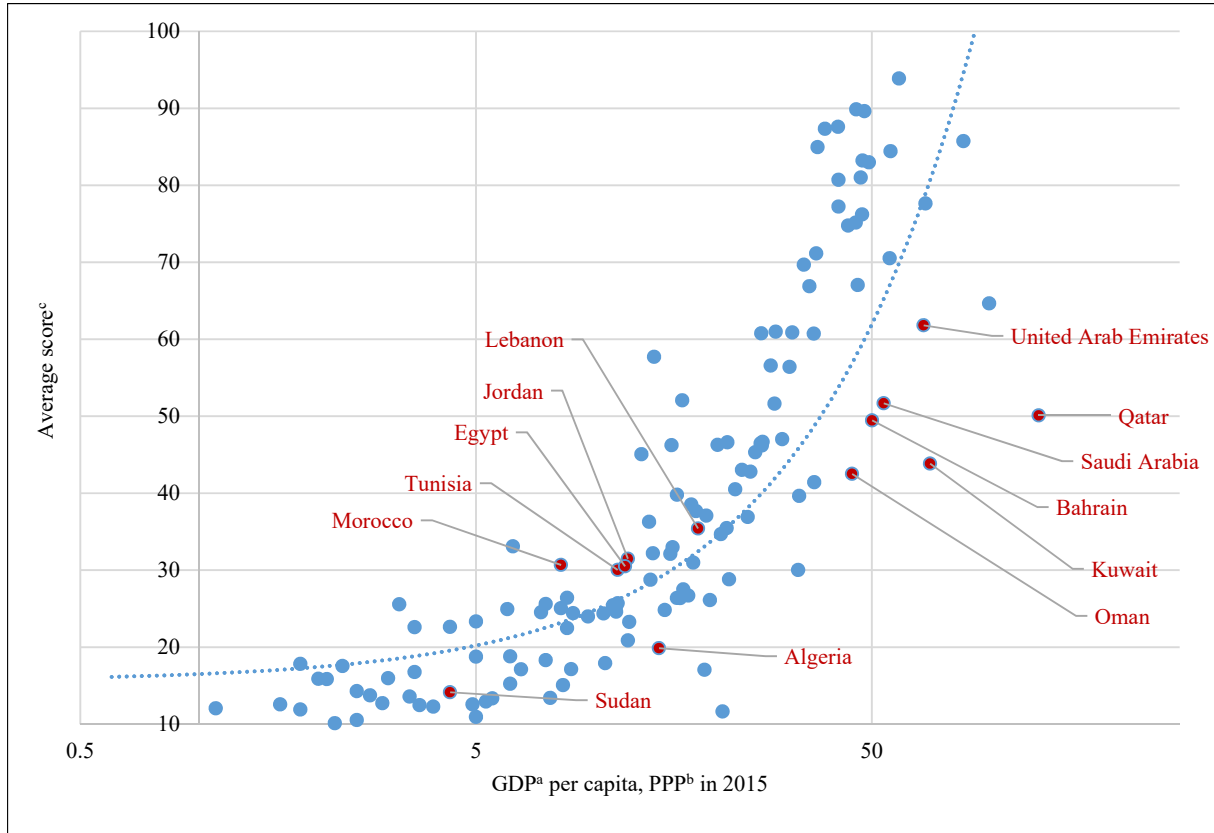
¹² Each country is compared with its international counterparts with similar GDP per capita (PPP).

¹³ Aita, 2017a.

It is worth noting that the SDG Index for Goal 8 adopts different indicators than the officially defined ones, including adjusted growth to income level; percentage of children 5-14 years involved in child labour; percentage of adults (> 15 years) with a bank account; and the unemployment rate. The 2018 report indicators include adjusted growth to income level; the slavery score; adults (> 15 years) with an account at a bank, other financial institution or mobile-money-service provider; the unemployment rate; the employment-to-population ratio; and youth not in employment, education or training.¹⁴

Moreover, the SDG indices of 2017 and 2018 for Goal 8 do not include decent work, a measurement of informal employment, except for the inclusion of an indicator on the slavery score in 2018. In addition, no data are considered for SMEs and their contribution to the economy.

Figure 2. SDG Index on industry, innovation and infrastructure (SDG 9), 2017



Source: Author's calculations based on SDSN (2017).

Notes: ^a In thousands of United States dollars.

^b PPP: Purchasing Power Parity.

^c The SDG Index score signifies a country's position between the worst (0) and best (100) outcomes.

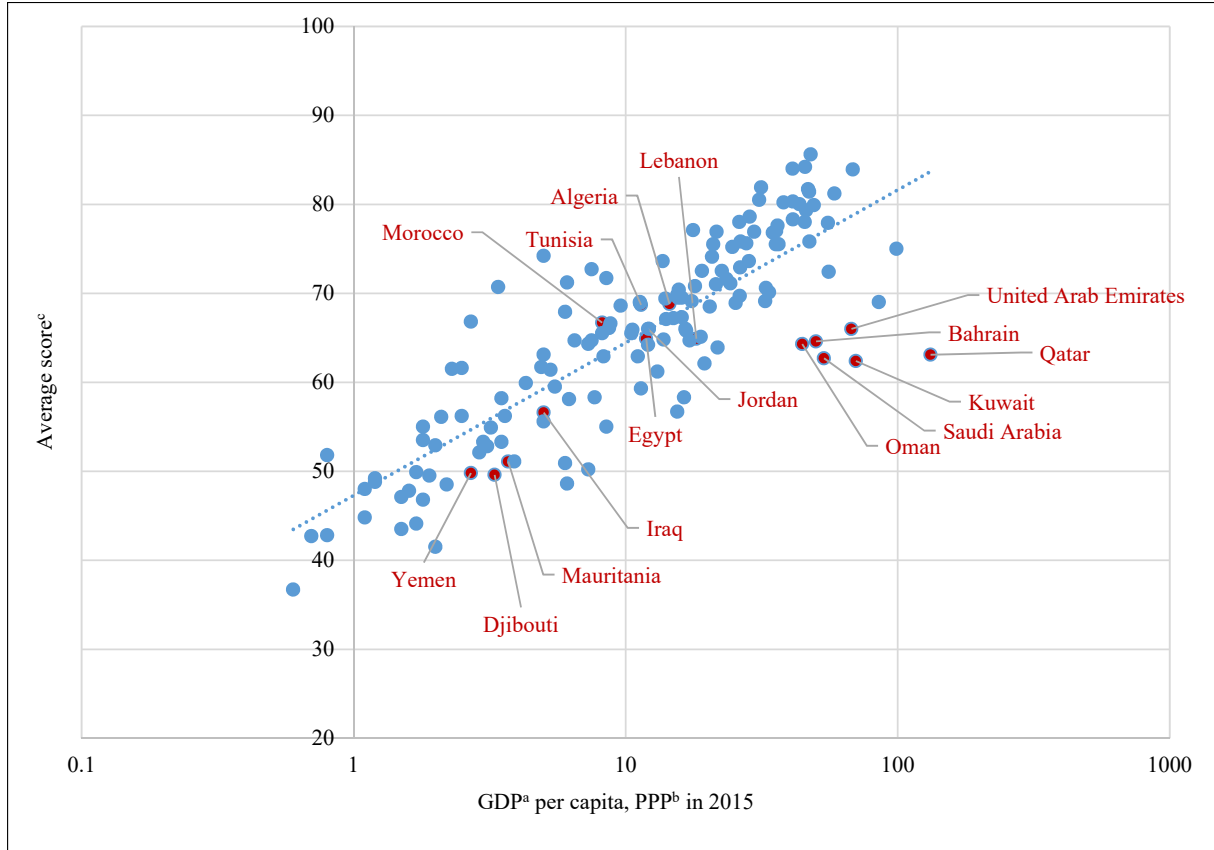
The 2017 SDG index for Goal 9 on industry, innovation and infrastructure shows similar features for Arab countries as SDG 8 (figure 2). However, middle-income Arab countries appear well above the international average (except Algeria), and high-income countries are well below. Qatar and Kuwait are clearly indicated as underperformers in the report.

Moreover, the SDG Index adopts specific indicators for Goal 9, namely the proportion of the population using the internet; mobile broadband subscriptions per 100 inhabitants; quality of overall infrastructure;

¹⁴ SDSN, 2018a, p. 49.

the Logistics Performance Index; QS World University Rankings, average score of the top three universities; number of scientific and technical journal articles, and research and development expenditure as a percentage of GDP.¹⁵ The 2018 report includes additional indicators to those of 2017, namely the number of triadic patent families filed per million population, the gap in internet access by income and the percentage of women in science and engineering.¹⁶

Figure 3. Overall SDG Index scores, 2017



Source: Author's calculations based on SDSN (2017).

Notes: ^a In thousands of United States dollars.

^b PPP: Purchasing Power Parity.

^c The SDG Index score signifies a country's position between the worst (0) and best (100) outcomes.

The global SDG index for all Goals shows similar behaviour among low, middle and high-income Arab countries (figure 3) vis-à-vis these indicators.

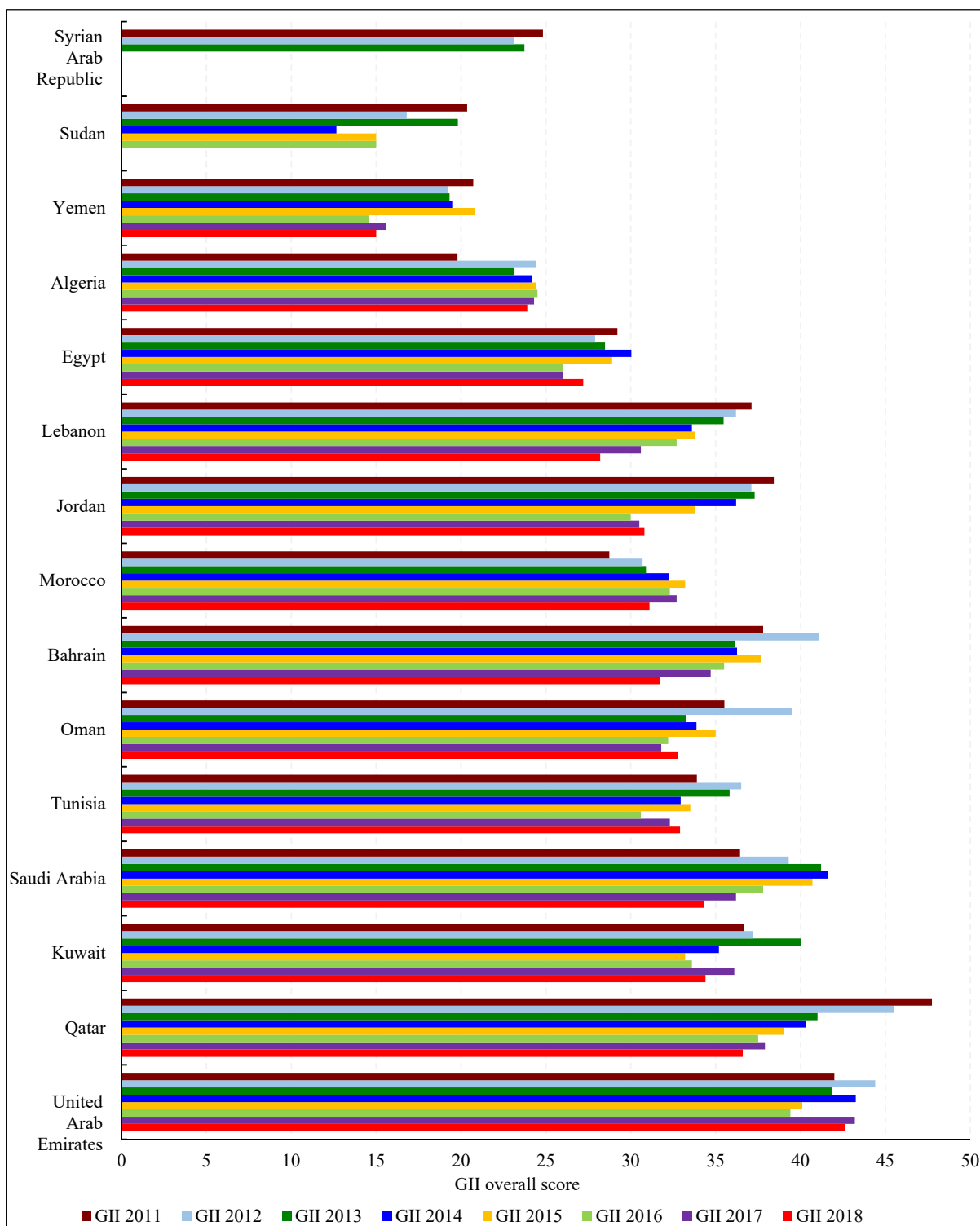
D. GLOBAL INNOVATION INDEX FOR ARAB COUNTRIES

The Global Innovation Index (GII) was developed by Cornell University, INSEAD and the World Intellectual Property Organization, which publish a yearly report ranking world economies' innovation capabilities and results. The GI is considered the most relevant measure of progress on innovation.

¹⁵ SDSN, 2017.

¹⁶ SDSN, 2018a.

Figure 4. Evolution of the Global Innovation Index in Arab countries, 2011-2018



Source: Compiled by author.

Note: The overall GII score is the simple average of the input and output sub-index scores.

The 2017 GII report showed no major change in the score and ranking of Arab countries.¹⁷ Only the United Arab Emirates improved its score from 39.4 to 43.2 and rank from 41 to 35;¹⁸ however, it was not considered an innovation achiever¹⁹ among high-income countries. In 2018, Arab countries' scores also showed little change, with most scoring marginally lower than the previous year. The United Arab Emirates remains the highest ranking Arab country, with a score of 42.6 and a ranking of 38; while Egypt improved its ranking the most, moving to 95. Tunisia was identified as an innovation achiever in 2018 among low-middle income countries, meaning that it outperformed on innovation relative to its development level. Only Egypt, Jordan and Morocco were identified as performing as expected for their levels of development, while the remaining Arab countries performed below expectations.²⁰

Analysing the evolution of GII since its inception in 2011 paints a clearer picture of progress in innovation (figure 4). Most Arab countries depict low or no progress, and some have even shown a decline over this longer timeframe. Only Algeria and Morocco indicate sustained progress.

The focus of the 2017 GII report was on the impact of innovation as a key driver of sustainable agriculture and food security. It stressed the role of innovation in water management, referencing the World Bank: 14 of the 20 most water-scarce countries in the world are located in the Middle East and North Africa (MENA) region.²¹ Desalination plants played a critical role, but are energy and resource intensive, and must be made to rely on concentrating solar power (CSP). However, given the high costs associated with CSP, the public and private sectors will need to work together to ensure broader adoption.

The agriculture sector plays a key role, as it is still a major source of production and employment in many Arab countries. The report notes that agricultural activities and related innovations often take place at the farm or household level (especially in cases of subsistence farming), not in private-sector firms as captured by most data collections. Statistically, however, capturing activity in the informal sector or at the grassroots level is challenging.²² This insight highlights the problems of SMEs in Arab countries that are mostly informal, in agriculture and in the manufacturing and services sectors.

The 2018 GII report focuses on energy. As the world's energy demand grows exponentially, it is also increasing demand for technological innovation to meet energy demands and to promote changes in societal norms and cultures. These demands have led to an energy transition, with countries such as Saudi Arabia and the United Arab Emirates supporting the innovative development of renewable energy resources. The focus on alternative forms of energy, and on meeting the demands of growing populations, has an impact on MSMEs as consumers of energy and as possible providers or energy solutions.²³

The other main issue addressed in the report concerns the regional clusters of inventive activities, addressing subnational policies and institutions, physical and economic geography, social networks, and local labour market linkages. The localization of the addresses of patent depositors of the Patent Cooperation Treaty allowed the visualization of such clusters of innovation around specific cities. The visualisation shows that there are no clusters located around any Arab cities under the top 100 clusters, a trend that continued in 2018.²⁴

¹⁷ Dutta and others, 2017.

¹⁸ The scores cannot be directly compared because calculation methods differ between editions.

¹⁹ Economies that perform at least 10 per cent above their peers for their level of GDP are called "innovation achievers".

²⁰ Dutta and others, 2018.

²¹ Dutta and others, 2017, p. 93.

²² Dutta and others, 2017, p. 73.

²³ Dutta and others, 2018.

²⁴ Dutta and others, 2017, p. 159.

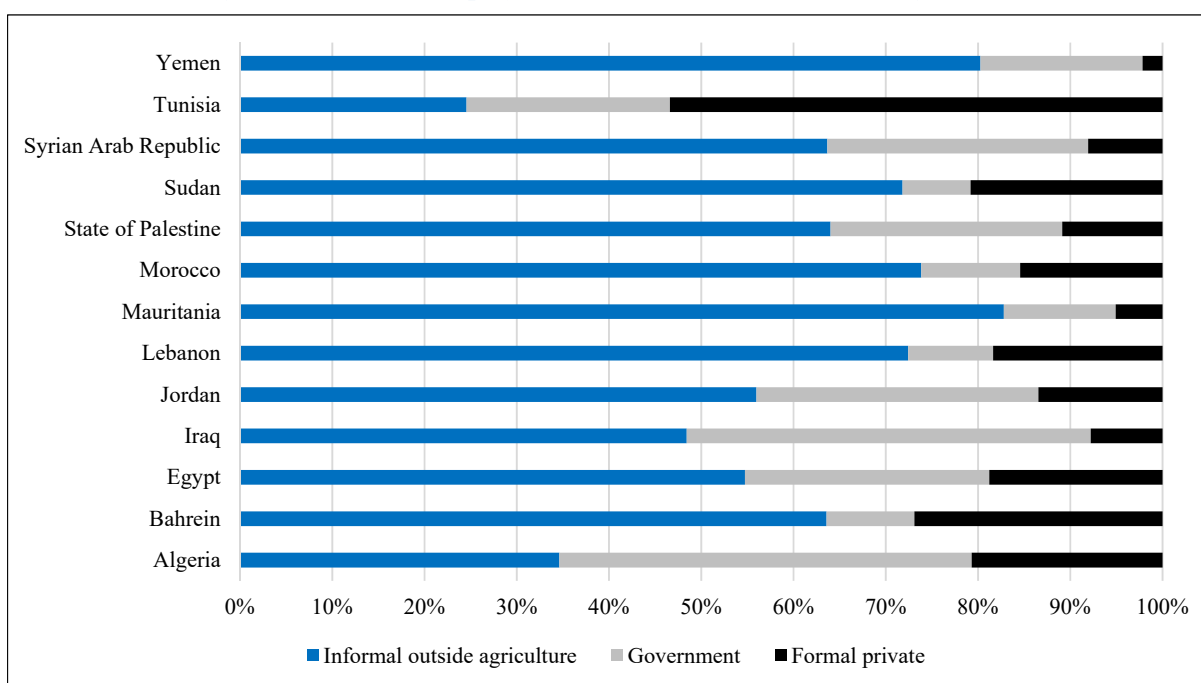
E. ASSESSMENT OF SDG TARGET 8.3

This chapter, on the general assessment of Innovation, SMEs and the SDGs for the Arab countries, could be best complemented by showing the results of the official indicator for target 8.3 indicator, namely the Proportion of informal employment in non-agriculture employment, by sex.

In 2018, the International Labour Organization (ILO) reported that 2 billion people worldwide (61.2 per cent of the world's population), of which 740 million are women, were informally employed. This percentage dropped to 50.5 when agriculture was excluded from the calculation.²⁵

Around 68.6 per cent of those employment in Arab countries (including agriculture)²⁶ are informally employed (60.9 per cent in the informal sector and 7.5 per cent in the formal sector).²⁷ A 2017 report²⁸ assessed informal employment (outside of agriculture) for 13 Arab countries (figure 5). Except for Tunisia and Algeria, informal employment outside agriculture was well above 50 per cent per cent of the total non-agricultural employment, reaching 80 per cent per cent in Mauritania and Yemen.

Figure 5. Informal employment in Arab countries, outside agriculture



Source: Aita, 2017.

Since the government and the public sector are the largest employers in Algeria, this influences overall employment in the informal sector and the salary scale in the country. It also plays a significant role in Iraq, Egypt, Jordan, the State of Palestine and the Syrian Arab Republic (based on 2010 figures, prior to the conflict).

²⁵ ILO, 2018.

²⁶ The ILO grouping of Arab States includes Bahrain, Iraq, Jordan, Kuwait, Lebanon, the State of Palestine, Oman, Qatar, Saudi Arabia, the Syrian Arab Republic, the United Arab Emirates and Yemen. It excludes the countries of Northern Africa, namely Algeria, Egypt, Libya, Morocco, the Sudan, Tunisia and Western Sahara.

²⁷ ILO, 2018.

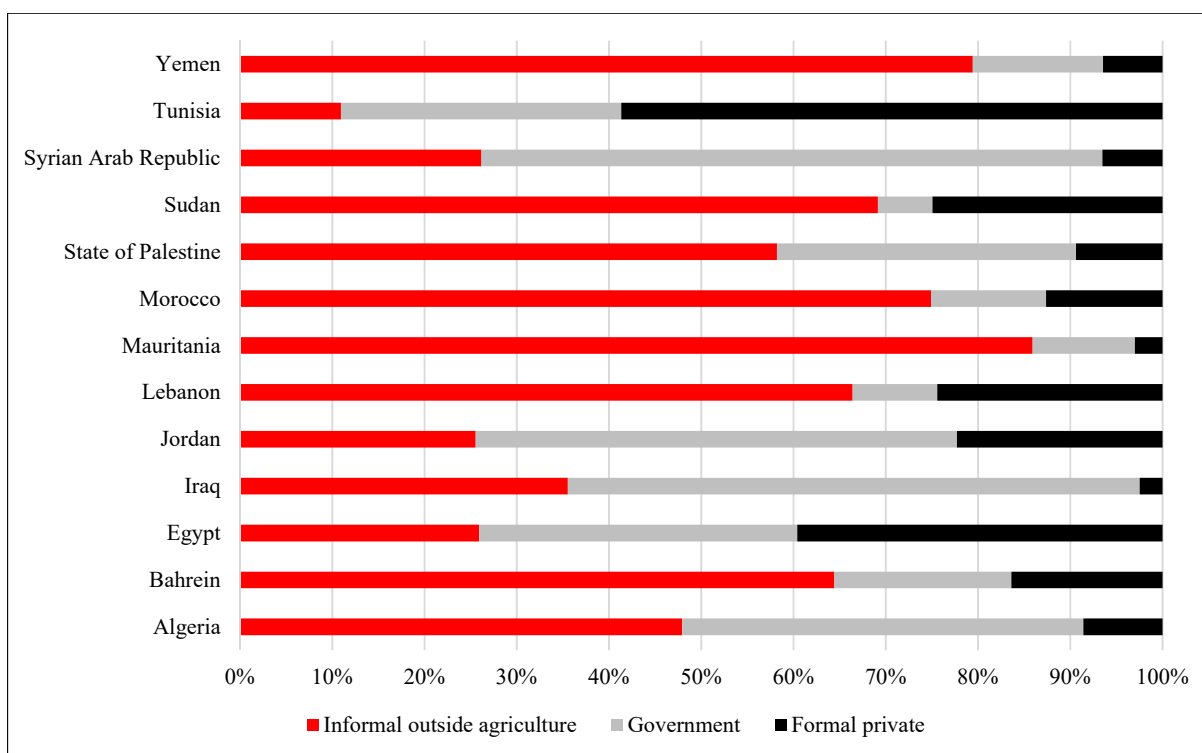
²⁸ Aita, 2017a.

Arab countries, except Tunisia (which has an exceptional record in the formalization of employment), scored low compared with world counterparts in terms of total informal employment outside agriculture.²⁹

The situation for women is different. Of all those employed informally in Arab countries (including agriculture), 70.2 per cent are male and 68.1 per cent are female, mainly between the ages of 14 and 25 with no education or only primary education. Excluding agriculture reduces the percentages for both men and women to 66.5 per cent and 49.6 per cent, respectively. This indicates that more women than men are informally employed in agriculture.³⁰

ILO found that the lower the general participation of women in the labour force, the less likely they were to be informally employed.³¹ This was especially true in North Africa and other Arab countries. Public sector employment plays a much greater role for women, as it is commonly the only sector providing them with full rights (figure 6).³²

Figure 6. Informal employment of women in the Arab region, outside agriculture



Source: Aita, 2017.

The analysis of SDG 8, especially target 8.3, shows that many countries in the Arab region are not growing fast enough and that the unemployment rate throughout the region is high, leaving the informally employed vulnerable to poverty, abuse and inequality.³³

²⁹ These figures mostly represent men, as women's participation in the labour force in Arab countries is the lowest globally.

³⁰ ILO, 2018.

³¹ ILO, 2018.

³² Aita, 2017a.

³³ SDSN, 2017.

II. SIZE AND ROLE OF SMES IN ARAB ECONOMIES

A. DEFINITION

SMEs are important to countries' economies, commanding large parts of markets; however, the definition of SMEs differs between countries. The definition is generally based on the number of employees (typically below 5 for micro, below 50 for small, and below 250 for medium enterprises). However, some Arab countries have adopted more complex criteria, like those adopted by the European Union (table 2).

Table 2. European Union definition of micro, small and medium enterprises

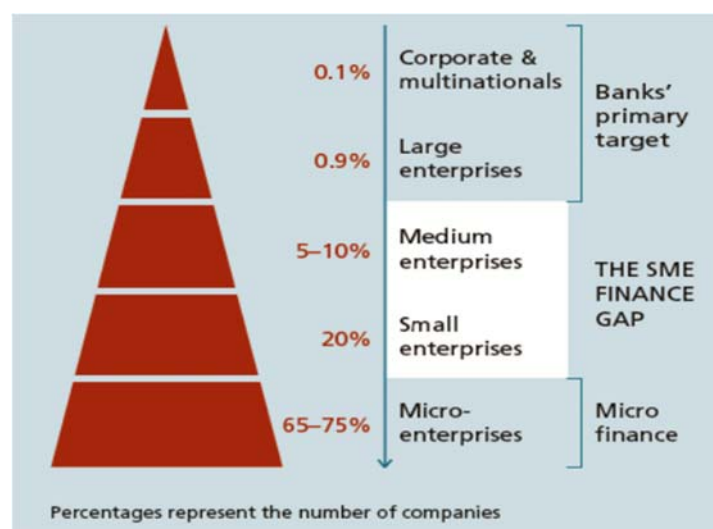
Enterprise category	Headcount	Turnover	Or	Balance sheet total
Medium	< 250	≤ EUR 50 million		≤ EUR 43 million
Small	< 50	≤ EUR 10 million		≤ EUR 10 million
Micro	< 10	≤ EUR 2 million		≤ EUR 2 million

Source: OECD, 2014.

B. MEASURING MICRO, SMALL AND MEDIUM ENTERPRISES

MSME numbers, size and contributions to the economy and employment can be measured directly using business register data or through specialized surveys. However, care should be taken when analysing and comparing MSME data in Arab countries. The challenge facing direct measurement is that most MSMEs in Arab countries are informal,³⁴ and thus not registered. Assessment by surveys is also problematic, as most Arab countries do not conduct systematic enterprise surveys. Efforts have been made in a few Arab countries in that regard, but they date back to 2004. The assessment could be derived indirectly from labour force surveys or from household income and expenditure surveys that are conducted more frequently in Arab countries, but this method is not systematic and does not adhere to international standards.

Figure 7. Typical business landscape in developing countries



Source: IFC, 2010, p. 11.

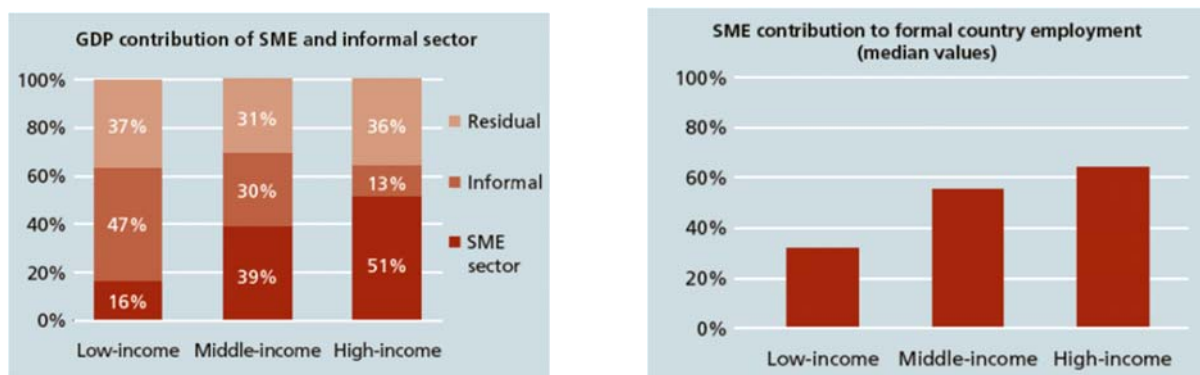
³⁴ The meaning of informality is different between employment and enterprises. The official definition of informal employment refers to the absence of social protection, mainly social security. The definition of informal enterprises relates to registration, particularly in the taxation system. The totality of informal enterprises forms the informal sector.

At the international level, the International Finance Corporation (IFC) of the World Bank has devoted some attention to MSMEs. A 2010 report indicates that in developing countries, between 65 per cent and 75 per cent of enterprises are micro enterprises, 20 per cent are small enterprises and 5-10 per cent are medium enterprises. Large enterprises constitute 0.9 per cent and multinationals comprise 1 per cent (figure 7).³⁵

The case of Egypt was depicted in the 2010 IFC report, based on the indicated 2004 enterprise survey. Although the report did not consider micro enterprises, it indicated that their number reached about 2.4 million. Among the 168,000 SMEs in Egypt, 53 per cent had 5-9 employees, 11 per cent had 10-14 employees, and 28 per cent had 15-49 employees. Medium enterprises (50-200 employees) represented 8 per cent of SMEs (the smallest market share). In this assessment, the small enterprises totalled the highest share of revenues (76 per cent), followed by those with 15-49 employees (28 per cent). Medium enterprises also totalled the smallest share of revenue at 2 per cent.³⁶

The analysis of MSMEs in the IFC report does not distinguish between those in the formal and informal sectors, addressing the issue in terms of GDP contributions. In the report, the informal sector (mostly MSMEs) was estimated to contribute half of the GDP in low-income countries and a third in middle-income countries (figure 8). It was also estimated that worldwide, SMEs contributed only 35 per cent of total formal employment in low-income countries, and half of formal employment in middle-income countries. In 2004, 68 per cent of SMEs in Egypt had bank deposit accounts, while only 8 per cent had bank loans.³⁷

Figure 8. Formal and informal SME contributions to GDP and employment globally



Source: IFC, 2010.

Another IFC report published in 2010 provides an overview of the spectrum of micro, small and medium enterprises around the world.³⁸ It introduces the concept of MSME density, meaning the number of formal MSMEs per 1,000 population. It counts 125 million formal (registered) MSMEs in the 132 economies studied, including 89 million in emerging markets. The Middle East and North Africa, which includes Iran and Turkey, accounts for 4.4 million formal MSMEs. The analysis of the collected data led IFC to conclude the following:

- Formal MSMEs are more common in higher income economies (higher density). In MENA countries, the median density is higher than that of East Asia and the Pacific, South Asia, Europe and Central Asia;
- MSME density rises at a faster pace in low and medium-income countries. The density rate of MENA came second after Europe and Central Asia;

³⁵ IFC, 2010.

³⁶ IFC, 2010, p. 11.

³⁷ IFC, 2004.

³⁸ Kushnir, K. and others, 2010.

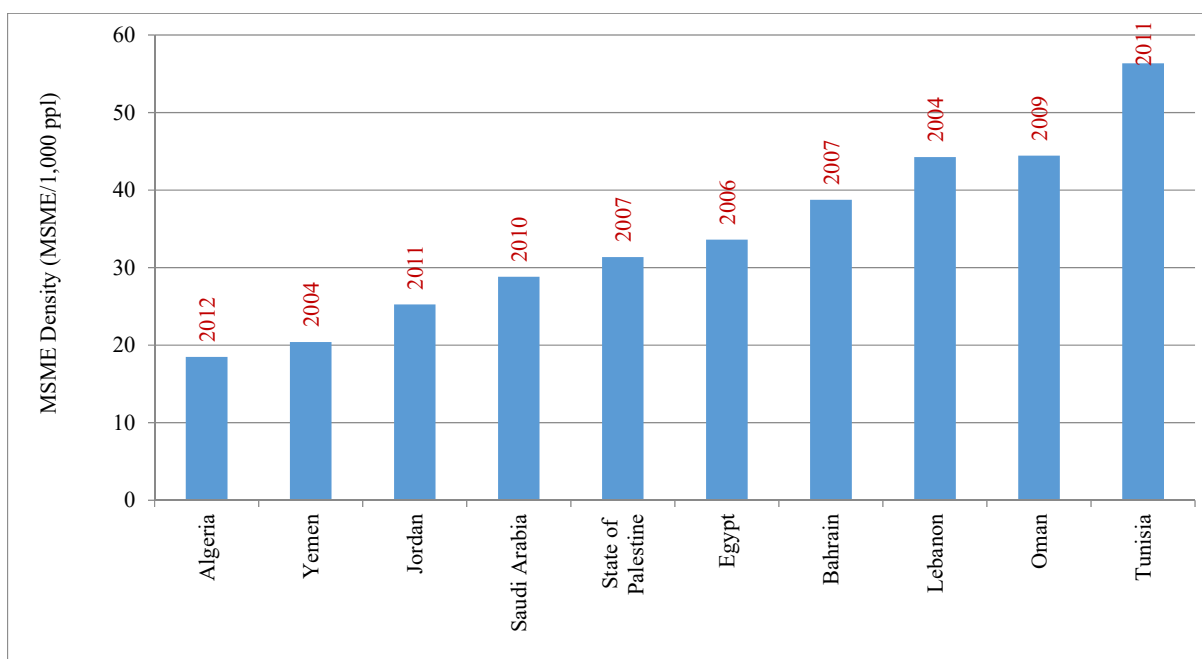
- A third of the countries covered define MSMEs as having up to 250 employees;
- Formal MSMEs employ over a third of world's labour force; but as income level drops, so does the percentage of MSMEs. In China, for example, MSMEs account for 80 per cent of total employment;
- Formal MSMEs identified access to finance as one of their biggest obstacles, between electricity and practices of the informal sector.

The IFC report also states that in economies with a higher percentage of firms with no formal credit, MSME density is lower,³⁹ while a larger informal sector is associated with lower formal MSME density. However, the question of informal MSMEs is addressed in the report's efforts on the concept of the "shadow economy".⁴⁰ While defining shadow economy activities is a thorny issue, a common working definition is all currently unregistered economic activities that contribute to a country's GNP.⁴¹ The shadow economy concept and its application to Arab countries will be discussed later in the present report.

C. MEASURING MSMEs IN ARAB COUNTRIES

An analysis of the data collected by IFC on formal MSME densities in Arab countries is shown in figure 9. Algeria has the lowest density at 18, and Tunisia the highest at 56. The density in Tunisia is far above the median value determined for MENA countries, and above that of some high-income OECD countries. This suggests that the calculated median value for Arab countries could be much higher than depicted in MSME country indicators.⁴² However, the years the data were collected varies greatly, between 2004 and 2012, which could impact the calculations.

Figure 9. Density of formal MSMEs in the Arab region



Source: Author's calculations, based on IFC database.

³⁹ Without clarifying if such density is for formal or total (formal and informal) MSMEs. It is expected that only formal MSMEs are meant.

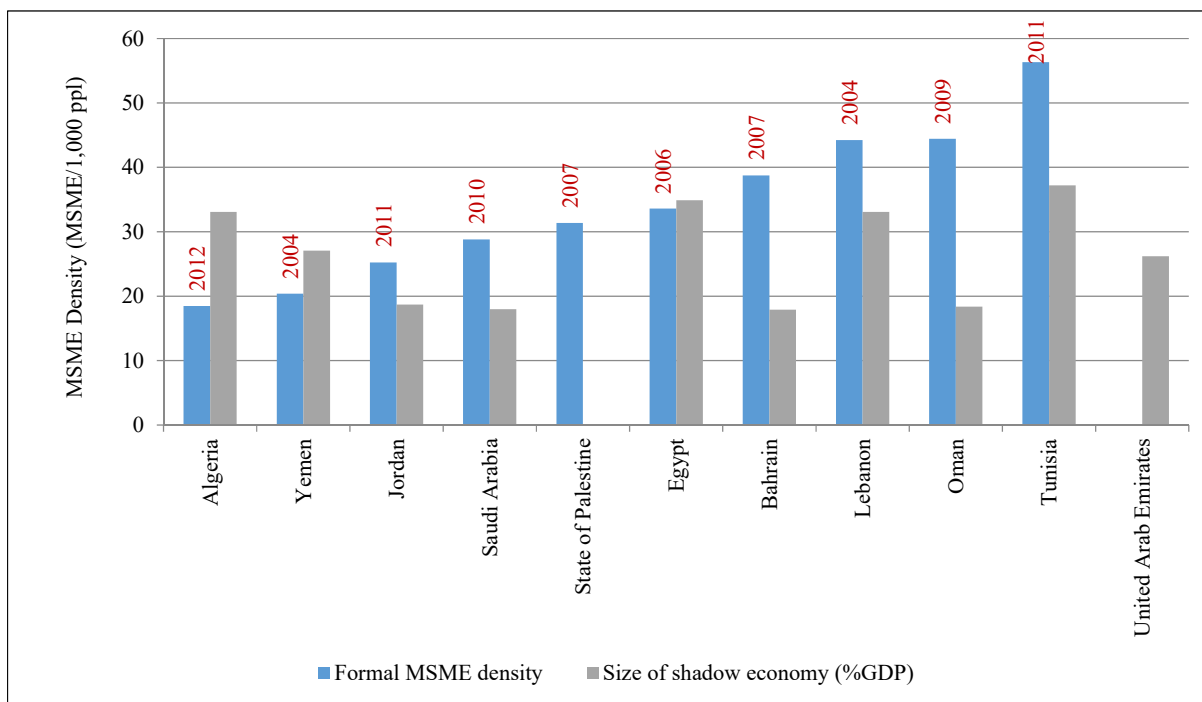
⁴⁰ Buehn and Schneider, 2009.

⁴¹ Friedrich Schneider, Andreas Buehn and Claudio E. Montenegro, "Shadow economies all over the world: new estimates for 162 countries from 1999 to 2007", Policy Research Working Paper, No. 5356 (Washington, D.C., World Bank, 2010) p. 4.

⁴² Kushnir, K. and others, 2010.

The correlation between MSME density and the size of the shadow economy in Arab countries was investigated (figure 10). The shadow economy is defined as enterprises that avoid taxes, social security registration or labour market regulations, or those avoiding being captured by administration, statistics and surveys. This is approximatively the ILO definition of the informal sector. The size of the shadow economy is defined as its share of a country's GDP and is assessed through a complex mathematical model⁴³ with numerous variables. Some of those variables are arguable in the context of Arab countries, such as the unemployment rate.

Figure 10. Density of formal MSMEs and the shadow economy in the Arab region



Source: Author's calculations, based on IFC database.

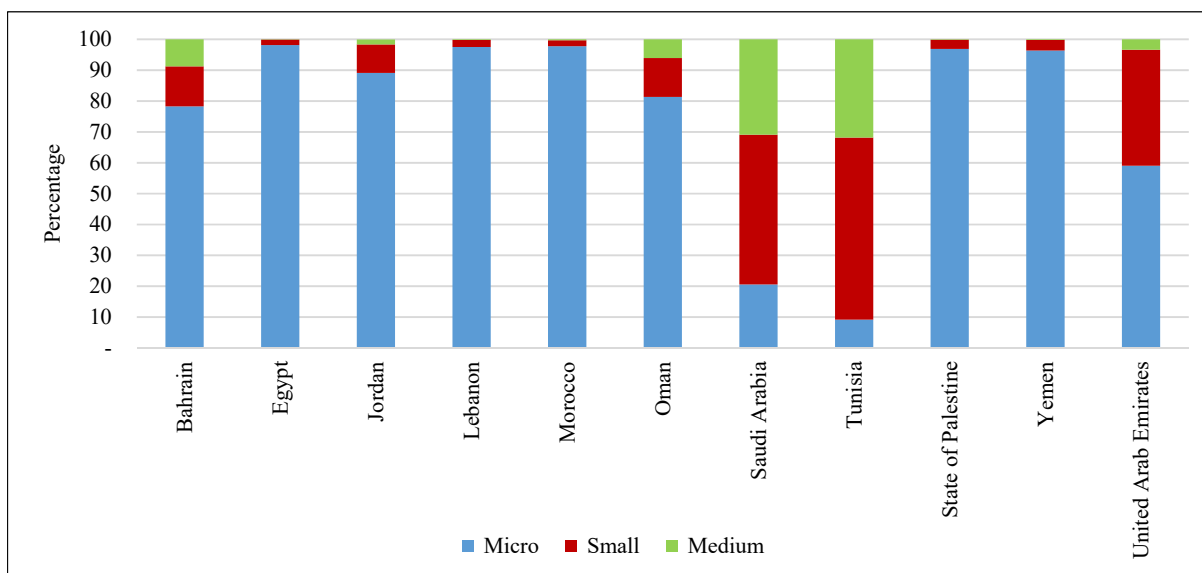
The large share of informal employment (even outside agriculture), the absence of unemployment compensation schemes and large variations in the labour force owing to accelerated rural-urban migration and to the use of a foreign labour force make the use of the unemployment rate as a variable questionable for Arab countries.⁴⁴ However, the correlation between the shadow economy and MSME density data in figure 10 does not indicate a clear relationship between the percentage of formal MSMEs and shadow economy in the Arab countries.

The breakdown of MSMEs is provided in the IFC database for a fewer number of Arab countries (figure 11). The data seems consistent with the general international situation (that the number of formal micro enterprises should be the largest), except for Saudi Arabia and Tunisia. However, the distribution between small and medium enterprises seems inconsistent in almost all cases: the number of formal medium enterprises is similar to that of formal small enterprises in some cases, but almost absent in other cases. These inconsistencies raise questions related to whether a medium enterprise (between 50 and 250 employees) can be informal, and the impact on data if informal enterprises are included.

⁴³ Buehn and Schneider, 2009.

⁴⁴ Aita, 2017b.

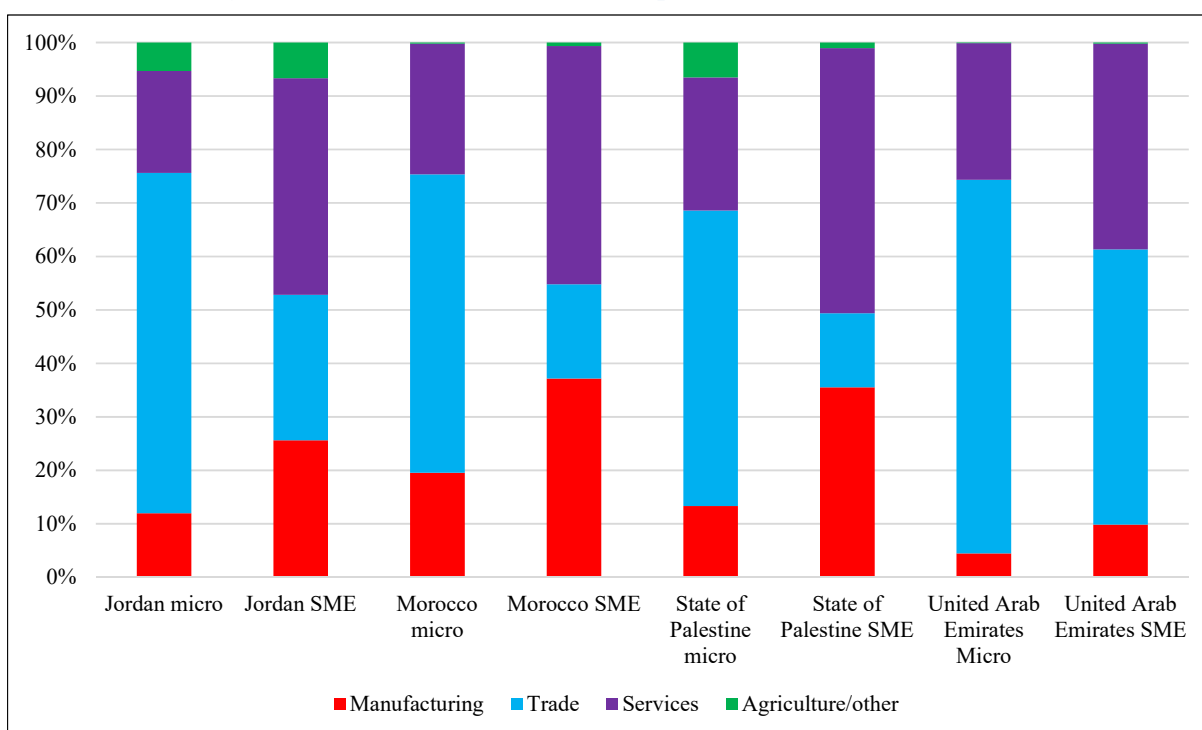
Figure 11. Percentage of formal MSMEs in selected Arab countries



Source: Author's calculations, based on IFC database.

The distribution of formal MSMEs across economic sectors is provided in figure 12. The distribution of data is consistent: most formal MSMEs are in trade and services. The relative distribution between manufacturing, trade and services could be a specific characteristic of each country economy.

Figure 12. Distribution of micro enterprises and SMEs across sectors



Source: Author's calculations, based on IFC database.

D. MSMEs AND LABOUR FORCE SURVEYS

The consistency of MSME data can also be checked through labour force surveys (LFS). Even if such surveys in Arab countries are not up to international standards,⁴⁵ the order of magnitude of micro enterprises (formal and informal) should be like own-account workers, a category of labour relation. The total number of SMEs should be like that of employers, another category of labour relation.

The results of the comparison between MSME data in the IFC database⁴⁶ and labour force survey data is shown in table 3. The results of a recent Tunisian report⁴⁷ analysing MSMEs through official registries (thus formal) are also shown for comparison.

Table 3. Comparison between MSMEs and labour force survey data for selected Arab countries

Countries	Formal micro	Own account	Formal SMEs	Employers	Total formal MSMEs	Own account and employers
Algeria	--	2 649 000	--	424 000	624 478	3 073 000
Bahrain	14 667	24 000	4 070	32 000	18 737	56 000
Egypt	2 404 995	2 635 900	45 701	2 635 900	2 450 696	5 271 800
Jordan	130 516	102 000	15 837	54 000	146 443	156 000
Lebanon	13 749	464 000	353	111 000	14 102	575 000
Morocco	733 662	3 079 000	16 540	278 000	750 202	3 357 000
Sudan	--	2 864 000	--	414 000	22 460	3 278 000
Tunisia	533	591 499	5 288	248 387	5 821	839 886
Tunisia ^a	692 186	591 668	19 256	248 459	711 442	840 127
State of Palestine	99 472	170 856	3 139	57 856	102 611	228 712
Yemen	385 827	1 300 000	14 408	236 000	400 235	1 536 000

Sources: Kushnir and others, 2010; Aita, 2017.

Note: ^a Data in this row are based on data from a report published by Statistiques Tunisie (2017).

The comparison seems consistent in Bahrain for micro enterprises. They are of the magnitude of own-account workers, but less in number as the latter includes both formal and informal enterprises. However, the number of employers is much larger than that of formal SMEs, although one would expect that most enterprises in Bahrain would be formal. In Egypt, the comparison shows the opposite of Bahrain. There are only 45,705 formal SMEs, while the country accounts for 2.6 million employers. One can expect informality to be very large in Egypt. The case of Tunisia, where informality is low, shows the inconsistencies in a clearer way. The numbers of formal MSMEs, as reported by IFC, are low compared with LFS data and with registration data reported by the official Tunisian statistical office.

The results of the comparison show that significant inconsistencies exist in data on MSMEs in Arab countries, thus impeding meaningful analyses to deduce detailed perspectives on the use of innovation to foster MSMEs in the light of the SDGs. This is a challenge that United Nations agencies, Governments and civil

⁴⁵ ILO, 2013.

⁴⁶ <https://finances.worldbank.org/Other/IFC-Enterprise-Finance-Gap-Database-Raw-Data/2ppx-k958>.

⁴⁷ Statistiques Tunisie, 2017.

society should highlight. There is a need to enhance the activities of national statistical offices in Arab countries so that they regularly carry out the following in line with international standards:

- Enterprise surveys, especially MSMEs;⁴⁸
- Labour force surveys;
- Household income and expenditure surveys.

Those surveys should be systematically analysed and compared to obtain consistent data that describe the MSME environment in a country, its contribution to different sub-sectors of the economy and of employment, and distinguish between formal and informal enterprises. Analysis of registration records is useful but not sufficient, as they do not cover informal enterprises.

III. SME ENVIRONMENT AND INNOVATION

Despite difficulties in measuring the numbers and contributions of SMEs to the economy, it is useful to assess government policies towards SMEs, especially for fostering their development through innovation. This policy environment can be analysed qualitatively through different indicators. The SME Policy Index is a benchmarking tool that is designed to assess SME policy frameworks in emerging economies and to monitor progress in policy implementation over time. The Index was developed in 2006 by OECD in partnership with the European Commission, the European Bank for Reconstruction and Development and the European Training Foundation.⁴⁹

The SME Policy Index assesses 10 policy dimensions, derived from the Small Business Act of the European Union,⁵⁰ the analysis of which constitutes the following assessment framework:

- Create an environment in which entrepreneurs and family businesses can thrive, and entrepreneurship is rewarded;
- Ensure that honest (non-fraudulent) entrepreneurs who have faced bankruptcy quickly get a second chance;
- Design rules according to the “think small first” principle;⁵¹
- Make public administrations responsive to SME needs;
- Adapt public policy tools to SME needs: facilitate SME participation in public procurement and make better use of available government aid for SMEs;
- Facilitate SME access to finance and develop a legal and business environment supportive to timely payments in commercial transactions;
- Help SMEs to benefit more from opportunities offered by the single market;
- Promote the upgrading of skills in SMEs and all forms of innovation;
- Enable SMEs to turn environmental challenges into opportunities;
- Encourage and support SMEs to benefit from market growth.

⁴⁸ See, for example, <http://www.enterprisesurveys.org/methodology>.

⁴⁹ More information on the SME Policy Index is available at <https://www.oecd.org/globalrelations/smallandmedium-sizedenterprisessmepolicyindex.htm>.

⁵⁰ OECD and others, 2014.

⁵¹ The “think small first” principle consists of considering the needs and characteristics of SMEs when designing legislation. It also promotes the simplification of the regulatory environment.

The eighth dimension mentioned above is composed of two sub-dimensions: 8.1: Enterprise skills, and 8.2: Policy framework for SME innovation. The sub-dimension 8.2 has 10 indicators (table 4). Each indicator is a noted function of progress in defining and implementing relevant innovation policy for SMEs.

Table 4. SME Policy Index dimension 8: Enterprise skills and innovation

Sub-dimension 8.1: Enterprise skills		Sub-dimension 8.2: Policy framework for SME innovation	
8.1.1	Training needs analysis	8.2.1	Delegation of competencies and tasks
8.1.2	Availability of training	8.2.2	Strategic approach to innovation policy for SMEs
8.1.3	Start-up training	8.2.3	Budget provision for SME innovation
8.1.4	Enterprise training	8.2.4	Establishment of innovation and technology centres
8.1.5	Enterprise growth	8.2.5	Information on innovation support services
8.1.6	Access to international markets	8.2.6	Financial support services
8.1.7	Quality Assurance	8.2.7	Tools used to support cooperation between SMEs and research institutes/universities
8.1.8	Skills for sustainable enterprise development	8.2.8	Public research and development grants
		8.2.9	Incubators (serving innovative start-ups which are linked to technology content)
		8.2.10	Science parks/competitive clusters and facilities to promote networking among companies.

Source: OECD and others, 2014.

In 2008 and 2013, the OECD and its partners devoted assessed SME policy frameworks in seven Arab countries,⁵² namely Algeria, Egypt, Jordan, Lebanon, Morocco, the State of Palestine and Tunisia. The results of the assessment of the policy framework for SME Innovation for 2008 and 2013 using weighted scores are shown in figure 13.

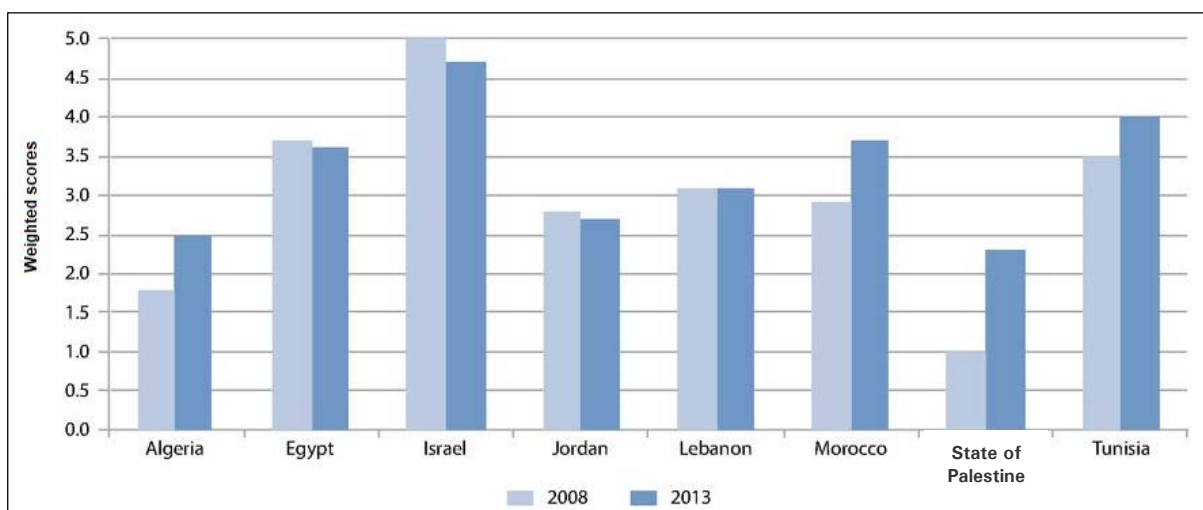
The following are the key findings of those reports for MENA countries:

- In 2008, innovation was relatively weak across all countries. Egypt and Tunisia were the only countries that had put policy instruments in place, including technology centres and science and/or technology parks. All other countries only had pilot stage projects in place;
- In 2013, countries progressed in the development of innovation policy frameworks, with the promotion of innovative enterprises as an SME policy objective. In 2013, all countries, except Algeria and the State of Palestine, had or were developing innovation strategies that included SMEs.⁵³

⁵² The assessment also included Israel.

⁵³ OECD and others, 2014, p. 38.

Figure 13. SME innovation in selected MENA countries



Source: OECD and others, 2014, p. 159.

Notes: For comparability purposes, the indicators for 2008 were rearranged to correspond to the framework in 2013.

Figure 13 shows that four Arab countries made progress in 2013 compared with 2008, namely Algeria, Morocco, the State of Palestine and Tunisia. Lebanon kept the same score, while Egypt and Jordan had a lower score in 2013 compared with 2008.

The detailed scores of the 10 indicators of sub-dimension 8.2 are shown in table 5. Lebanon and Morocco rank well in the indicator related to “delegation of competencies and tasks” (indicator 8.2.1). Morocco and the State of Palestine made considerable progress in the definition of a strategic approach to innovation policy for SMEs (indicator 8.2.2), while Jordan had the highest score in budget provisioning for SME innovation (indicator 8.2.3). The State of Palestine achieved the most significant advancement in the establishment of innovation and technology centres (8.2.4). Morocco led in informing on information support services (8.2.5), and Algeria made the most significant progress in financial support services for SMEs (8.2.6). The State of Palestine and Tunisia have the most advanced tools used to support cooperation between SMEs and research institutes and universities (8.2.7). Algeria and Tunisia have the highest research and development grants (8.2.8). Lebanon, Morocco, the State of Palestine and Tunisia have incubators serving innovative startups linked to technology content (8.2.9), while Tunisia also distinguishes itself by its science parks, competitive clusters and facilities to promote networking among companies (8.2.10).⁵⁴

The OECD study recommends the following priority actions for countries:

- Although countries have taken steps to improve policy frameworks and increased services for SMEs, they need to develop complete frameworks to support innovation, especially SMEs;
- Countries should create a body, chaired by a high political authority and supported by a structured secretariat, to coordinate innovation so as to ensure change and consultation with stakeholders;
- Measures to monitor and evaluate the promotion of innovation should be implemented to determine the impact of activities and aid in the identification of future priorities, including the improvement of data collection and follow-up;
- SMEs should be better informed about financial and non-financial services provided by the Government, non-governmental organizations, associations and private organizations. A possible

⁵⁴ OECD and others, 2014, p. 160.

tool would be an interactive and centralized online database where all public and private service providers can promote their services;

- Support should be given for the creation and growth of networks and clusters that can introduce SMEs to new technologies, products and processes, and provide access to advance services and technical laboratories. Both national and international networks and programmes should be included to create transfer among SMEs.⁵⁵

Table 5. Indicators of sub-dimension 8.2: Policy framework for SME innovation in MENA countries

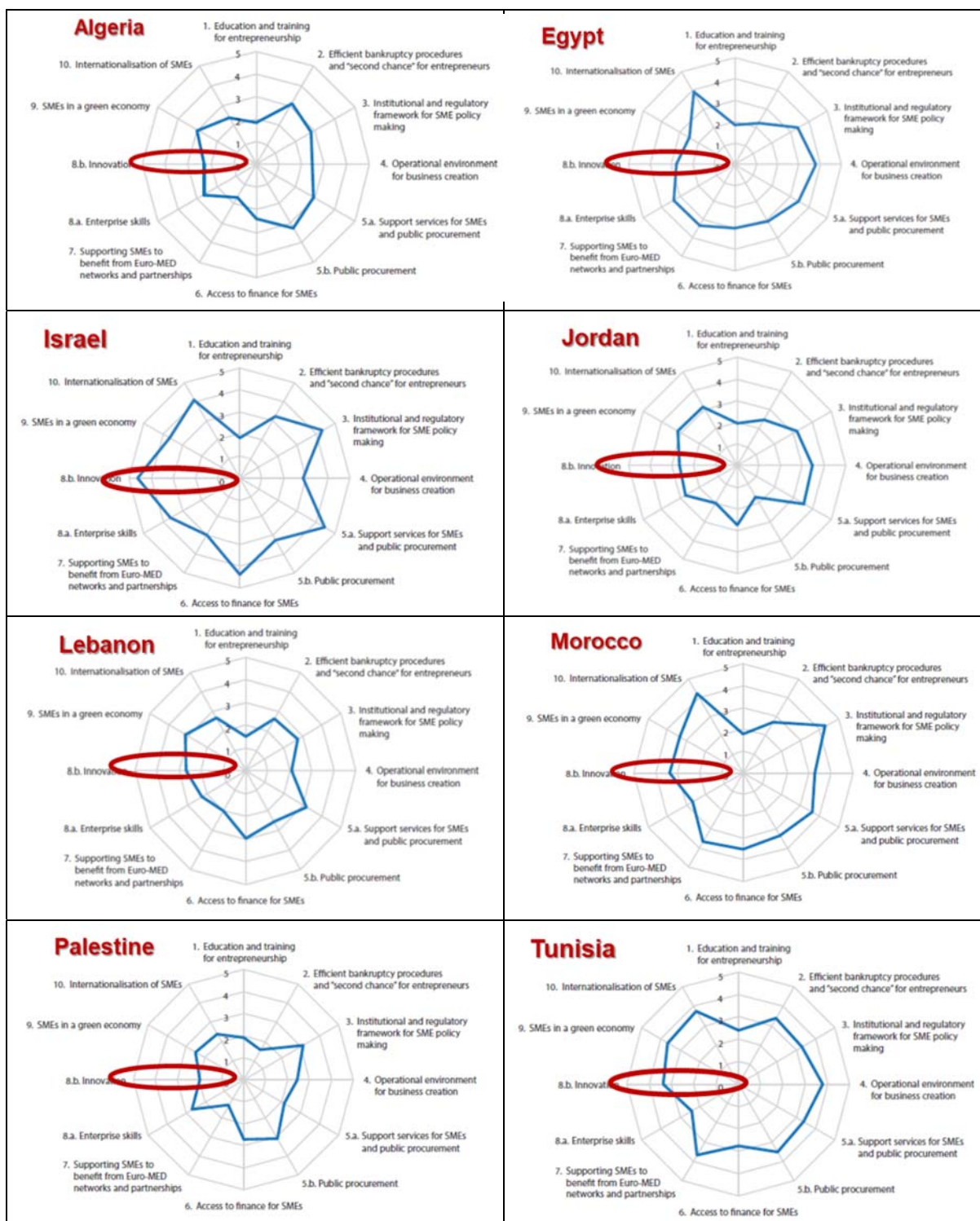
Indicators		Year	Algeria	Egypt	Israel	Jordan	Lebanon	Morocco	State of Palestine	Tunisia
8.2.1	Delegation of competencies and tasks	2013	2	2	5	2.5	3.5	3.5	1.5	3
8.2.2	Strategic approach to innovation policy for SMEs	2013	2.5	3.5	4.5	2.5	3	4	2	4
		Change since 2008	+0.5	0	-0.5	0.0	0.0	+1.0	+1.0	+0.5
8.2.3	Budget provision for SME innovation	2013	2	2.5	4.5	3.0	1.5	3	2	3
8.2.4	Establishment of innovation and technology centres	2013	2	4.5	5	3	3	3.5	2.5	4
		Change since 2008	+0.5	+0.5	0.0	0.0	0.0	+0.5	+1.5	+0.5
8.2.5	Information on innovation support services	2013	2	2	4.5	2.5	2	4.0	1	3
8.2.6	Financial support services	2013	3	3	5	3	3.5	3	3	4
		Change since 2008	+1.5	-1.0	0.0	-0.5	0.0	+0.5	+2.0	+0.5
8.2.7	Tools used to support cooperation between SMEs and research institutes/universities	2013	2.5	2.5	4.5	3	3.0	2.5	3.0	3.0
8.2.8	Public research and development grants	2013	3.0	2.5	4.5	2	2.0	2.5	1.0	3.0
8.2.9	Incubators (serving innovative start-ups which are linked to technology content)	2013	2.0	3	5.0	3	3.5	3.5	3.5	3.5
8.2.10	Science parks/competitive clusters and facilities to promote networking among companies.	2013	2.0	2.5	4.0	2.5	2.5	2.5	1.5	3.0
Weighted average			2.3	2.8	4.6	2.7	2.7	3.4	2.0	3.4

Source: OECD and others, 2014, p. 160.

Figure 14 shows the results of the studied countries in the various dimensions and subdimensions of the SME Policy Index. The diagrams show that the innovation dimension (8.b) is lower than other dimensions in Algeria, Egypt, Jordan and the State of Palestine. The subdimension of “Education and training for entrepreneurship” is also low, although it is essential for innovation in society.

⁵⁵ OECD and others, 2014, p. 39.

Figure 14. General scores of the SME Policy Index of Arab countries



Source: OECD and others, 2014.

IV. FOSTERING INNOVATION IN MSMEs

The previous chapters showed that most Arab countries still lack knowledge on the size and status of MSMEs, their environment and their contribution to employment, to the economy and to producing added value for a country. Arab countries need to build a comprehensive policy framework to foster innovation and to develop MSMEs, given that they are essential for promoting productivity, competitiveness and job creation.

Arab countries that have started formulating innovation strategies and implementation frameworks face difficulties in that those strategies only address some economic sectors, mostly technology startups. Strategies do not consider the broader impact of innovation on all economic sectors, especially on those where production is carried out by formal or informal MSMEs.

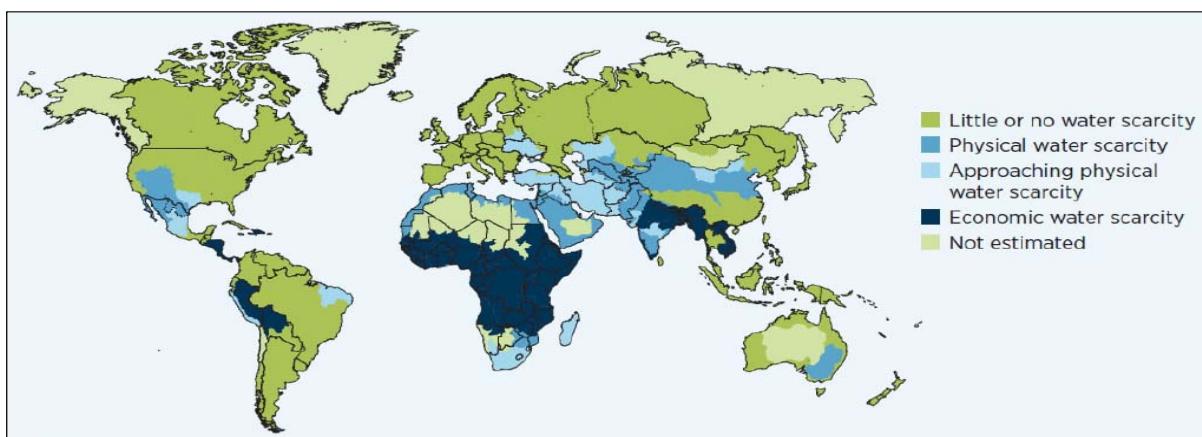
Arab countries need to leapfrog various levels to reach acceptable social and economic levels, compared with other similar economies. Leapfrogging could be achieved through innovation in MSMEs, policies and the continuous improvement of strategies, taking into consideration the experiences of other countries.

ESCWA has proposed a framework on innovation policy for Arab countries,⁵⁶ which considers the level of innovation in Arab countries⁵⁷ and the social and economic challenges faced by Arab countries, especially in achieving the SDGs. One of the study's aims is to add another perspective to the ESCWA framework by focusing on the role of innovation in enhancing MSMEs in both rural and urban areas. Experiences of developing and developed countries show that there is a need to differentiate between innovation requirement and its ecosystem in rural and urban areas. Government and international institutions that encourage and promote innovation should vary and adapt approaches to accommodate local specificities.

A. INNOVATION IN RURAL AREAS, WITH A FOCUS ON AGRICULTURE AND FOOD

Agriculture is the most important economic activity in rural areas, and the major contributor to employment in many countries. It is also the main sector for water consumption and has been weakened by inadequate water management, thus contributing to accelerated rural-urban migration. All Arab countries face critical water scarcity (figure 15) and food security. It is therefore crucial for them to pay special attention to the agriculture sector, including innovation and MSME policies in the sector.

Figure 15. Global physical and economic water scarcity around the world



Source: UNCTAD, 2017.

Note: Most Arab countries fall into the category “approaching physical water scarcity”, which means more than 60 per cent of river flows are withdrawn and that basins will experience physical water scarcity in the near future.

⁵⁶ ESCWA, 2017b.

⁵⁷ ESCWA, 2017a.

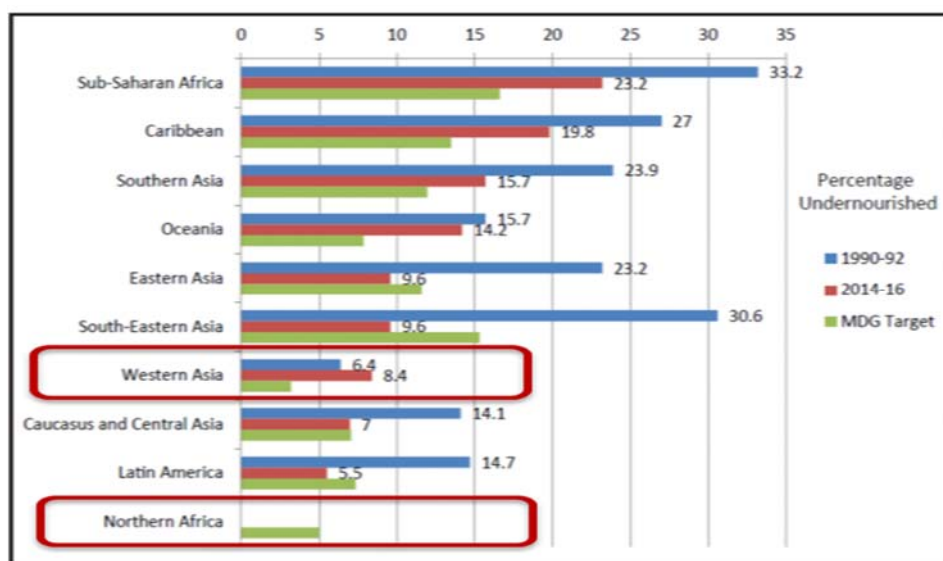
UNCTAD has addressed the role of technology in enhancing MSMEs in the agriculture sector.⁵⁸ It observes that most producers in agriculture are MSMEs, and that the sector is still largely dominated by traditional family enterprises. To address water scarcity, climate change and food insecurity, UNCTAD stresses the need to enhance the productivity and income of smallholder family farmers, and improve investment and social protection in the face of globalization and liberalization. The UNCTAD study shows that undernourishment increased in Arab countries in previous decades, even though its reduction was a Millennium Development Goal (figure 16).

Consequently, UNCTAD has developed a methodology for the formulation of innovation policies in agriculture, based on the following four dimensions of food security:

- *Food availability*: aimed at improving agriculture productivity; for example, introducing new technologies of cross breeding, soil management and irrigation;
- *Food access*: aimed at improved access to food by minimizing food losses and improving storage methodologies and the transportation and usage of waste;
- *Food stability*: aimed at combating food insecurity by introducing climate change adaptation technologies, big data and the Internet of things for precision agriculture and early warning systems;
- *Food use and utilization*: aimed at changing nutrition and introducing new consumption habits.

Most of the above-mentioned innovations are already available in the market; however, new technologies are emerging and need to be employed to enhance the agriculture sector, such as synthetic biology, artificial intelligence, tissue engineering, three-dimensional printing, drones and robotics. The full potential of those technologies has not yet been explored, thus providing opportunities for MSMEs and industry. UNCTAD proposes an agriculture innovation system (figure 17) for inclusion in countries' innovation strategies. Such a framework is suitable for Arab countries, and could be adopted to enhance and boost the agriculture sector.

Figure 16. Percentage of undernourished across the world

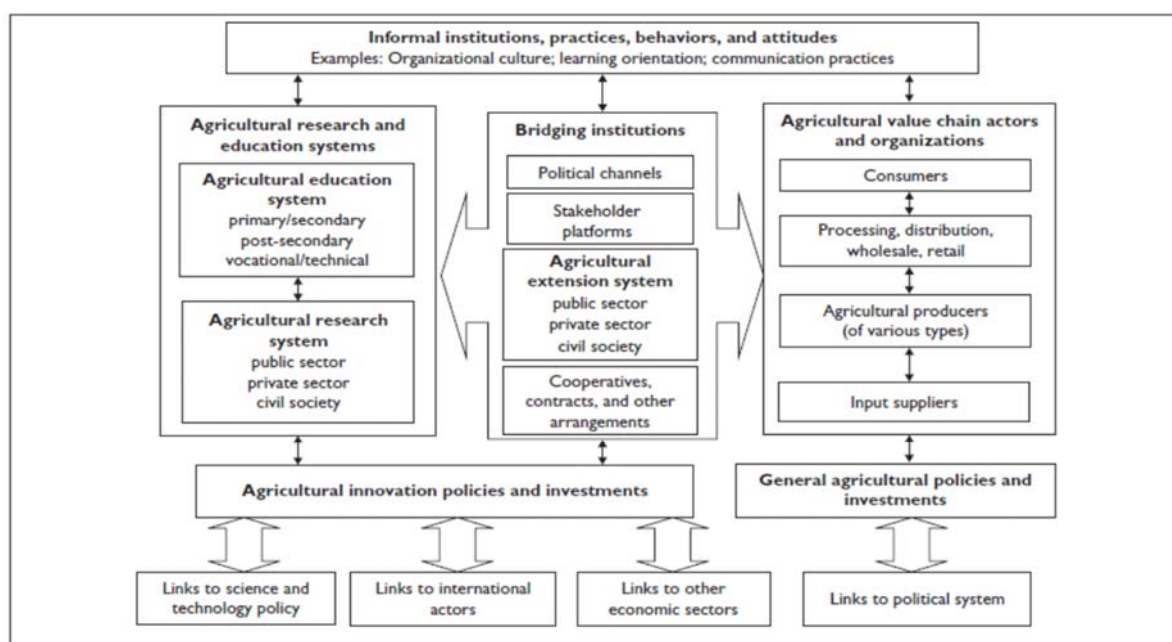


Source: UNCTAD, 2017.

Note: Western Asia includes Bahrain, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, the Syrian Arab Republic, Turkey, the United Arab Emirates and Yemen.

⁵⁸ UNCTAD, 2017.

Figure 17. UNCTAD agriculture innovation system



Source: UNCTAD, 2017.

B. INNOVATION AND NETWORKING IN URBAN AREAS

For decades, it was a trend to create technology parks in city suburbs, dedicated to innovation and startups. They concentrated their activities on technological innovation, creativity and the creation of startups using venture capital. The trend is now changing as cities become hubs for technological innovation.⁵⁹ In the United States of America, cities like San Francisco, New York and Boston are competing with Silicon Valley (San Jose) to attract venture capital.⁶⁰ This trend also applies to smaller cities, especially those that host good universities (figure 18), such as Boulder (University of Colorado), Ann Arbor (University of Michigan), Lawrence (University of Kansas) and Austin (University of Texas).⁶¹

There are many factors that reflect innovation activities in a country; the most relevant is venture capital investments, which correlate with the number of patents registered and thus with the concentration of high-tech industries, income and wage levels, and the percentage of adults holding a university degree and those holding knowledge-work jobs (the creative class).⁶² Venture capital investment correlates well with business and management occupations and with arts, media and entertainment occupations (concerning good management and good design). It also correlates positively with liberal political orientations and negatively with conservative ones. This might relate to the positive correlation with diversity and openness, and with the share of adults who are foreign born. Immigrants make up a considerable share of the founders of high-tech startups in many countries.⁶³ All the above factors are characteristics of dense urban environments with high concentration of MSMEs. They also apply to some cities in Arab countries, such as Dubai and Beirut.

⁵⁹ Mulas and other, 2015.

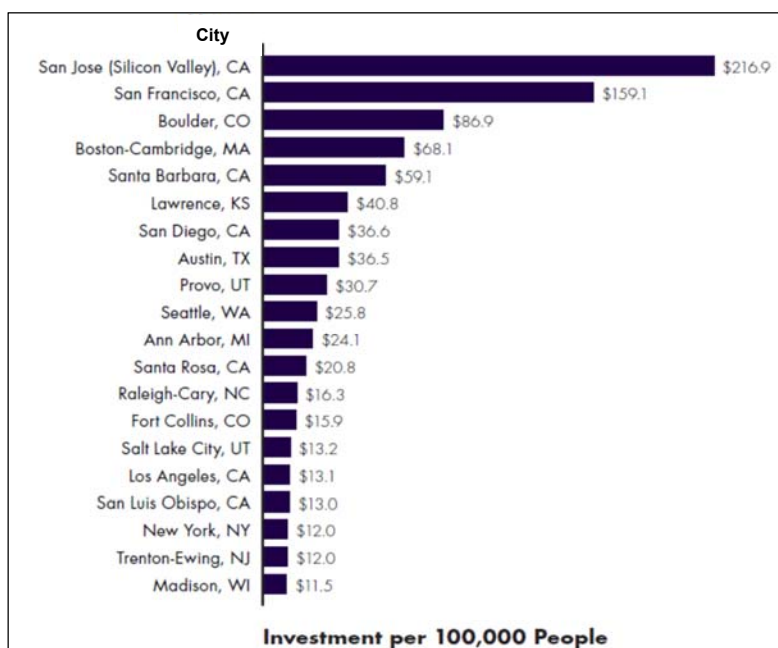
⁶⁰ Florida, 2014b.

⁶¹ Florida, 2014b.

⁶² Florida, 2014a.

⁶³ Florida, 2014b.

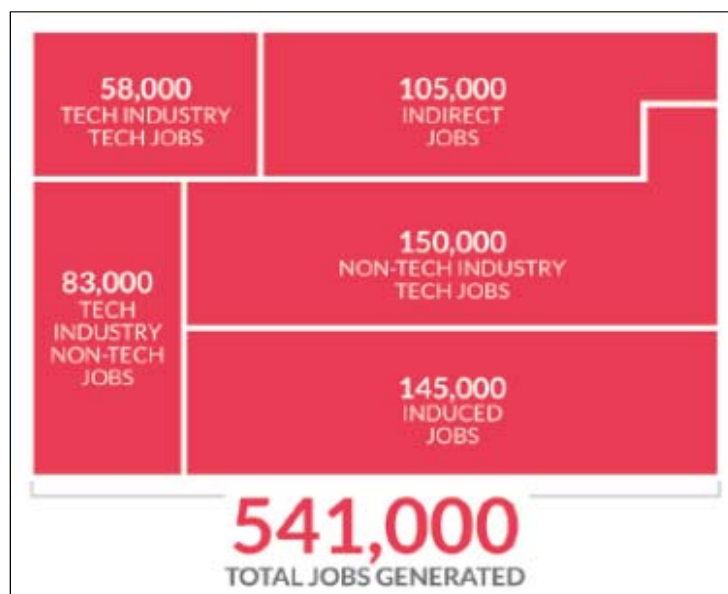
Figure 18. Top 20 United States cities for venture capital investment per capita



Source: Florida, 2014b.

Transferring the creation of startups from suburbs to cities has become a global trend. One of the main implications of this is the contribution to economic development and job creation, not only for technology employment but also for non-tech jobs. A World Bank study notes that the total number of jobs created by startups is almost ten times higher than direct tech-jobs (figure 19).⁶⁴

Figure 19. Technology employment and impact in New York City, 2003-2013

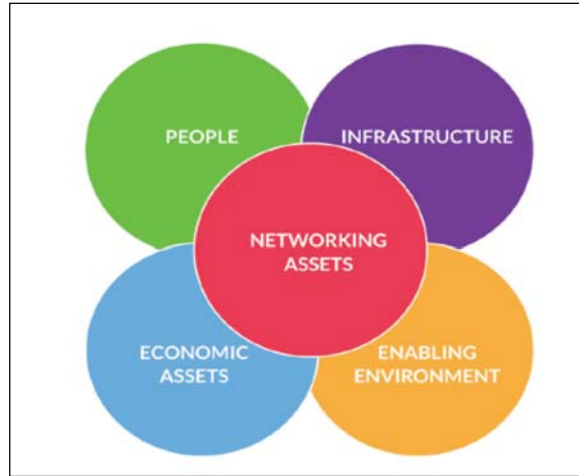


Source: Mulas and others, 2015, p. 11.

⁶⁴ Mulas and others, 2015.

The World Bank has established a framework for cities' innovation ecosystems. It acknowledges that innovation concerns both products and processes,⁶⁵ and that the innovation ecosystem consists of economic agents and economic relations as well as the non-economic parts such as technology, institutions, sociological interactions and the culture,⁶⁶ and a synergetic relationship between people, firms and place that facilitate idea generation and accelerates commercialization.⁶⁷ This framework highlights networking as a central asset connecting the other elements of the ecosystem (figure 20).

Figure 20. City innovation ecosystem framework



Source: Mulas and others, 2015, p. 19.

Networking acts as a multiplier of the other factors that can boost the size and rate of growth of the ecosystem. As creator and promotor of communities, networking increases the number of “collisions” (figure 21) that result in innovation within cities. This gives a special insight on the notion of clusters for innovation showing they are linked to the social dimension rather than a geographical dimension.

Figure 21. Collision activities



Source: Mulas and others, 2015, p. 18.

⁶⁵ Mulas and others, 2015.

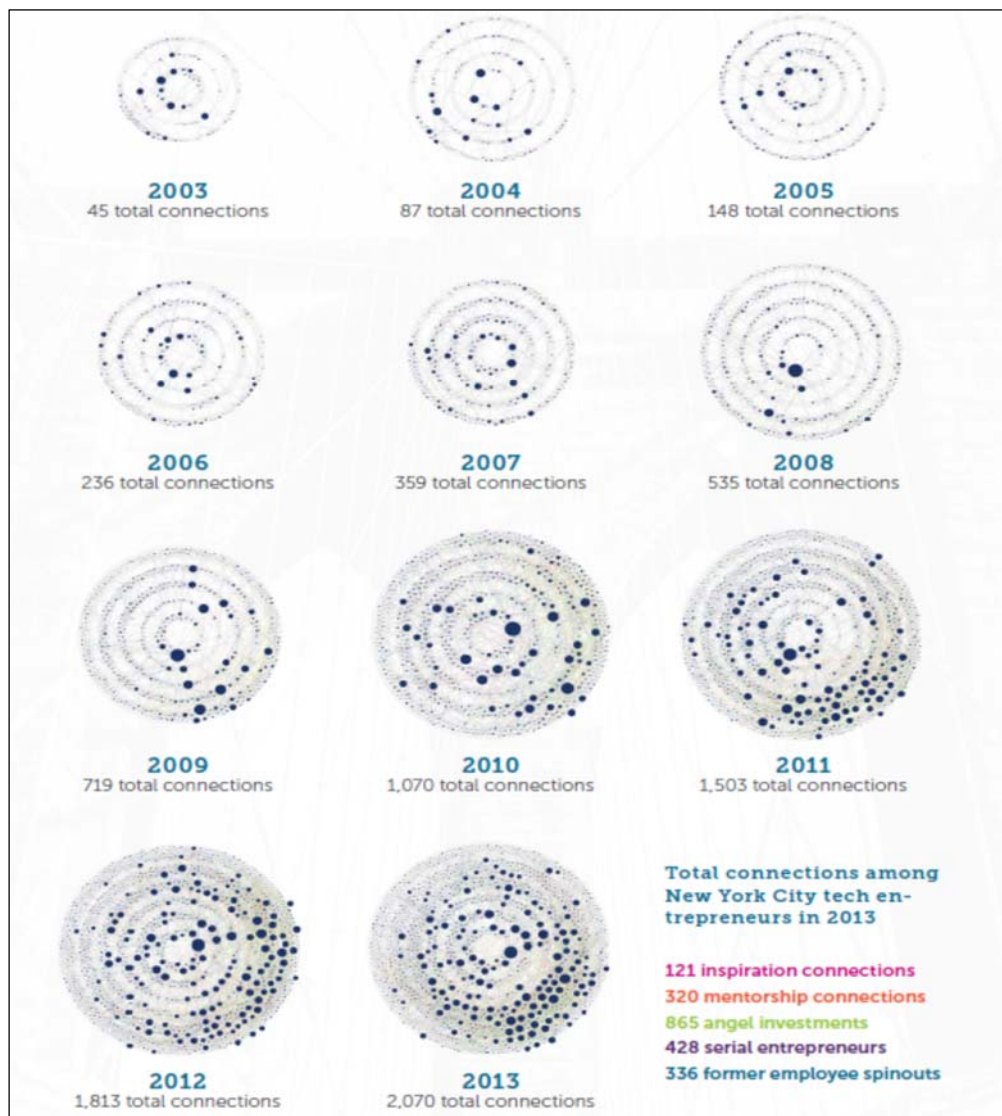
⁶⁶ Mercan and Göktaş, 2011.

⁶⁷ Katz and Wagner, 2014.

The coalescence of many companies gives the perspective of how the New York technology sector has grown over the period 2003-2013 (figure 23), and illustrates the importance of connections within tech companies' ecosystem.

The application of this analysis to other cities, such as Santiago,⁶⁹ Medellin (figure 24),⁷⁰ Cairo and Beirut (figure 25), shows that networking is organized around a limited number of focal tech companies that play the role of accelerators of growth. This is best demonstrated in the comparison between Medellin and Cairo. In the latter case, all networks are densely organized around a unique focal tech company or group of people.

Figure 23. Growth of New York City's tech sector, 2003-2013



Source: Endeavor Insight, 2014, p. 19.

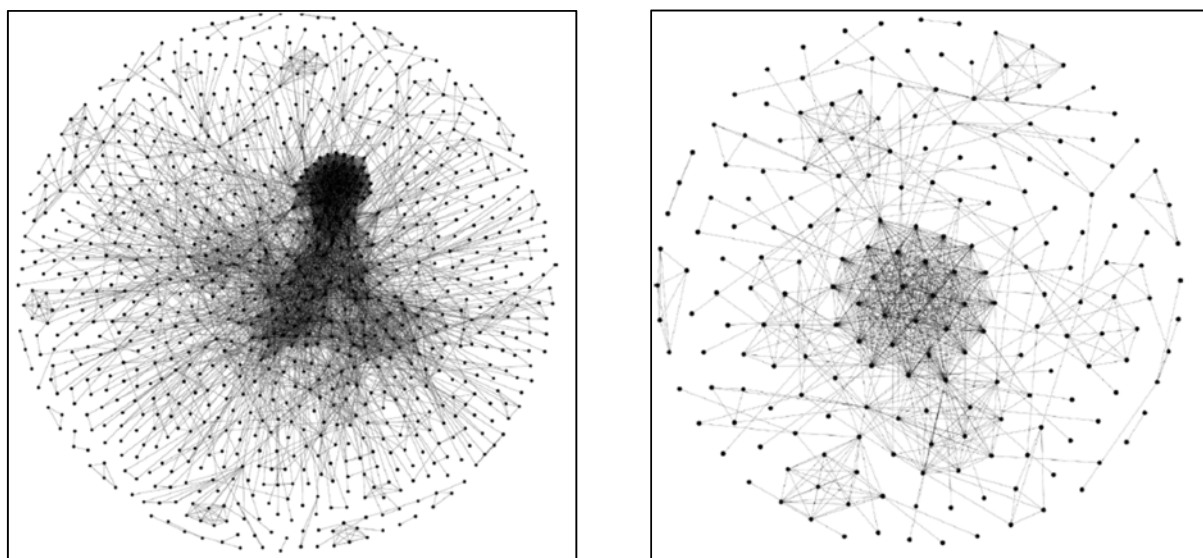
Note: The New York network is shown in its dynamic dimension over time.

⁶⁹ Endeavor Insight, 2016.

⁷⁰ Mulas and others, 2017, p. 18.

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Figure 25. Map of the tech sector network in Cairo (left) and Beirut (right)



Source: Mulas and others, 2017.

The example of Beirut shows that the network is still in its infancy. However, the application by the World Bank of this method of analysis to the case of Beirut shows some of its deficiencies. Figure 26 indicates the connectivity vision derived for Beirut's technology ecosystem. The Central Bank (BDL accelerate), the University of Pennsylvania and Startup Weekend appear to be the focal points of the network. The Central Bank of Lebanon injected \$400 million into the Lebanese enterprise market as guarantees for bank investments in the knowledge economy. This strong initiative has boosted the SME sector, but mostly at the level of the economic dimension of the ecosystem (figure 20) and not really on connectivity. In addition, the University of Pennsylvania and Startup Weekend are two networks for entrepreneurship linking the Lebanese with the outside world, but they are not the only ones. There are many other initiatives contributing to Beirut tech ecosystems, such as UK-Lebanon Tech Hub,⁷¹ Lebanese Canadian Tech Hub LCTechHub,⁷² Altcity Bootcamp⁷³ and Speed at BDDk,⁷⁴ which act as accelerators, including Berytech⁷⁵ (the first incubator and accelerator) and the Beirut Digital District facility.⁷⁶

More importantly, the framework of putting connectivity as a central asset for innovation and SME ecosystem raises several questions concerning its use for analysis and for deriving policies. Firstly, it does not concern only tech start-ups and SMEs, but also all the environment around them. One of the main aspects of the first application of connectivity in the case of New York City was to show how cities create ecosystems facilitating the acceleration of technology growth for SMEs comparatively to technological parks. In turn, tech startups and SMEs boost development and employment in cities beyond the tech sector. These crucial interactions between tech startups and the other economic and environmental fields are one of the most significant values in the use of connectivity.

⁷¹ More information is available at <https://www.uklebhub.com/>.

⁷² More information is available at <https://lctechhub.org/>.

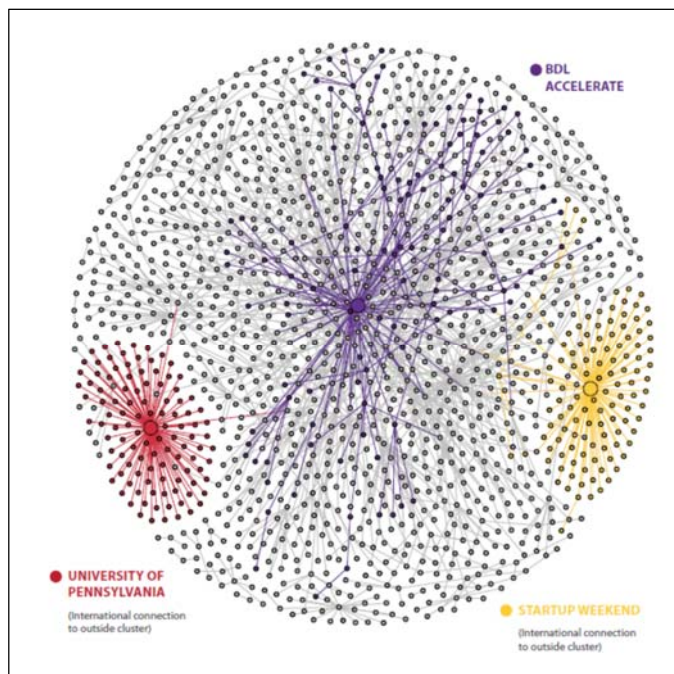
⁷³ More information is available at <http://www.bootcamp-lb.com/>.

⁷⁴ More information is available at <http://speedlebanon.com/>.

⁷⁵ More information is available at <http://berytch.org/>.

⁷⁶ More information is available at <http://beirutdigitaldistrict.com/>.

Figure 26. Connections in the Beirut ecosystem



Source: Mulas and others, 2017.

Secondly, the concept of connectivity was essentially used to qualify interactions within the cities' ecosystem. However, the use of connections for the consolidation of intra-city relations or international networks must be better structured. For example, Beirut is a city in a country where half of graduates emigrate: the population living abroad is 10 times more than the resident population, and most universities have strong international connections. This, in terms of connectivity, would produce a much more complex analysis than the ones presented in figure 25 and figure 26.

Thirdly, and most significantly, the connectivity issue has a political economy dimension. The concentration of connectivity networks around a few focal companies or investors could have a reverse effect on the useful aspect of connectivity, namely limiting freedom, development and growth instead of strengthening them by multiplying the chances of random collisions between actors in the ecosystem. At its last event in July 2017,⁷⁷ Endeavor Lebanon showed how the connections in the Beirut ecosystem were organized around three major tech companies; however, the Minister of Telecommunications admitted that the sector had not progress as promised. One of the major issues was landline Internet infrastructure: the right infrastructure for businesses is not easy and needs a lot of political consent.⁷⁸

C. CONCLUDING REMARKS

Arab countries should adopt an array of approaches to foster innovation in MSMEs tailored to the variable contexts in different sectors (service, trade, manufacturing) and locations (urban or rural).

While experience shows that it is most profitable to build innovation ecosystem in the cities in urban areas where the interaction between MSMEs, entrepreneurs and the environment will generate better growth and will create more job opportunities, innovation in rural areas in the Arab region should get specialized attention given the importance of the role of agriculture in the Arab region.

⁷⁷ More information is available at <https://www.eventbrite.com/e/endeavorize-lebanon-tickets-35405425581>.

⁷⁸ Farhat, 2017.

V. MSMEs AND INNOVATION IN SELECTED ARAB COUNTRIES

Some Arab countries have developed strategies addressing the need to develop MSMEs, and their contribution to the economy and employment, linking such development to innovation. The present chapter provides examples and key initiatives from Egypt, Lebanon, Oman, Qatar and the United Arab Emirates, along with challenges derived from the assessment of the results of such initiatives.

A. EGYPT

Egypt has implemented a wide programme to promote SMEs and innovation, involving the Government, international institutions and private initiatives and clusters.⁷⁹ However, despite many successful cases, starting a new business remains challenging in Egypt, especially after the events of 2011.⁸⁰

Assessing the size and role of SMEs in Egypt remains a challenge. The results of the 2017 general census were recently published, revealing the following:

- There are 6.42 million formal and informal firms in Egypt compare with 4.59 million in 2006;⁸¹
- Around 58 per cent of those firms are in urban areas versus 63 per cent in 2006;
- Around 64.1 per cent (4,115 million) of those firms are active, including 266,000 public firms and establishments, 9,615 cooperatives, 30,167 non-governmental organizations and only 91,880 unregistered enterprises;
- Around 89.6 per cent of those firms are privately owned compared with 6.5 per cent owned by the Government;
- Around 51.2 per cent of those firms are active in trade, 8.6 per cent in manufacturing and 2.5 per cent in agriculture;
- Around 39.6 per cent of employed individuals work in trade (37.6 per cent in 2006) and 2.5 per cent in agriculture (0.7 per cent in 2006). Employment in manufacturing dropped from 27.5 per cent in 2006 to 13.1 per cent. This significant drop was largely in favour of “other services” such as food and lodging, transport and storage, health and household services;
- Around 34.5 per cent of private firms are own-account enterprises: 54.9 per cent had two to four employees, 7.8 per cent had between five and nine, 1.1 per cent had 10-14, and 14 per cent had 15-49. This distribution varies greatly between Egyptian governorates.

In 2016, a private equity firm issued a report indicating that SMEs accounted for 70-80 per cent of GDP in Egypt and employed 66 per cent of the country’s work force (around 20 million workers). Moreover, contrary to many other Arab countries and world tendencies, the report found that 51 per cent of SMEs were concentrated in manufacturing and contributed 13 per cent to total industrial production, while medium enterprises contributed 46 per cent.⁸²

Part of the information in the 2016 report is based on results of an SME census/survey launched by the Central Bank of Egypt. The survey only covered registered firms, employing five workers or more, with a significant economic added value. This effectively excluded informal firms estimated to comprise 20 per cent

⁷⁹ The list of initiatives includes: The Industrial Modernization Centre established in 2000; a 4-year Industrial Development Strategy of 2016; legislation to promote public procurements through SMEs; the Central Bank of Egypt’s five-year lending programme of 2016 with EGP 200 billion and its directive to banks to raise SME lending to 20 per cent of the portfolio; the industrial zones; the Innovation Centre of Cairo’s Smart Village; and numerous business angels, such as Cairo Angels.

⁸⁰ African Development Bank and others, 2017.

⁸¹ Compared with IFC data mentioned above.

⁸² First Equity Partner, 2016.

of total firms, a large percentage of micro enterprises with less than 5 employees, and mom-and-pop enterprises. Consequently, only 36,492 enterprises of 401,765 (formal and informal) were considered, which had between 5 and 50 workers in the 2017 census and employed 3.76 million workers overall.⁸³ Therefore, the results, including the predominance of the manufacturing sector, was based on this sample, which may have distorted the results. El-Said and others (2014) also found that only 6 per cent of SMEs represented in the census/survey were exporting, with a higher percentage (24-34 per cent) for enterprises with the most capital (EGP 30 million and above), largest workforce (50 and more), or the largest turnover (EGP 20 to 50 million). For smaller enterprises, exports were mostly directed towards other Arab countries.

Although the banking reform programme was meant to enhance SME access to finance and banking services, it was found that incentives for banks to build SME portfolios were still weak owing to high costs, high risks and a lack of innovation in bank products and services.⁸⁴ Other research has shown that, despite the range of initiatives to promote MSMEs, there is no productivity differential between formal and informal firms in Egypt; and although innovation and diversification are acknowledged as drivers of growth, the industrial policy of Egypt has failed to achieve structural transformation.⁸⁵

These observations were made while Egypt saw major improvements in its innovation score in world indicators. The total number of researchers have increased significantly, especially in public universities. Gross domestic expenditure on research and development has also increased from 0.27 per cent in 2008 to 0.71 per cent of GDP in 2014. Moreover, publications in international periodicals increased threefold between 2005 and 2014. However, 51 per cent of researchers are working for the agriculture sector, and only 3.7 per cent of them are in private firms (2014 figures). The Egyptian patent registration office has not observed significant growth in patents, especially by resident Egyptians who account for only 15.9 per cent of total registered patents (84.9 per cent were made by non-residents).⁸⁶

Although some improvements have been made in delivering on targeted policies in Egypt, MSMEs still face the following major challenges:

- There is a gap in SME policies that make them inadequate to meet enterprise needs;
- The effectiveness of policies is hindered by the large number of informal businesses in the sector, which alters competition;
- Existing policy tools seem to support medium established industrial enterprises above smaller and younger enterprises that could grow faster in service delivery;
- Institutions responsible for MSME support programmes lack coordination, leading to the potential failure of programmes to deliver on benefits.⁸⁷

B. LEBANON

In Lebanon, the Ministry of Economy and Trade announced an SME strategy in 2014.⁸⁸ It recognized the adoption of the Integrated Small and Medium Enterprise Support Programme, launched in 2004 with European Union assistance with the aim of offering non-financial services through three business development centres: Berytech, BIAT and SouthBIC.⁸⁹ The strategy report showed that of the 70,063 enterprises in Lebanon,

⁸³ El-Said and others, 2014.

⁸⁴ Creative Associates International, 2014.

⁸⁵ Loewe, 2015; Al-Haddad, 2016; Helmy, 2017.

⁸⁶ Helmy, 2017.

⁸⁷ Creative Associates International, 2014, pp. 8-9.

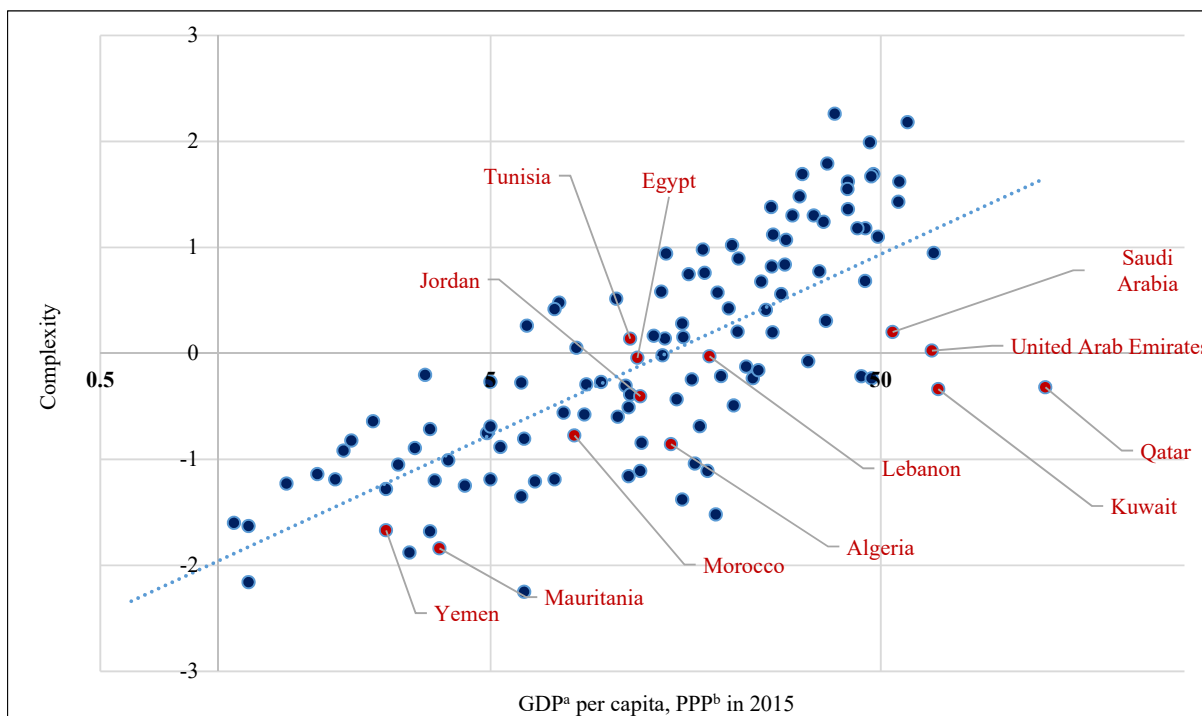
⁸⁸ Lebanon SME Strategy, Ministry of Economy and Trade, 2014.

⁸⁹ See also, ETF: *Labour Market and Employment Policy in Lebanon*; September 2014.

47 per cent were sole proprietorship, 29 per cent were holdings, and 12 per cent limited liabilities.⁹⁰ Around 80 per cent of firms were micro enterprises, 16 per cent were small enterprises and 3 per cent were medium enterprises.⁹¹

The SME strategy report conducted an analysis through the Index of Economic Complexity of the University of Harvard⁹² as it considers this index a measure of the knowledge in a society that gets translated into the products it makes. However, a world comparative analysis of the index data (figure 27) does not match the conclusions of the report: positive evolution of the country towards more varied, unique and complex set of capabilities, and hence an increase in overall competitiveness.

Figure 27. Economic Complexity Index, 2016



Source: Author's calculations.

Notes: ^a In thousands of USD.

^b PPP = Purchasing Power Parity.

Nevertheless, the report identifies the most salient challenges the country faces in terms of SME development: the middle management gap; an ephemeral system of capabilities; a mismatch in demand and supply of capabilities; a distorted cost of capital, leading to weak capital basis; a capital mismatch; limited appetite for outside investors; an unlevel playing field; trading inefficiencies; weak creditor protection; persistent red tape; companies in perpetual limbo; untapped innovation potential; nascent IP protection; shallow capital markets; and infrastructure patches. The report concludes with a clear call for action, with numerous key strategic thrusts and a roadmap. Here again, the Central Bank has taken the lead to boost policies

⁹⁰ Based on the data from the Ministry of Finance.

⁹¹ The turnover thresholds were respectively set at 500 million, 5,000 million and 25,000 million LBP (i.e. around \$300,000, 3,000,000 and 17,000,000, respectively).

⁹² See Atlas of Economic Complexity, available at <http://atlas.cid.harvard.edu/>.

for SMEs and innovation, from the *Kafalat* system to circular 331,⁹³ the former providing credit guarantees to SMEs and the latter offering seed money.

C. OMAN

In 2013, the Central Bank of Oman (CBO) issued a regulation stipulating that commercial banks were required to allocate at least 5 per cent of their total loans to SMEs by 2014, and requiring regular reports on the progress made.⁹⁴

CBO also launched a survey on MSMEs in 2014, showing that MSME contribution to the economy and employment was much less than reported by the World Bank and International Monetary Fund. The analysis of the survey was unique in the Arab region owing to its detail, scope and insight. The report included several recommendations on institutions and policies, regulations, access to funding, opportunities and infrastructure, as follows:

- Broadening the business cluster concept to sectors other than the ICT sector;
- Adopting policy incentives, like subsidizing SME training and aligning worker benefits with the public sector, to attract national employees to the sector because most workers in Oman are foreigners;
- Introducing tax and some fee exemptions for SMEs, while increasing taxation for large successful enterprises and corporations to achieve a more equal playing field;
- Governing business incubators effectively with clear mandates and operation frameworks that include identification of target markets, admission and exit rules and quality standards, tracking success stories for learning, and having informed staff;
- Providing the National Centre for Statistics and Information with the resources and capacity necessary to gather data on the SME sector, with emphasis on quality, reliability and timeliness. Such data is essential for developing better policies.⁹⁵

D. QATAR

Qatar has launched Enterprise Qatar, a company aiming to develop and promote SMEs, but its role has remained limited.⁹⁶ The International Monetary Fund found that SMEs in Qatar were weak, with only 9,011 SMEs contributing to 15 per cent of non-oil GDP in 2010 and to 20 per cent of total employment in 2011.⁹⁷

The Qatar National Food Security Programme was established in 2008 to promote innovation in the agriculture and water sectors. However, its role has remained limited, as success requires better planning and greater investment.⁹⁸ The 2030 vision mentions the need to provide financial and non-financial support mechanisms to help incubate and grow SMEs. However, no major programme has yet been launched to that end.⁹⁹

⁹³ For more information on Circular 331, see <http://bdlaccelerate.com/2016/>.

⁹⁴ Central Bank of Oman, 2013; Central Bank of Oman, 2017.

⁹⁵ Central Bank of Oman, 2014.

⁹⁶ More information on Enterprise Qatar is available at <https://www.mdps.gov.qa/en/media/events/Documents/EQ.pdf>.

⁹⁷ IMF, 2013.

⁹⁸ Bizri, 2017.

⁹⁹ Qatar, General Secretariat for Development Planning, 2008.

E. UNITED ARAB EMIRATES

The United Arab Emirates has long promoted the key role of SMEs, making different financing mechanisms available to startups (table 6). SMEs are estimated to represent 60 per cent of the country's GDP, and account for 90 per cent of employment. Around 43 per cent of SMEs are in the Emirate of Dubai, 32 per cent in Abu Dhabi and 16 per cent in Sharjah. Around 73 per cent of the total number of SMEs are in trade and retail.

However, no detailed analysis of the SME sector has been conducted, and obtaining data on those enterprises and the number of employees is problematic as each emirate collects its own data, and data aggregation for SMEs in the country is not available. Another problem is that ownership of SMEs is not disaggregated by nationality; this is necessary as foreigners cannot own more than 49 per cent of a company.

Table 6. Main players in the SME financing landscape in the United Arab Emirates

Government	Federal entities	Ministry of Economy				Central Bank			
	Country-wide SME entities	Khalifa Fund							
	Local SME agencies	Dubai SME		Ruwad Establishment		Saud Bin Rashid Al Mualla Programme for Youth Projects Support		Saud Bin Saqr Program for Young Business Leaders	
	Emirate-level department of economic development	Abu Dhabi DED	ABCED	Dubai DED	Sharjah DED	Ajman DED	Fujairah DED	Umm Al Quwain DED	Ras Al Khaimah DED
	Emirate-level chamber of commerce	Abu Dhabi Chamber	Dubai Chamber	Sharjah Chamber	Ajman Chamber		Fujairah Chamber	Umm Al Quwain Chamber	Ras Al Khaimah Chamber
	Statistical departments	SCAD			Dubai Statistics Centre		National Bureau of Statistics		

Source: Khalifa Fund for Enterprise Development, 2013.

Financing SMEs is also cumbersome, partly owing to the frequent inflow and outflow of residents complicating customer relationships between people and banks, thus leading to high-risk premiums for borrowing SMEs, especially in Abu Dhabi and Dubai. Thus, the share of SMEs in bank lending is still limited to around 4 per cent compared with a MENA average of 9.3 per cent, which pushed the central bank to draft specific rules on banks in favour of SMEs.¹⁰⁰

Schiliro (2015) sheds a different light on the Emirati entrepreneurship environment, showing that Arab expatriates lead in creating new businesses, followed by Emiratis, and then by Asian or Western expatriates. Meanwhile, 82 per cent of Emiratis and 61 per cent of Arab expatriates are already in full-time employment while creating those new businesses, suggesting that a large percentage of Emirati entrepreneurs are government employees.

Less than 3 per cent of startups in Dubai have mid or high-tech products, while SMEs in the manufacturing sector are most likely to innovate with those in the services sector innovating less.¹⁰¹ MSMEs represent 95 per cent of all enterprises (72 per cent micro and 18 per cent small), account for 42 per cent of the workforce, and contribute to around 40 per cent of GDP. Only 8 per cent of surveyed MSMEs maintain an

¹⁰⁰ Khalifa Fund for Enterprise Development, 2013., p. 9.

¹⁰¹ Schiliro, 2015; United Arab Emirates, Dubai SME, 2014.

annual research and development budget, and only 13 per cent have implemented innovation at the product or service level. Innovation was mostly employed for product/services development (42 per cent), and less for internal processes (30 per cent) or distribution and delivery (28 per cent). Exporting firms are eager to implement innovation to increase global competitiveness.¹⁰²

F. CONCLUDING REMARKS

Only few Arab countries have developed strategies or national programmes for promoting the role of MSMEs in the economy and job creation. Some have specific regulations or incentives to promote competitiveness and innovation in MSMEs. Information and knowledge about SMEs in Arab countries, their evolution and dynamism are therefore very much needed.

Analysis of the available literature shows a number of challenges facing the MSME ecosystem and innovation in SMEs in Arab countries, summarized as follow:

- A lack of information and data on MSMEs to devise efficient policies;
- A lack of large-scale planning efforts for MSMEs in rural areas, especially in the agriculture and water sectors;
- A lack of clearer mandates, articulated management and more effective management of incubators;
- Deficiencies in quality education, training and human resource development, resulting in most patent registrations being made by nationals living abroad;
- Difficulties in evaluating MSMEs in countries where ownership, and the workforce, is overwhelmingly foreign, such as in Gulf countries;
- A lack of strong central bank directives and incentives for MSME lending;
- Weak drivers for fostering innovation in MSMEs, including the manufacturing sector;
- Weak drivers towards micro and small enterprises compared with existing medium enterprises;
- Concentration of innovation policies, when available, on technological startups, and the need to take into account the complexity of a country's economic and social ecosystem in a globalized world;
- A lack of initiatives to bring innovation to informal MSMEs to foster growth, employment and formalization;
- Inequalities of opportunities in innovation incentives between MSMEs versus the need to create a level-playing field and rule of law for all;
- Gaps and a lack of interaction between various institutions involved in the innovation framework, and the need for strong coordinating bodies;
- Missing links between policies and application.

All Arab countries therefore have a long way to go to implement effective innovation-driven policies for MSMEs.

¹⁰² Schiliro, 2015, p. 154.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSION

MSME and innovation development is deeply imbedded in the SDGs, but those links are rarely addressed in studies and analyses on SDGs. However, they are explicitly mentioned in SDGs 8 and 9, especially in target 8.3. Informal employment and the economy are highlighted as major issues, so much so that the official United Nations indicator for target 8.3 is the proportion of informal employment in non-agriculture employment, by sex.

The Sustainable Development Solution Network developed the SDG Index on its own set of indicators. According to that Index, most Arab countries appear far from achieving the SDGs, including goals 8 and 9. Moreover, the most recent SDG Index report points to negative spillover effects from high to low-income countries, especially in terms of water depletion and the environment. The Global Innovation Index (GII) also reports continuous decline in innovation scores and rankings for most Arab countries. Moreover, the 2017 GII report, focusing on sustainable agriculture and food security, points out that 14 of the 20 most water-scarce countries in the world are in the MENA region.

Measuring the numbers, MSME sectorial distribution and role in the economy appear to be a major challenge for Arab countries. Data from business registers are incomplete or unavailable, and surveys are rare and partial. This makes the MSME database of the IFC and the World Bank lack consistency; comparison of those sources with results of labour force surveys highlight large discrepancies. Innovation and other policies towards MSMEs risk being incompatible with reality if no proper knowledge on the MSME ecosystem and informality is acquired.

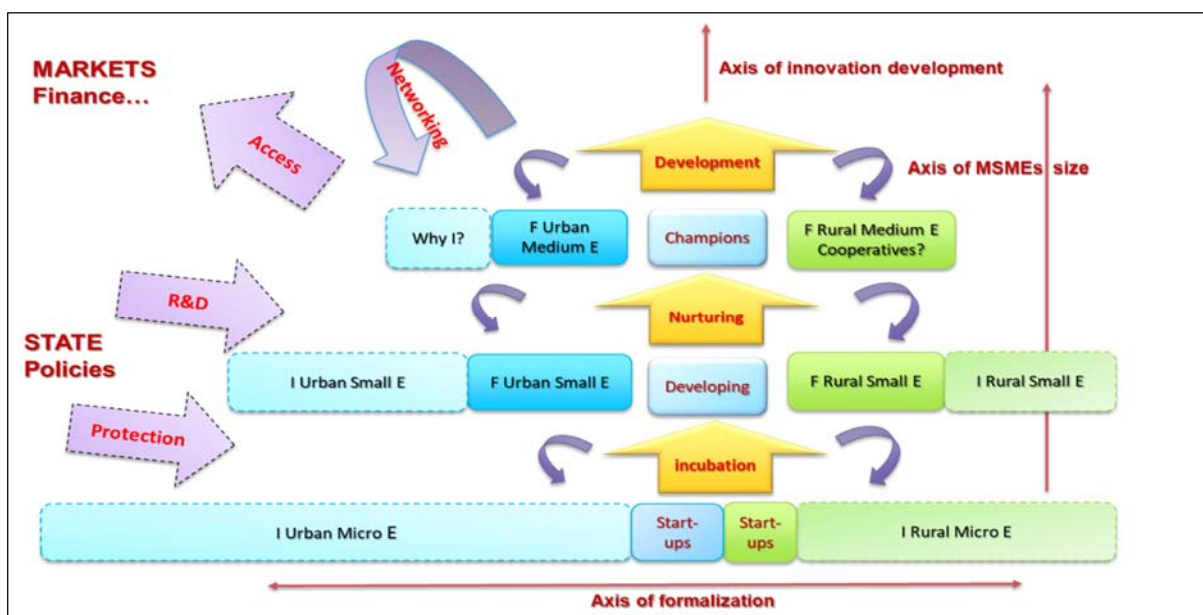
The SME Policy Index shows that many Arab countries have developed innovation strategies covering MSMEs or are currently developing them. However, much remain to be done, including creating innovation coordination bodies, better informing MSMEs about financial and non-financial services, and developing networks and clusters, to better monitor and evaluate the real effects of the measures adopted.

ESCWA has developed a general innovation policy framework for Arab countries. Literature shows that it is important to differentiate between the diverse sectors of the economy, especially between rural and urban MSMEs. Rural MSMEs are widely distributed and necessitate an appropriate policy framework that can deal with this geographical characteristic. In contrast, cities concentrate MSMEs in different sectors, having as a main advantage the multiplication of possible interactions between similar MSMEs, as well with universities, research centres and other actors. This networking and connectivity ecosystem has resulted in the active development of cities as innovation hubs, to the detriment of technological parks such as Silicon Valley. This does not only concern technological MSMEs, but provides all MSMEs with a diverse ecosystem that they can rely on.

B. INNOVATION POLICIES FOR MSMEs

Innovation policies for MSMEs should address technology startups as well as companies that introduce innovation to boost productivity and employment. This is an essential condition to reach a level where MSMEs become the drivers of innovation in the economy of developed countries.

Figure 28. Simplified representation of the MSME environment for innovation



Source: Developed by author.

Note: I: informal enterprises; F: formal enterprises; and E: enterprises.

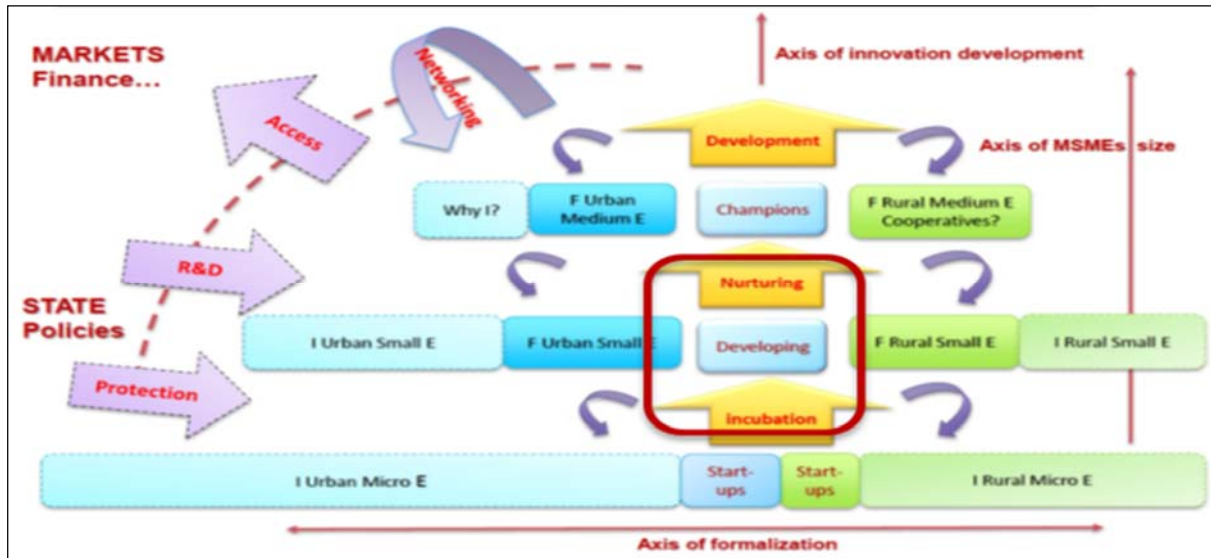
Innovation policies need to address the overall environment of MSMEs, their characteristics and size, as well as their distribution across different economic sectors. Needs and approaches vary significantly by sector and the enterprise characteristics.

The MSME environment is complex, especially in developing countries where the informal economy contributes significantly to employment and added value. Figure 28 differentiates between rural and urban environments in that regard. It shows that innovation policies should not address business-to-business (B2B) MSMEs and business-to-consumer (B2C) enterprises in the same way.

This representation is built on the following three axes:

- *Axis of formalization:* Most enterprises, especially micro enterprises, are informal. Technological startups can also be informal at their very early stages. Innovation policies should address the role of innovation in formalization and more importantly in growth, as well as how to develop productivity and employment even if such enterprises remain informal. Informality is generally a result of a country's ecosystem.
- *Axis of size:* Innovation policies cannot address micro enterprises and medium and large enterprises in the same way. Methods to foster innovation largely depend on size. Many current innovation policies focus only on medium enterprises or on startups, leaving behind a large number of micro and small enterprises. Such policies could aggravate gaps in the economy and within society, thus risking stability.
- *Axis of innovation and development:* Enterprises go through different stages in their development to absorb and produce innovation: incubation, nurturing and development. Innovation policies and frameworks should adopt different approaches to enterprises according to their stage of development because their needs vary. The development of MSMEs is not necessarily linked to a large increase in their size (as measured by the number of employees). The technological advantage of a country could be built on a large spectrum of innovative MSMEs, stable in size, each with its own specialty, providing their products and services to larger labour intensive and consumer market companies.

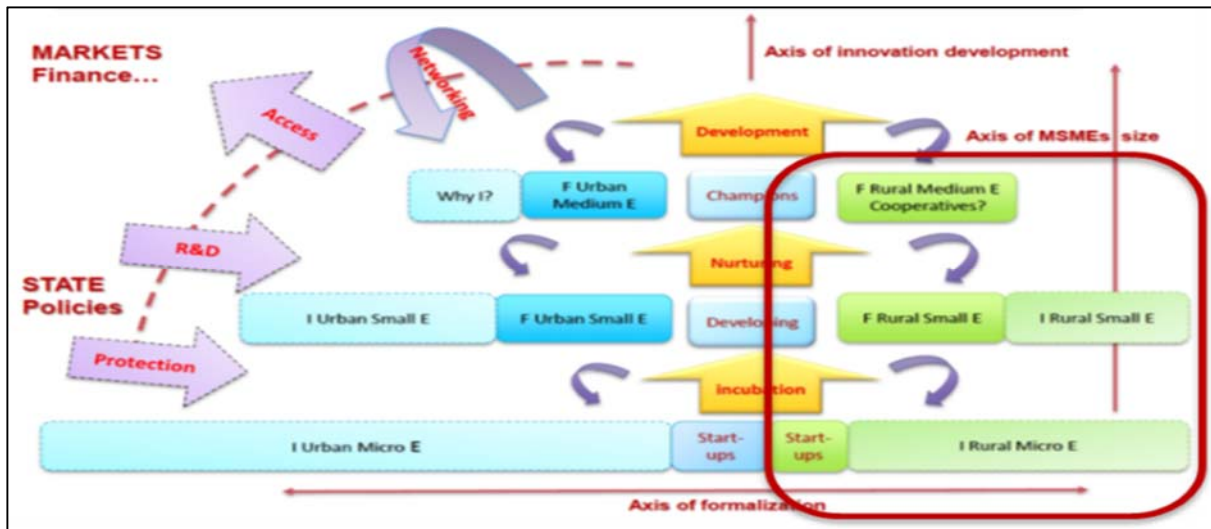
Figure 29. Innovation needs of small technological startups



Source: Developed by the author.

Figure 2 separates between rural and urban MSMEs only. A detailed representation should address different economic sectors in both environments; for example, agriculture or bio-tourism in rural areas, and the different sectors of manufacturing, trade, services and tourism in urban areas. Based on such a representation, innovation policies can address each sub-MSME sector or environment function according to its needs and priorities. For example, the innovation needs of small technological enterprises are mostly linked to the development of cities' clusters, incubators and networking, availability of venture capital, ease of regulations on bankruptcy and international market access (figure 29).

Figure 30. Innovation needs of MSMEs in agriculture



Source: Developed by the author.

In contrast, the needs of MSMEs in the agriculture sector are linked to government policies on managing water and agricultural production, incentives for adopting new technologies on water scarcity and food security, and the promotion of cooperatives to value production and enhance added value, micro-credit and policies towards regional management, social security and general services availability (figure 30).

C. RECOMMENDATIONS

Based on the analysis in the pre-set report and discussions at numerous ESCWA meetings¹⁰³ on innovation and technologies, the following list of recommendations for the Arab countries aims to address policy gaps, low levels of innovation in SMEs and challenges related to the role of MSMEs in societies:

- Encourage international organizations and Arab Governments to jointly focus on collecting information and undertaking statistical surveys to assess MSMEs, their contribution to employment and the economy in Arab countries, and to evaluate the impact of innovation and technology on MSMEs;
- Conduct more research on formal and informal MSMEs in Arab countries and call upon business communities and chambers of commerce and industry to publish periodic reports on MSMEs;
- Coordinate and harmonize efforts to assess and measure MSMEs in any country. Such coordination is needed between business registers, enterprise surveys, labour force surveys and household income and expenditure surveys;
- Adopt policies and strategies for MSMEs in Arab countries, which focus on enhancing the MSME ecosystem and stress the importance of innovation and technology as drivers for sustainability, growth and competitiveness;
- Assess the focus on MSMEs in current innovation policies and initiatives in Arab countries and review/formulate innovation policies to strengthen the components that stimulate innovation in MSMEs in differentiated sectors;
- Develop innovation approaches geared towards uplifting MSMEs among sectors (service, trade, manufacturing), including creating a balance between formalizing informal firms and promoting growth;
- Ensure better urban planning in Arab cities to promote them as innovation and growth hubs for MSMEs in different sectors;
- Focus on innovation in rural areas in the Arab region as the main area for agriculture, which is key sector in the Arab region;
- Conduct awareness-raising campaigns in formal and informal MSMEs on the role of innovation and technology in enhancing their competitiveness in terms of products and services;
- Prompt SMEs to conduct and fund research, development and innovation activities to maintain local, regional and global competitiveness;
- Strengthen the absorptive capacity of new technologies in MSMEs, and stimulate collaboration between SMEs in Arab countries and international companies to facilitate technology transfer and adapt it to the region's needs;
- Develop systems for protecting innovative private companies in Arab countries similar to corresponding protection systems in developed countries;
- Facilitate regulation on MSMEs to encourage the smooth transformation of MSMEs from informal to formal companies.

¹⁰³ ESCWA EGM on Innovation and Technology for Achieving the 2030 Development Agenda, 5-7 December 2018, available at <https://www.unescwa.org/events/sdg-innovation-technology-arab-region>; ESCWA EGM on Mechanisms to Advance Innovation for Inclusive Sustainable Development in the Arab Region, 1-2 November 2016, available at <https://www.unescwa.org/events/mechanisms-innovation-sustainable-development-arab-region>.

Bibliography

- Abdellatif, L. and Zaky, M. (2013). *The Macro-Micro Nexus and the Public Procurement Support Policy for SMEs: the Case of Pharmaceuticals in Egypt*. August. Economic Research Form Working Paper, No. 818. Available at <http://erf.org.eg/publications/macro-micro-nexus-public-procurement-support-policy-smes-case-pharmaceuticals-egypt/>.
- African Development Bank and others (2017). *African Economic Outlook 2017: Entrepreneurship and Industrialisation*. 16th ed. Paris: OECD Publishing. Available at <https://doi.org/10.1787/aco-2017-en>.
- Aita, S. (2017a). *Informal Employment in the Arab Countries, Facts and Rights*. Cercles des Economistes Arabes and ANND, September.
- Aita, S. (2017b). *Issues and traps in labor statistics in the Arab World with a special focus on informal labor*. Arab Trade Union Confederation Report. November. Amman. Available at <http://www.economistes-arabes.org/fr/wp-content/uploads/2017/12/issues-and-traps.pdf>.
- Al-Haddad (2016). *Government Intervention with no Structural Transformation: the Challenges of the Egyptian Industrial Policy in Comparative Perspective*. August. Economic Research Forum Working Paper, No. 1038. Available at <https://erf.org.eg/wp-content/uploads/2016/08/1038.pdf>.
- Bizri, O.F. (2017). *Science, Technology, Innovation, and Development in the Arab countries*. [s.l.]: Academic Press.
- Buehn, A. and Schneider, F. (2009). Shadow economies and corruption all over the world: revised estimates for 120 countries. *Economics: The Open-Access, Open-Assessment E-Journal*, vol. 1, No. 2007-9, pp. 1-53. Available at <http://dx.doi.org/10.5018/economics-ejournal.ja.2007-9>.
- Central Bank of Oman (2013). *Circular BM 1108: Small and Medium Enterprises(SMEs)*. May. Available at [https://cbo.gov.om/pages/viewCircular.aspx?file=/sites/assets/Documents/English/Circulars/2013/BM1108.pdf&Title=%E2%80%8BBBM%201108%20-%20Small%20and%20Medium%20Enterprises%20\(SMEs\)](https://cbo.gov.om/pages/viewCircular.aspx?file=/sites/assets/Documents/English/Circulars/2013/BM1108.pdf&Title=%E2%80%8BBBM%201108%20-%20Small%20and%20Medium%20Enterprises%20(SMEs)).
- Central Bank of Oman (2014). *Towards a Growing, Competitive and Dynamic Small and Medium-Sized Enterprises in Oman: Strategies and Policies*. Occasional Paper, August. Available at <http://www.cbo-oman.org/OccasionalPapers/SME%20Sector%20in%20Oman%20-Paper.pdf>.
- Central Bank of Oman (2017). *Circular BM 1150: Small and Medium Enterprises(SMEs)*. April. Available at [https://cbo.gov.om/pages/viewCircular.aspx?file=/sites/assets/Documents/Global/Circulars/2017/BM1150.pdf&Title=BM%201150%20-%20Small%20and%20Medium%20Enterprises%20\(SMEs\)](https://cbo.gov.om/pages/viewCircular.aspx?file=/sites/assets/Documents/Global/Circulars/2017/BM1150.pdf&Title=BM%201150%20-%20Small%20and%20Medium%20Enterprises%20(SMEs)).
- Creative Associates International (2014). *Micro, Small and Medium Enterprises in Egypt: Entrepreneurship, Business Procedures and Value Chain Analysis*. August. Available at https://www.creativeassociatesinternational.com/wp-content/uploads/2003/01/Micro_Small_and_Medium_Enterprises_in_Egypt.pdf.
- Dutta, S. and others (eds.) (2017). *Global Innovation Index 2017: Innovation Feeding the World*. 10th ed. Available at <https://www.globalinnovationindex.org/userfiles/file/reportpdf/gii-full-report-2017.pdf>.
- Dutta, S. and others (eds.) (2018). *Global Innovation Index 2018: Energizing the World with Innovation*. 11th ed. Available at <https://www.globalinnovationindex.org/gii-2018-report>.

- El-Said and others (2014). Small and medium enterprises landscape in Egypt: new facts from a new dataset. *Journal of Business & Economics*, vol. 5, No. 2, pp. 142-161. Available at <http://www.academicstar.us/UploadFile/Picture/2014-6/201461435324791.pdf>.
- El-Sokari, H. and others (2013). *Entrepreneurship: an Emirati Perspective*. Dubai: Sheikh Zayed University.
- ESCWA (2017a). *The Innovation landscape in the Arab Countries: a Critical Analysis*. Beirut. 19 May. Available at <https://www.unescwa.org/publications/innovation-landscape-arab-countries-critical-analysis>.
- Endeavor Insight (2014). *The Power of Entrepreneur Networks: How New York City became the Role Model for Other Urban Tech Hubs*. November. Available at <http://www.nyctechmap.com/nycTechReport.pdf>.
- Endeavor Insight (2016). *EL Ecosistema del Sector Tech en Santiago, Una evaluacion del ecosistema de emprendimiento de la tecnologia y del software en Santiago*. March. Available at <https://www.endeavor.cl/wp-content/uploads/ESTUDIO-SANTIAGO-TECH-ENTREPRENEURSHIP-ECOSYSTEM-2016.pdf>.
- ESCWA (2017b). *Innovation Policy for Inclusive Sustainable Development in the Arab Region*. Beirut. Available at <https://www.unescwa.org/publications/innovation-policy-inclusive-sustainable-development-arab-region>.
- First Equity Partner (2016). *Small and Medium Enterprises in Egypt, Definition, Landscape and Stakeholders*. May.
- Farhat, R. (2017). *When internet threatens Lebanon's sustainability*. Wamda. 25 July. Available at <https://www.wamda.com/2017/07/internet-threatens-lebanon-sustainability>.
- Florida, R. (2013). *The New Global Startup Cities*. Citylab, 4 June. Available at <http://www.citylab.com/work/2013/06/new-global-start-cities/5144/>.
- Florida, R. (2014a). *The Rise of the Creative Class*. New York: Basic Books.
- Florida, R. (2014b). *Startup City: the Urban Shift in Venture Capital and High Technology*. Toronto: Martin Prosperity Institute. March. Available at <http://martinprosperity.org/media/Startup-City.pdf>.
- Hampel-Milagrosa and others (2014). *Which Factors Determine the Upgrading of Small and Medium-Sized enterprises (SMEs)? Evidence Egypt, India and the Philippines*. November. Economic Research Forum Working Paper, No. 866. Available at <http://erf.org.eg/publications/which-factors-determine-the-upgrading-of-small-and-medium-sized-enterprises-smes-evidence-egypt-india-and-the-philippines/>.
- Hassanin, M.E. and Hamada, M.A. (2016). Intelligent national innovation system for regional development in Egypt: a proposed conceptual model. *International Review of Management and Business Research*, vol. 5, Iss. 2, pp. 507-518.
- Helmy, H. (2017). *Egyptian Science, Technology and Innovation Observatory*. Presented at Fifth Session of the Arab Forum for Scientific Research and Sustainable Development, Khartoum, December. Available at http://www.alecso.org/rasd/2017/Docs/Scientifics_Papers/Second_Day/Second_Session/Hayam_Helmi.pdf.

- IFC (2004). *SME Landscape in Egypt: A Banking Sector Perspective*. Washington, DC: World Bank Group.
- IFC (2010). *The SME Banking Knowledge Guide*. 2nd ed. Washington, D.C.: World Bank Group. Available at <https://www.ifc.org/wps/wcm/connect/b4f9be0049585ff9a192b519583b6d16/SMEE.pdf?MOD=AJPERES>.
- ILO (2013). *Measuring Informality: A Statistical Manual on the Informal Sector and Informal Employment*. October. Available at http://www.ilo.org/global/publications/ilo-bookstore/order-online/books/WCMS_222979/lang--en/index.htm.
- ILO (2015). *Recommendation No. 204 concerning the Transition from the Informal to the Formal Economy*. Meeting document prepared for the 104th Session of the International Labour Conference, Geneva, June. Available at https://www.ilo.org/wcmsp5/groups/public/---ed_norm/---relconf/documents/meetingdocument/wcms_377774.pdf.
- ILO (2018). *Women and Men in the Informal Economy: A Statistical Picture*. 3rd ed. Geneva: International Labour Organization. Available at http://www.ilo.org/global/publications/books/WCMS_626831/lang--en/index.htm.
- IMF (2013). *Qatar: 2012 Article IV Consultation*. Country Report No. 13/14. January. Available at <http://www.imf.org/en/Publications/CR/Issues/2016/12/31/Qatar-2012-Article-IV-Consultation-40249>.
- Katz, B. and Wagner, J. (2014). *The Rise of Innovation Districts, A New Geography of Innovation in America*. Metropolitan Policy Program. Washington, D.C.: Brookings Institution. Available at <https://www.brookings.edu/essay/rise-of-innovation-districts/>.
- Khalifa Fund for Enterprise Development (2013). *SME Financing in the United Arab Emirates*. Abu Dhabi.
- Kushnir, K. and others (2010). *Micro, Small, and Medium Enterprises Around the World: How Many Are There, and What Affects the Count?* MSME Country Indicators. Available at <https://www.ifc.org/wps/wcm/connect/9ae1dd80495860d6a482b519583b6d16/MSME-CI-AnalysisNote.pdf?MOD=AJPERES>.
- Lebanon, Ministry of Economy and Trade (2014). *Lebanon SME Strategy: a Roadmap to 2020*. November. Available at http://www.economy.gov.lb/public/uploads/files/6833_5879_4642.pdf.
- Loewe, M. (2015). *Transforming Egypt: Innovation and Diversification as Drivers of Growth*. *Economic Research Forum Policy Brief*, No. 1, June. Available at <http://erf.org.eg/publications/transforming-egypt-innovation-and-diversification-as-drivers-of-growth/>.
- Mercan, B. and Göktaş, D. (2011). Components of Innovation Ecosystems: A Cross-Country Study; *International Research Journal of Finance and Economics*, No. 76, pp. 102-112.
- Mulas, V. and others (2015). *Boosting Tech Innovation Ecosystems in Cities; A Framework for Growth and Sustainability of Urban Tech Innovation Ecosystems*. Working Paper, No. 100899. The World Bank. Available at <http://documents.worldbank.org/curated/en/623971467998460024/Boosting-tech-innovation-ecosystems-in-cities-a-framework-for-growth-and-sustainability-of-urban-tech-innovation-ecosystems>.
- Mulas, V. and others (2017). *Tech Start-up Ecosystem in Beirut: Findings and Recommendations*. World Bank. September. Available at <http://documents.worldbank.org/curated/en/702081504876957236/Tech-start-up-ecosystem-in-Beirut-findings-and-recommendations>.

- OECD and others (2014). *SME Policy Index: The Mediterranean Middle East and North Africa 2014: Implementation of the Small Business Act for Europe*. September. Paris: OECD Publishing. Available at <https://doi.org/10.1787/9789264218413-en>.
- OECD and Statistical Office of the European Communities (2005). *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data*. 3rd ed. November. Paris. Available at https://www.oecd-ilibrary.org/science-and-technology/oslo-manual_9789264013100-en.
- Qatar, General Secretariat for Development Planning (2008). *Qatar National Vision 2030*. July. Available at https://www.mdps.gov.qa/en/qnv/Documents/QNV2030_English_v2.pdf.
- Schiliro, D. (2015). Innovation in Small and Medium Enterprises in the United Arab Emirates. *International Journal of Social Science Studies*, vol. 3, No. 5, pp. 148-160. Available at <http://redfame.com/journal/index.php/ijsss/article/view/1014>.
- SDSN (2017). *Global Responsibilities. International Spillovers in Achieving the Goals*. July. Available at <http://www.sdgindex.org/reports/2017/>.
- SDSN (2018a). *SDG Index and Dashboards Report 2018: Global responsibilities: implementing the Goals*. July. Available at <http://www.sdgindex.org/reports/2018/>.
- SDSN (2018b). *United Nations Sustainable Development Solution Network: Vision and Organization*. Available at <http://unsdsn.org/about-us/vision-and-organization/>.
- Statistiques Tunisie (2017). *Statistiques issues du Répertoire National des Entreprises 2016*. September. Available at <http://www.ins.tn/fr/publication/statistiques-issues-du-r%C3%A9pertoire-national-des-entreprises-2016>.
- UNCTAD (2017). *The role of science, technology and innovation in ensuring food security by 2030*. New York: United Nations. 17 February. Available at <http://unctad.org/en/pages/PublicationWebflyer.aspx?publicationid=1774>.
- United Arab Emirates, Dubai SME (2014). *The State of Small & Medium Enterprises in Dubai*. Available at http://www.sme.ae/studiesandresearchdocument/sme_report_english.pdf.
- United Nations 2018. *Sustainable Development Knowledge Platform*. Department of Economic and Social Affairs. Available at <https://sustainabledevelopment.un.org/sdgs>.

