

MAKING DEVELOPMENT HAPPEN

AGRO-FOOD JOBS FOR YOUTH IN EGYPT, MOROCCO, AND TUNISIA

IMPLEMENTATION
REFORM PRODUCTIVITY
DEVELOPMENT POLICIES
INFRASTRUCTURE ACCESS SKILLS
EQUALITY
INVESTMENT EDUCATION
WELL-BEING PROGRESS
QUALITY

Making Development Happen

Volume 8

Agro-food Jobs for Youth in Egypt, Morocco and Tunisia

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Foreword

Young people, the demographic group aged 15-24, represent more than one-third of the total population in Middle East and North Africa (MENA) region. As such, they are one of the region's biggest assets. The crisis induced by the COVID-19 pandemic has hit young people in MENA particularly hard, compromising the quantity and quality of education, impeding transitions to the labour market and undermining longer-term employment opportunities. As the region recovers from the pandemic and faces new challenges – including the disruption of global food value chains and climate change – it is critical to ensure that young people have access to attractive employment opportunities and are equipped with the right skills, in order to be resilient to ongoing structural transformations and to any new shocks.

This report demonstrates how employment in one sector – agro-food – can provide economic opportunities and improve livelihoods of young people in MENA region, with a special focus on Egypt, Morocco and Tunisia.

This report is delivered within the framework of the project “COVID-19 Response and Recovery in MENA Region”, which is supported by the Ministry of Foreign Affairs and International Cooperation of Italy, and jointly implemented by the OECD Development Centre, the MENA-OECD Governance Programme within the Directorate for Public Governance, and the International Academy for Tax Crime Investigation within the Centre for Tax Policy and Administration. The project also involves two OECD Centres based in Italy: the OECD Training Centre on Public Governance, hosted by the *Scuola Nazionale dell'Amministrazione* in Caserta; and the OECD International Academy for Tax and Financial Crime Investigation, hosted by the Economic and Financial Police School of the *Guardia di Finanza* in Ostia.

The project itself is part of a long-lasting partnership between the OECD and MENA countries. Since 2005, the MENA-OECD Initiative, created at the request of MENA countries, facilitates co-operation between the OECD and MENA region to promote policies for sustainable and inclusive growth. It has been bringing economies from the region closer to the OECD by deepening dialogue among various entities and supporting MENA reform agendas. Many MENA economies have intensified their participation in OECD bodies while also boosting adherence to legal instruments. They have integrated several statistical reporting, information systems and benchmarking exercises, and continued to participate in OECD Global Fora, publications, and policy reviews. The OECD also provides country-specific support for Morocco and Egypt through country programmes, which help enable these partner economies to leverage OECD expertise and best practices, strengthen institutions, build capacity for successful policy reforms and align themselves to OECD standards. Three countries – Egypt, Morocco, and Tunisia – are full members of the OECD Development Centre. Italy is the Co-Chair of the MENA-OECD Governance Programme and a strategic supporter since its inception, through both financial contribution and active engagement in regional peer-to-peer dialogue and capacity-building activities.

This report aims to help policy makers – notably ministries of youth, labour and agriculture, as well as other line ministries, government agencies and their partners – strengthen administrative capacities to deliver policies, programmes and services that respond to the skill and employment needs of young people. Ultimately, it should help the governments of Egypt, Morocco and Tunisia to create more jobs, and to empower young people to match their talents and aspirations with productive demands in the labour market, especially in the agro-food sector.

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Acronyms and abbreviations

AAS	agriculture advisory services
AUC	African Union Commission
CPC	Central Product Classification
CSEFRS	Council for Education, Training and Scientific Research
EAS	extension and advisory services
EU	European Union
FAO	Food and Agriculture Organization (UN)
Fintech	financial technology
GCC	Gulf Cooperation Council
GIS	geographic information system
ICT	information and communication technology
ILO	International Labour Organisation
ISCO	International Standard Classification of Occupations
ISIC	International Standard Industrial Classification
iVCD	inclusive value chain development
MENA	Middle East and North Africa
MOOCs	massive open online courses
NAQAAE	National Authority for Quality Assurance and Accreditation of Education
NEET	not in employment, education or training
NGO	non-governmental organisations
NQF	National Qualification Framework
OSH	occupational safety and health
OECD	Organisation for Economic Cooperation and Development
PIRLS	Progress in International Reading Literacy Study
PISA	Programme for International Student Assessment
PPPs	public-private partnerships
RPL	recognise prior learning
RVA	recognition, validation and accreditation
SMAG	Salaire minimum agricole garanti (guaranteed minimum wage specifically for
SMEs	small and medium enterprises
SWTS	Social-to-Work Transition Surveys
TIMSS	Trends in International Mathematics and Science Study
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organisation

Executive summary

Agro-food value chains hold untapped opportunities to help address the youth unemployment problem in Egypt, Morocco and Tunisia. Expanding and strengthening domestic segments of agro-food value chains in these countries could improve the economic and social well-being of young people and their families; fulfil the demand for more and better agricultural products; and increase the capacity of their economies to face up to the interrelated challenges of optimal resource use, climate change, technological transformation, and disruption of global food value chains.

This case is built around three key observations.

The first observation is that Egypt, Morocco and Tunisia are in the midst of a demographic transition that can offer unprecedented socio-economic benefits, but which are yet not fully grasped. Currently, children and young people constitute over 49% of the total population in Egypt, 42% in Morocco, and 38% in Tunisia. The coming decades will continue bringing a massive influx of new young entrants into labour markets, demanding good quality jobs. Many of these young workers still live in rural areas, and the vast majority have medium or low levels of skill. Youth unemployment rates in these countries are among the highest in the world, especially for young women. Yet, these young people do aspire for better prospects than their parents did.

The second observation concerns the development and the current state of the agro-food value chains in the three countries. With both population and per-capita incomes increasing, demand for agro-food products is expected to continue growing in the coming decades (although price increases may restrain this growth). Rising incomes are also likely to alter diets. Urbanisation, in turn, will increase demand for processed and prepared convenience foods, as well as for foods served through restaurants and catering. Such trends are also changing food purchasing habits, through the growing role of supermarkets. Yet, under the effect of multiple, cascading international crises, a growing number of individuals in the region are actually facing food insecurity.

The third observation is that a huge potential at the intersect of these two trajectories remains largely underexploited. Currently, domestic generation of value-added along the full agro-food chain is low in Egypt, Morocco and Tunisia. At all stages of the chain – including agriculture production, post-harvesting, food manufacturing and processing, and consumption – the benefits in terms of employment, wages, profits and fulfilling domestic food demand are yet to be seized.

For the agro-food sector to deliver on its full social and economic potential, however, specific opportunities for young people must be developed. This includes making the sector sufficiently attractive for them in terms of number of jobs, decent working conditions and meeting their skills and aspirations. Otherwise, countries may be facing a massive exodus of young people from rural to urban areas; high levels of unemployment; heightened food insecurity; and eventually emigration.

For the agro-food sector to absorb the young labour force in productive activities, a certain vision is needed to generate attractive employment options. In turn, such vision requires strategic decisions, investments and policy actions – many of which need to be implemented already now. This report suggests four types of policy interventions to articulate such a vision:

1. Equip future young workers with the right skills to enter the agro-food labour market. This implies policies in the areas of skills development and labour, aimed at:
 - Ensuring future workers are equipped with solid foundational, cognitive, social, and emotional skills as a pre-condition for building all other skills.
 - Smoothing school-to-work transitions by investing into modern technical skills relevant for the agro-food sector delivered through TVET.
 - Integrating digital skills for agro-food professions into curricula at all levels and types of training.
 - Attracting students to tertiary education relevant to the agro-food sector.
 - Anticipating the change in skill demand and skill requirements, and raising awareness about it.

2. Support youth already on the labour market in the agro-food sector, including by:
 - Equipping young workers with the right technical skills through enterprise trainings.
 - Providing skill-upgrading possibilities through public programmes for young workers.
 - Supporting a wide range of opportunities for skill upgrading and reskilling.
 - Recognising skills and prior learning.
 - Supporting youth entrepreneurs to ensure that they succeed.
 - Leveraging the potential of agricultural advisory services.
 - Empowering women in the agro-food sector.

3. Support businesses, sustainable job creation and better working conditions to increase the attractiveness of the agro-food sector, by:
 - Improving the enabling business environment in the agro-food sector.
 - Helping small-holder businesses enhance their productivity and integrating value chains.
 - Supporting the creation of jobs, especially formal wage employment, to make jobs more attractive.
 - Improving working conditions through better labour regulations, social protection and social dialogue.

4. Ensure an even development of diverse agro-food value chains, by:
 - Channelling the development of domestic value chains and activities in non-farm employment to where they deliver the greatest socio-economic benefits.
 - Investing in larger agro-food chain projects that would otherwise remain underdeveloped.
 - Investing in infrastructure to improve rural-urban linkages.
 - Supporting the adoption of new technologies and innovation throughout the agro-food value chain.
 - Adopting necessary food safety and environmental laws and standards.

1 Introduction

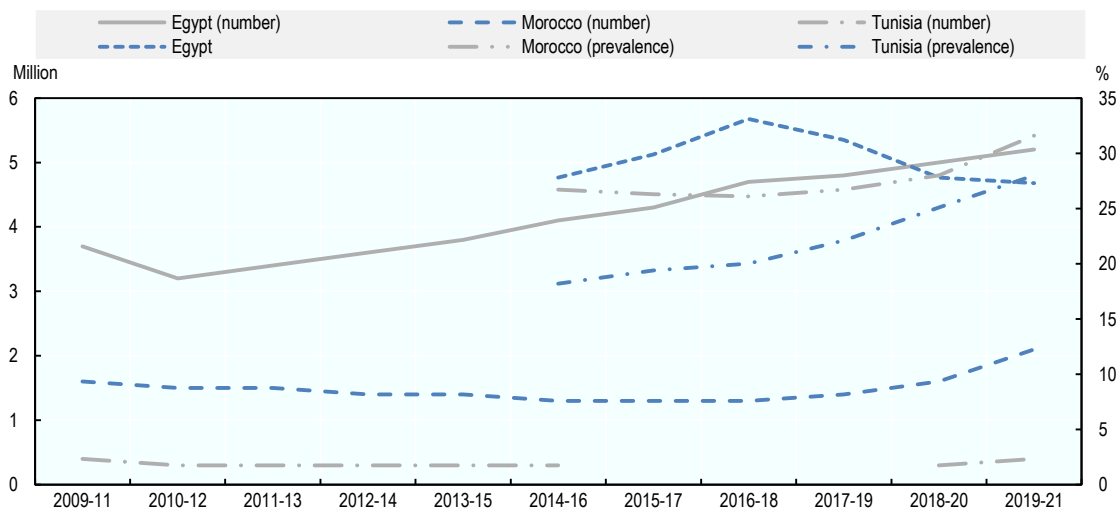
Young people represent one of the biggest assets in Middle East and North Africa (MENA) region, and especially in Egypt, Morocco and Tunisia. With the demographic transition well under way, children and young people constitute over half of the total population across MENA (55%), as opposed to only 36% across OECD countries. Between 2020 and 2035, the youth population aged 15-24 will increase by 7.7 million in Egypt, 0.8 million in Morocco and 0.4 million in Tunisia. This massive influx of youth into the labour markets calls for adapted solutions to provide them the best opportunities to participate in the economic, social and, eventually, political life. Main priorities for capturing this potential include creating quality jobs; improving productivity; investing in skills to enable the transformation of these economies, including a green transformation; strengthening public governance arrangements to ensure youth-sensitive policies and services; and mobilising the talent of more women for the economy.

The years 2020-23 have been particularly hard on MENA youth – including in Egypt, Morocco and Tunisia – who have borne unprecedented economic consequences of a series of worldwide crises. Over 2020-21, the COVID-19 crisis and its lockdown measures fragilised these countries' economies and had devastating effects on the most vulnerable populations, including young and informal economy workers (Assaad et al., 2022^[1]; Cheung et al., 2022^[2]; Krafft et al., 2022^[3]). Young people found it especially hard to enter the labour markets, as interrupted learning and training added further difficulties to transitioning to labour markets under distress. Such situations can have long-lasting scarring effects on young people, as initial experiences in the labour market have profound influences on later working life (OECD, 2010^[4]). Moreover, successful engagement of young people in the labour market and society is crucial not only for their own personal economic prospects and well-being, but also for overall economic growth and social cohesion (OECD, 2022^[5]).

Several MENA governments have taken important steps to integrate youth perspectives in elaborating their COVID-19 immediate responses. Resilience, adaptability and adequate resourcing were central to recovery strategies. Yet, recovery from the COVID-19 crisis was compromised by consecutive droughts in 2021-22 and by Russia's large-scale aggression in Ukraine since 2022. These events led to soaring world prices on many food commodities and disruption of global food value chains (OECD, 2022^[6]). In addition to inflation and labour market disruptions, these shocks put countries such as Egypt in direct danger of basic food supply shortages through the disruption of imports, and indirectly through increased prices of cereals and fertilisers on world markets (OECD, 2022^[7]). As a result, food insecurity continued to rise for a significant share of the population (Figure 1.1). One consequence is that, to ensure food security, a significant share of public budgets has been shifted to food subsidies and away from other strategic priorities, including youth programmes.

Figure 1.1. Food insecurity in selected MENA countries

Number of people undernourished (millions) and prevalence of moderate or severe food insecurity in the total population (percentage), 3-year average



Source: FAO (2023), FAOSTAT, www.fao.org/faostat/en/#data/FS.

As Egypt, Morocco and Tunisia grapple with the consequences of these crises, they also continue to face a range of longer-term structural challenges, including climate change, limited resources (especially water and land), technological developments, and urbanisation. It is increasingly clear that improving the resilience of the region's economies to such challenges should, in part, come through diversifying domestic agricultural production, improving productivity, and boosting sophistication of exports by embedding technologies and human capital. Critically, any future growth should be inclusive (OECD, 2022^[8]).

This report explores the extent to which developing the agro-food sector could be a promising contributor to solving two major problems: providing young people with productive employment; and responding to growing demand for higher quantity and quality of domestic agricultural products, while facing the challenges of optimal resource use, climate change and technological transformation. The report shows that aligning these two areas presents untapped opportunities for helping address the youth employment problem, improving the well-being of young people and their families and reaping the socio-economic benefits of the demographic dividend in the region. It would also improve food security and boost the region's resilience.

Indeed, the potential of the agro-food sector to help tackle these problems is not yet fully used. Much room still exists to improve agriculture yields and make agriculture production more profitable; decrease food waste; develop new agriculture and food products; and boost domestic value addition throughout the agro-food value chain. Seizing these opportunities can help meet evolving local demand for agricultural products, provide socio-economic benefits, enhance economic diversification, and build resilience against disruption in global food value chains.

To capture this potential, however, a certain vision is needed of the agro-food sector with the aim of creating attractive employment options for young people. Young workers in Egypt, Morocco and Tunisia are eager to live better than their parents, and aspire to better working conditions and meaningful jobs. They are also particularly responsive to the climate change, greener future, responsible consumption, and technological adoption agendas – all of which are relevant for the agro-food sector (OECD, 2022^[8]). With the right approach, the agro-food sector can become a vital vehicle for youth socio-economic empowerment in the MENA region.

The rest of this report is organised as follows. Chapter 2 describes the current and future youth potential, in terms of youth population growth, their level of skill, and their labour market outcomes. It shows how the current youth labour supply is changing in Egypt, Morocco and Tunisia as compared with other countries in the region and, where possible, OECD countries. Chapter 3 analyses current and future developments in the agro-food sector for the three countries, showing the potential for labour demand within various segments, including agriculture production; post-harvesting, storage, transportation, logistics and distribution; food manufacturing and processing; and consumption (retail sale, restaurants, and catering). Chapter 4 offers a vision as to how governments might develop policy to align labour supply and labour demand, under which conditions this will be beneficial for the region's economies, and what policy actions are needed to unleash the socio-economic potential of the sector. It shows how developing certain parts of the agro-food value chains, creating more and better jobs throughout the sector, and enhancing youth employability and skills are critical to leverage youth potential.

Finally, this report is informed by the OECD Recommendation on Creating Better Opportunities for Young People (OECD, 2022^[5]) and it resonates with previous OECD policy recommendations on youth empowerment, notably to develop measures to include youth policies in regionalisation and sector-specific policies (OCDE, 2021^[9]); to adopt “whole-of-government” approaches to support the transition of young people in the region towards autonomy (OCDE, 2021^[9]); to commit to the intergenerational justice (OECD, 2020^[10]); and to place the needs of young people at the centre of an inclusive and resilient recovery (OECD, 2022^[8]).

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2 Profiles of young people in Egypt, Morocco and Tunisia

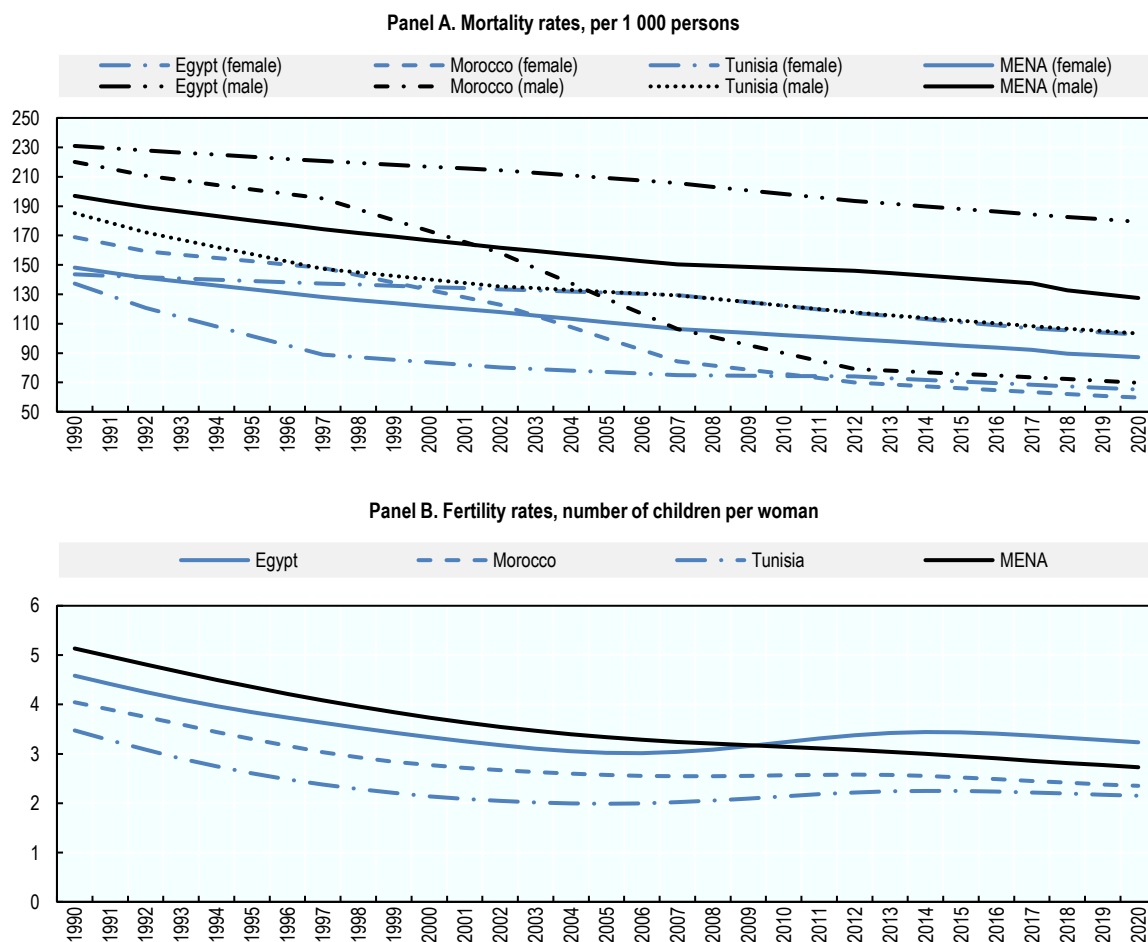
Investments in young people are needed today to leverage a demographic dividend in the next decades

MENA region is very diverse, yet most of its countries share several common features; beyond geography, history and culture, this includes similarities in demographic processes.

The proportion of prime-age population will increase significantly in MENA region over the century

The majority of MENA countries are in the midst of a demographic transition that is transformative for societies and economies. It is driven by two key factors: a steady and sure decline in mortality rates (Figure 2.1, Panel A); and a decline in fertility rates (Figure 2.1, Panel B). These trends have been observed since the 1980s, including in Egypt, Morocco and Tunisia. The decline in mortality has been particularly sharp in Morocco.

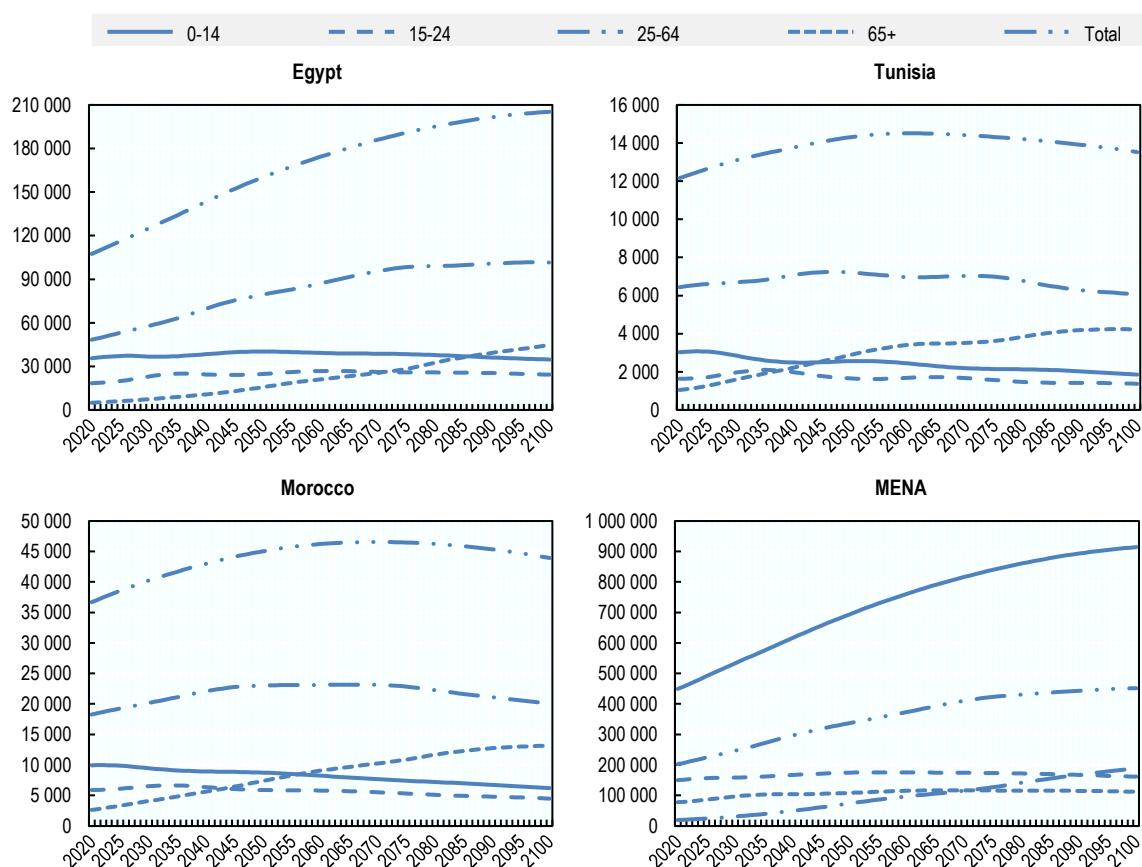
Figure 2.1. Mortality and fertility rates in MENA region, per 1 000 persons



Note: The definition of MENA in this graph corresponds to the following list of countries: Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestinian Authority, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates and Yemen.
 Source: World Bank (2023), *World Development Indicators*, <https://databank.worldbank.org/source/world-development-indicators>.

As a result of these demographic forces, most countries in the region have been experiencing a total population growth as well as growth of the working-age population, such that the latter will soon start outpacing growth of the dependent population (i.e. children under the age of 15 and people aged 65 and over) (UNICEF, 2019^[1]). This phenomenon is already evident in most countries in the Gulf Cooperation Council (GCC) and is expected to emerge in most of MENA. Between now and 2040, the dependency rates will drop as low as 50 dependents for every 100 persons of working age (15-64 years) (UNICEF, 2019^[1]) (Figure 2.2). In the coming decades, a large proportion of MENA population will advance into their most productive years (Table 2.1).

Figure 2.2. Population (both sexes combined) by selected age groups, annually for 2020-2100, in thousands



Note: MENA region in this figure is defined as the 22 members of League of Arab States organisation: Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestinian Authority, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates and Yemen.

Source: United Nations (2022), *World Population Prospects 2022*, <https://population.un.org/wpp/Download/Standard/Population/>.

This situation, referred to as the “demographic window”, will last until around mid-century. It opens the opportunity to benefit from a “demographic dividend” – expansion of the per-capita productive capacity of an economy and resulting economic growth that arise from a particularly favourable age structure and low dependency rates. The favourable age structure, however, does not translate automatically into economic growth. It emerges only if appropriate social, economic and political institutions and policies are in place to allow countries to realise the growth potential created by the demographic window (Bloom and Williamson, 1998^[2]). Among others, these policies include investment in the human capital of today’s children, adolescents and young people (i.e. future workers) and even ensuring they are healthy and well-nourished. Other policies should aim to improve productive absorption by the labour market of the growing working age population and to reinforce the positive cycle of advancing health, education and employment opportunities.

As the populations will age, the dependency rates will rise again – driven by the old age dependency – in the second half of the century, causing the demographic window of opportunity for demographic dividend to start closing (UNICEF, 2019^[1]). This demographic prospect urges investment in today’s young people to benefit from a higher demographical dividend in the next decades and prepare for sustaining older generations later.

Table 2.1. Median population age in MENA countries, 2020-70 (projection)

Country	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Kuwait	37.2	41.3	44.7	47.4	48.2	46.2	45.7	46.3	47.3	48.1	47.7
Tunisia	31.4	33.0	34.7	36.1	36.9	37.8	38.8	40.3	41.9	43.4	44.4
Saudi Arabia	29.2	31.5	33.4	34.8	36.2	37.4	38.8	40.3	41.4	42.5	43.2
Bahrain	31.9	34.2	34.8	34.8	34.9	35.6	36.4	37.3	37.9	38.0	37.9
Lebanon	28.0	29.8	32.0	32.7	32.9	34.2	36.3	38.7	40.9	42.5	43.5
Morocco	28.4	29.9	31.2	32.5	33.8	35.1	36.6	38.2	39.6	40.9	42.0
United Arab Emirates	32.0	33.9	34.5	35.0	35.0	35.1	35.6	35.9	36.2	36.2	35.9
Qatar	32.0	34.2	34.8	34.8	34.2	34.4	34.8	35.2	35.3	35.1	34.8
Libya	26.1	27.4	29.0	30.7	32.5	34.3	36.0	37.6	38.9	39.9	40.7
Algeria	27.6	28.7	29.5	30.2	31.4	32.8	34.5	36.3	38.1	39.5	40.5
Oman	28.8	29.7	30.9	31.3	31.8	32.7	34.0	35.5	36.7	37.6	38.1
Jordan	23.1	24.6	26.2	27.8	29.5	31.3	32.9	34.4	35.8	37.1	38.5
Syria	20.4	23.4	25.7	27.8	29.9	31.9	32.9	33.1	34.1	35.6	37.4
Egypt	23.8	24.5	25.4	26.3	27.5	29.0	30.3	31.5	32.5	33.5	34.5
Palestinian Authority	19.0	20.1	21.4	22.8	24.4	26.0	27.5	29.0	30.6	32.1	33.6
Iraq	19.6	20.7	21.9	23.2	24.6	25.9	27.0	28.1	29.2	30.4	31.6
Yemen	18.5	19.5	20.8	22.2	23.7	25.2	26.7	28.1	29.5	30.8	32.1
Mauritania	17.4	18.3	19.4	20.6	21.6	22.6	23.8	25.0	26.2	27.4	28.6

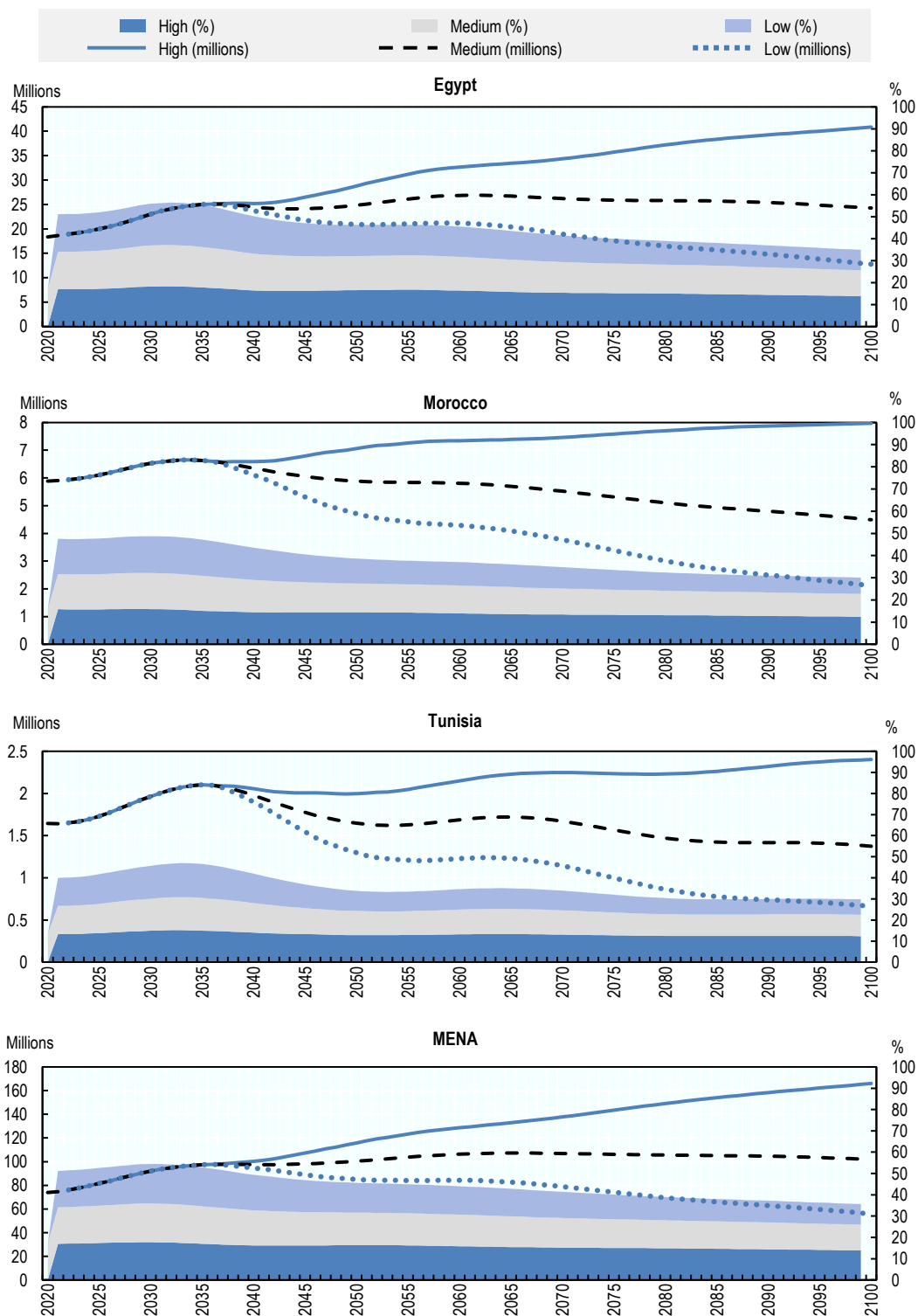
Note: Data for 2020-21 are estimates; those for 2022-70 are the medium fertility variant of projections. Blue = higher values of indicator; grey = lower values. The intensity of shading reflects the distance from the midpoint, with darker shades indicating values farther away from the 50th percentile. The medium fertility variant of projections corresponds to the median of several thousand distinct trajectories of each demographic component derived using the probabilistic model of the variability in changes over time.

Source: United Nations (2022), *World Population Prospects 2022*, <https://population.un.org/wpp/>.

Between now and approximately 2040, MENA region will experience an increasing number of young people aged 15-24

Between 2020 and 2025, MENA will see an increase in the number of young people from approximately 74 million to 81.5 million. This is a result of the ageing (and surviving beyond infancy) of a particularly high number of children born two decades earlier. The highest quinquennial increases are projected for 2030 (92 million) and 2035 (97 million). The number of young people in MENA will continue to increase beyond 2040 (Figure 2.3), although the rates of growth will slow thereafter. Among Egypt, Morocco and Tunisia, the latter two countries will show the steepest declines in the growth rates of youth. Still, between 2020 and 2035, the youth population will increase by 0.8 million in Morocco, by 0.4 million in Tunisia as compared with 7.7 million in Egypt (United Nations Department of Economic and Social Affairs Population Division, 2022^[3]). A relative rebound in fertility rates in Egypt after 2060 will continue sustaining the youth growth rate two decades later. This massive influx of additional young people into the labour markets in the next decade begs for adapted solutions for skill development and for labour market integration policies.

Figure 2.3. Youth (15-24) population growth prospects over the 21st century



Note: MENA region in this figure is defined as following: Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestinian Authority, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates and Yemen. The high and low fertility scenarios differ from the medium scenario in the projected level of total fertility. In the high scenario, total fertility is projected to reach a fertility level that is 0.5 births above the total fertility in the medium scenario. In the low scenario, total fertility is projected to remain 0.5 births below the total fertility in the medium scenario.

Source: United Nations (2022), *World Population Prospects 2022*, <https://population.un.org/wpp/>.

Rural population in MENA region will continue to have an important weight, though differences among countries will subside

Between 2010 and 2020, total rural population of MENA region increased by over 20 million. This increase, however, was driven only by a handful of countries, and mainly Egypt, which witnessed the increase of rural population by almost 11 million over this period (Table 2.2).

Table 2.2. Annual rural population at mid-year across selected MENA countries, 2010-2050

Country	2010	2015	2020	2025	2030	2035	2040	2045	2050	2010-50
Egypt	47 925	53 655	58 900	63 043	66 132	68 276	69 335	69 136	68 113	20 188
Sudan	23 008	25 548	28 192	30 779	33 067	34 907	36 363	37 441	38 124	15 116
Yemen	16 106	17 556	18 780	19 759	20 485	20 955	21 153	21 058	20 674	4 568
Iraq	9 505	10 863	12 080	13 161	14 090	14 836	15 370	15 716	15 931	6 426
Morocco	13 606	13 640	13 519	13 232	12 805	12 280	11 696	11 072	10 402	-3 204
Algeria	11 724	11 623	11 382	11 016	10 590	10 189	9 782	9 358	8 905	-2 819
Syria	9 332	8 961	8 426	9 675	10 185	10 228	10 090	9 871	9 546	214
Saudi Arabia	4 914	5 308	5 454	5 448	5 337	5 147	4 899	4 630	4 348	-566
Tunisia	3 548	3 601	3 622	3 578	3 469	3 313	3 130	2 939	2 745	-803
Palestinian Authority	1 051	1 149	1 239	1 314	1 368	1 399	1 415	1 419	1 412	361
United Arab Emirates	1 316	1 311	1 271	1 228	1 189	1 151	1 108	1 059	1 005	-311
Libya	1 354	1 292	1 286	1 251	1 202	1 143	1 079	1 011	940	-414
Jordan	999	892	876	808	758	728	710	693	669	-330
Oman	755	783	707	582	490	425	387	366	347	-408
Lebanon	549	696	667	573	504	460	427	393	360	-189
Bahrain	141	151	178	184	185	181	174	167	158	17
Qatar	27	26	21	18	15	13	12	12	11	-16
Kuwait	0	0	0	0	0	0	0	0	0	0
Total	145 860	157 055	166 600	175 649	181 871	185 631	187 130	186 341	183 690	37 830
5Y-Delta		11 195	9 545	9 049	6 222	3 760	1 499	-789	-2 651	

Note: Blue = higher values of indicator; grey = lower values.

Higher values of indicator are highlighted with blue colour while the lower values are highlighted with grey colour. The intensity of shading reflects the distance from the midpoint, with darker shades indicating values farther away from the 50th percentile.

Source: United Nations (2018), *World Urbanization Prospects 2018*, <https://population.un.org/wup/DataQuery/>.

Indeed, most MENA countries show an increasing pace of urbanisation. Already by 2010, all MENA countries were predominately urban, with the highest urbanisation observed in Kuwait and Qatar. Even though such urbanisation trends will continue over the coming decades, by 2050, 44% of Egypt's population will still live in rural areas (UNICEF, 2019_[1]) and shares at the turn of the century will remain significant in Tunisia (20%) and Morocco (23%), despite declines. This suggests an important scope and need to develop rural economies, with the view of raising living standards and improving livelihoods of rural populations.

Equipping children with adequate education and skills remains both a key priority and a substantial challenge

Several countries, including Egypt, Morocco and Tunisia, significantly improved school enrolment over recent decades

In 2022, every fourth person in MENA region was aged between 10-24 years old. By 2035, the share of this age group in total population will increase from 16.7% to 19.0% in Egypt and from 13.6% to 15.3% in Tunisia. It will slightly decrease from 15.8% to 15.6% in Morocco. While the economic gains from the demographic changes are yet to be observed, as these adolescents and young people are preparing to enter the labour market, to leverage their potential, they need to be equipped with the right education and skills.

Several MENA countries have made tremendous progress towards improving the quantity of schooling and access to schools, measured jointly by gross school enrolment rates (Table 2.3). Egypt, Morocco and Tunisia were at the forefront of these developments, especially as concerns enrolment into primary and secondary education.

Table 2.3. Gross school enrolment rates across selected MENA countries, 2010-20

School enrolment, primary (% gross)											
Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
OECD average	104.1	103.7	103.3	103.7	103.0	102.7	102.7	102.3	102.1	102.0	101.3
Algeria	115.3	116.6	118.1	119.5	118.5	115.9	113.8	111.8	109.9	108.8	111.3
Tunisia	107.2	107.8	109.9	111.4	113.3	114.6	114.9	115.6	115.4		113.4
Syria	116.8	121.6	128.5	81.7							
Morocco	109.7	110.7	110.7	110.3	110.0	109.5	110.4	112.4	113.9	114.8	115.2
Saudi Arabia	106.6	106.6	110.1	116.4	119.0	110.4	105.1	99.5	99.8	100.7	100.2
Oman		102.6	104.6	109.1	109.7	108.3	108.3	106.4	103.4	102.9	104.5
Egypt	102.3	99.2	104.8	105.1	103.9		105.4	106.1	106.3	106.4	
Qatar	102.6	103.9	101.3	97.6	99.1	102.6	103.0	103.3	103.8	103.5	103.9
Mauritania	99.7	98.2	98.9	99.0	100.4	104.5	96.8	96.7	99.9	100.4	
Kuwait	102.2	105.6	105.0	104.0	103.8	102.6	100.5	95.7	92.4	88.0	87.3
Bahrain		94.9	95.3	97.7	99.7	101.2	101.1	101.2	99.4	98.0	
Palestinian Authority	91.3	93.1	95.8	96.4	97.7	97.5	97.5	98.9	98.6	97.7	96.4
Yemen	91.7	95.7	95.1	98.2			93.6				
Jordan	81.9	79.3	76.5	75.4	79.5		78.6	80.8	81.5	81.8	80.4
Sudan	71.7	69.5	70.9	72.0	72.3	73.1	75.9	76.8	79.0		
School enrolment, secondary (% gross)											
OECD average	98.8	99.1	98.9	103.1	103.9	104.6	105.2	106.0	105.6	105.7	105.4
Saudi Arabia						116.5	112.3	107.7	110.1	111.8	112.6
Qatar	105.5										
Oman		99.6	100	99.5		103.3	107.6	105.8	106.7	107.1	107.1

Algeria	96.9	99.6									
Bahrain	92.9	95.3	91.7	96.7	98.9	102.2	103.9	102.2	98.6	97.1	
Kuwait	97.9	97.1	96.4	95.1	93.9	97.8					
Tunisia	90.2	91.8		90.1	87.7	88.2	92.9				
Palestinian Authority	85.7	84.2	83.9	84	84.4	85.8	87	88.9	89.5	90.7	91
Egypt	68.9	77.6	78.7	80.3	80.8		85.1	86.7	87.9	89.5	
Morocco	63.3	66.5	69.7					79.9	80.2	81.2	82.5
Jordan	80.1	77.6	74.2	71.1	69.1			62.6	63.1	65.2	67.8
Syria	72.2	74.5	77.9	52.5							
Yemen	44.1	46.2	46.9	49.3			51.6				
Sudan	42.5	37.6	41.2	43.6	44.9	45.6	44.1	46.6	45.9		
Mauritania	20.8	22.9	27.3	30.1	30.7	31.4	32.7	32.6	36.8	39.4	

School enrolment, tertiary (% gross)

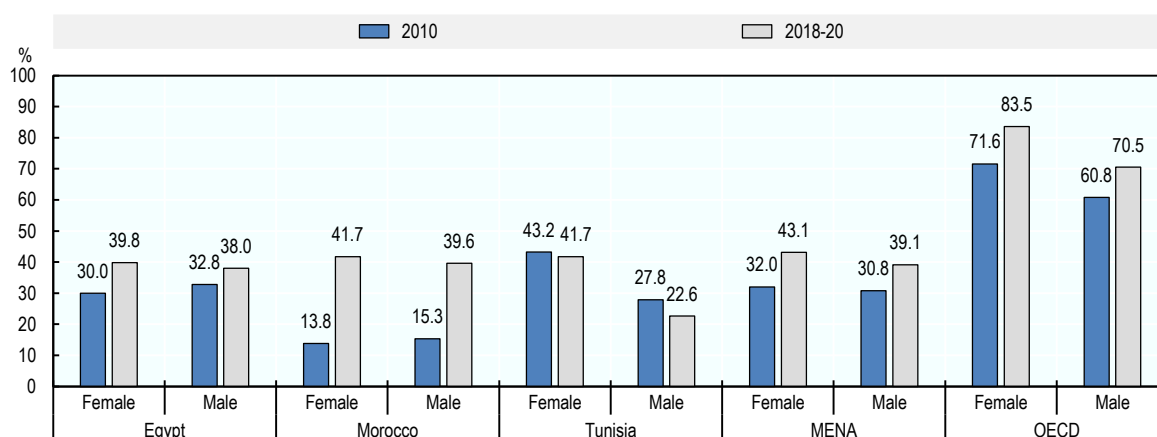
OECD average	66.1	67.4	68.6	69.6	70.6	71.6	73.6	74.6	75.5	76.9	78.0
Saudi Arabia	36.6	40.4	46.7	52.2	58.3	61.1	67.3	69.7	68.0	70.9	70.6
Kuwait					51.0	55.1	57.3	55.4	54.4	55.3	61.1
Bahrain		44.0	43.2	39.5	41.3	43.3	46.6	47.1	50.5	55.6	60.3
Palestinian Authority	47.8	49.7	48.5	45.9	44.8	45.3	43.9	43.7	44.3	43.2	43.1
Algeria	29.9	31.2	32.2	33.9	34.5	36.8	42.6	47.6	51.4	52.6	52.5
Oman	23.3	27.0		29.9	34.6	39.2	44.1	38.1	38.0	40.4	45.5
Jordan	37.1	36.3	41.8			36.6	35.6	31.1	34.4	33.1	33.6
Syria	25.9	25.8	30.9	32.8	41.6	42.7	40.1			43.0	
Tunisia	35.4	35.2	35.9	35.0	35.3	35.2	32.8	32.1	31.7	31.8	
Egypt	31.4	26.8	27.7	30.1	31.1	35.0	33.9	35.2	38.9		
Morocco	14.6	16.4	19.5	22.6	25.3	28.4	32.0	33.8	35.9	38.5	40.6
Sudan	15.9	15.5	15.7	17.7	16.9	16.9					
Qatar	9.4	11.1	10.9	12.0	13.6	14.7	15.6	16.6	17.9	18.9	20.8
Yemen	10.8	10.2									
Mauritania	4.4	4.7	5.1	5.4		5.6	5.4	5.0	5.0	5.8	5.9

Note: Blue = higher values of indicator; grey = lower values. The intensity of shading reflects the distance from the midpoint, with darker shades indicating values farther away from the 50th percentile.

Source: World Bank (2022), *World Development Indicators*, <https://databank.worldbank.org/source/world-development-indicators>.

Even though enrolment in tertiary education in the region overall – and in Egypt, Morocco and Tunisia specifically – remains well below the OECD average, it substantially increased in Egypt and Morocco over the last decade. Particularly notable gains were achieved for women (Figure 2.4). Between 2010 and 2020, gross school enrolment in tertiary education in Morocco increased from 13.8% to 41.7% for females and from 15.3% to 39.6% for males. Though somewhat lower, Egypt still showed substantial gains: from 30.0% to 39.8% for females and from 32.8% to 38% for males. In contrast, enrolment in tertiary education slightly declined in Tunisia. Young people in these countries today are more educated as compared with their parents, including women residing in rural areas (OECD, 2021^[4]).

Figure 2.4. School gross enrolment in tertiary education level



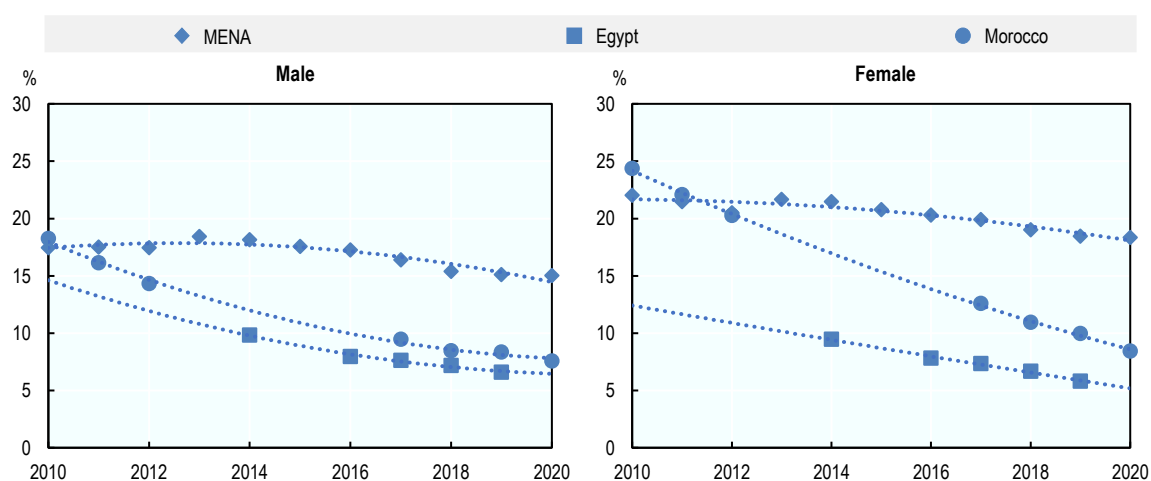
Note: Data for Tunisia are from 2019 and data for Egypt are from 2018.

Source: World Bank (2022), *World Development Indicators*, <https://databank.worldbank.org/source/world-development-indicators>.

Despite this progress, much room for improvement exists in both the quantity and quality of schooling

Since the turn of the century, significant improvements have been observed in the educational landscape of several MENA countries. In Egypt and Morocco, there has been a remarkable decline in the number of out-of-school children (Figure 2.5), including for primary school-age children, adolescents of lower secondary age and young people of upper secondary age (Table 2.4). Tunisia has made progress in reducing the number of out-of-school children as well. The data shows a decline for out-of-school children of primary-school age (Table 2.4), though no data for other age groups are available. These trends demonstrate commendable efforts and achievements in enhancing access to education in Egypt, Morocco, and Tunisia. As a result of these efforts, secondary school enrolment in 2020 stood at 82.5% in Morocco, while both Egypt and Tunisia achieved about 90%.

Figure 2.5. Out-of-school rate for primary, lower secondary and upper secondary school age, by sex



Note: MENA region in this figure is defined as the list of 22 members of League of Arab States organisation (Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestinian Authority, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates and Yemen).

Source: UNESCO (2022), UNESCO Institute for Statistics, <http://data.uis.unesco.org/>.

Table 2.4. Out-of-school young people by country and age group

Last available data

		Primary age		Lower secondary age		Upper secondary age	
		2011	2019	2014	2019	2014	2019
Egypt	Year						
	Number of young people	399 800	90 600	546 500	127 800	1 423 000	1 209 000
Morocco	Year	2011	2020	2011	2021	2011	2020
	Number of young people	205 200	17 600	351 900	131 000	893 000	453 000
Tunisia	Year	2011	2020				
	Number of young people	11 200	9 000	n/a	n/a	n/a	n/a

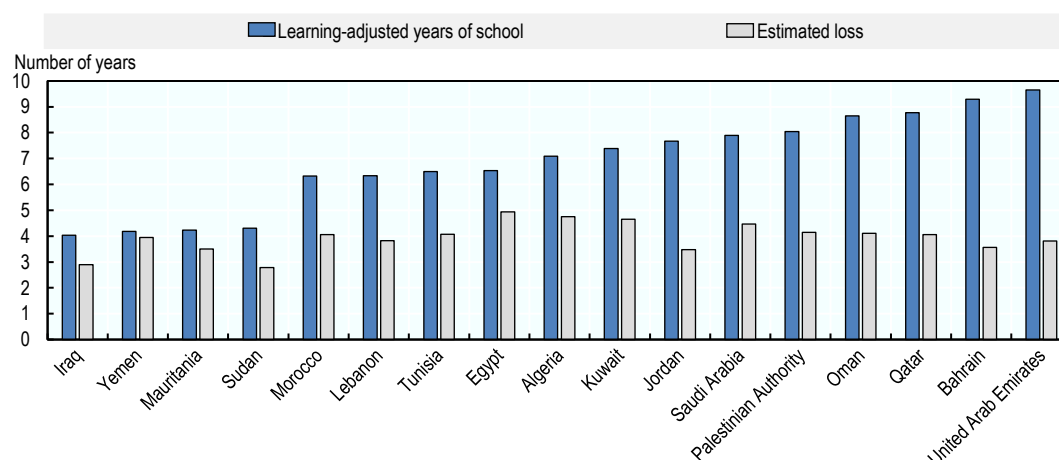
Source: UIS (2022), *Data for the Sustainable Development Goals*, http://uis.unesco.org/en/home#tabs-0-uis_home_top_menus-3.

Despite these significant efforts to improve school enrolment, many children of school age are still out of school. Numerous reasons are linked to school drop-outs, including the quality of schooling and grade repetition, but also child marriage and child labour (which can be both cause and consequence of early school drop-out). Access to school, the rate of school dropouts, and the reasons for drop-out also remain unequal for boys and girls. Out-of-school girls remain at a high risk of child marriage, while boys are at a risk of child labour, as they have to engage into paid activities to help their families (UNICEF, 2015^[5]). Persisting dropout rates in the region are also explained by ongoing security issues, lack of appropriate programmes, facilities, and transport, and low levels of educational and family support (EFT, 2021^[6]).

The COVID-19 pandemic has put at risk recent efforts to prevent school dropouts in MENA. School closures, especially over the year 2020, had compound effects on the higher dropout rates of children and students from the most disadvantaged backgrounds, especially those living in rural areas and not having access to digital technologies and internet – and particularly of girls (UNESCO, 2022^[7]; UNESCO, 2020^[8]; OECD, 2020^[9]).

In addition to quantity, the quality of formal education remains uneven in MENA, with many pupils not properly acquiring even the basic skills and competencies. The poor quality of compulsory schooling prevents students from maximising their learning and limits their future productive potential while also contributing to higher dropout rates. An average 6-year-old child in the region can expect to attend school for 10.8 years (from 6.9 years in Iraq to 13.5 years in United Arab Emirates); adjusted for quality, this amounts to 6.9 years (Figure 2.6). On this adjusted measure, Egypt (6.5 years), Tunisia (6.5) and Morocco (6.3) outperform some regional peers such as Sudan (4.3 years), Mauritania (4.2 years), Yemen (4.2 years), or Iraq (4.0 years). As they fail, however, to match the regional average (6.9 years), it remains critical to boost the quality of schooling in these countries.

Figure 2.6. Quality of schooling in 2020



Note: The estimated loss is the difference between the expected number of years of school (given enrolment ratios at successive ages) and the learning-adjusted years of school (incorporating test scores).

Source: World Bank (2020), *Human Capital Index 2020 database*, <https://databank.worldbank.org/source/human-capital-index>.

The quality of schooling can be further inferred from the international assessments of learning outcomes, such as Progress in International Reading Literacy Study (PIRLS) and Trends in International Mathematics and Science Study (TIMSS) (Mullis et al., 2020^[10]; Mullis et al., 2017^[11]). PIRLS and TIMSS are international assessments that monitor trends in student achievement in mathematics, science and reading, which have conducted at regular intervals in 70 countries since 1995. The PIRLS reading achievement scale has a typical range of achievement between 300 and 700. In 2001, a centrepoint of 500 was set to correspond to the mean of overall achievement, with 100 points set to correspond to the standard deviation. At present, all participating MENA countries are below the centrepoint. Across all countries in the region, female grade 4 pupils perform better than male, with Morocco showing the lowest gender gap in reading achievement (28 points, with 372 for girls and 344 for boys). Egypt shows a wider gender difference (37 points, with 349 for girls and 312 for boys). Of those children who are in school, only half meet the lowest benchmark for measuring skills in reading, mathematics and science.

The Programme for International Student Assessment (PISA) is another means to measure the quality of learnt material. PISA results for Morocco and Tunisia show comparable education quality while also highlighting room for improvement (Box 2.1).

Box 2.1. PISA results for Morocco and Tunisia

PISA is a triennial survey of 15-year-old students across the world, which assesses the extent to which they have acquired the key knowledge and skills essential for full participation in society. The assessment focuses on proficiency in reading, mathematics, science, and an innovative domain, and on student well-being.

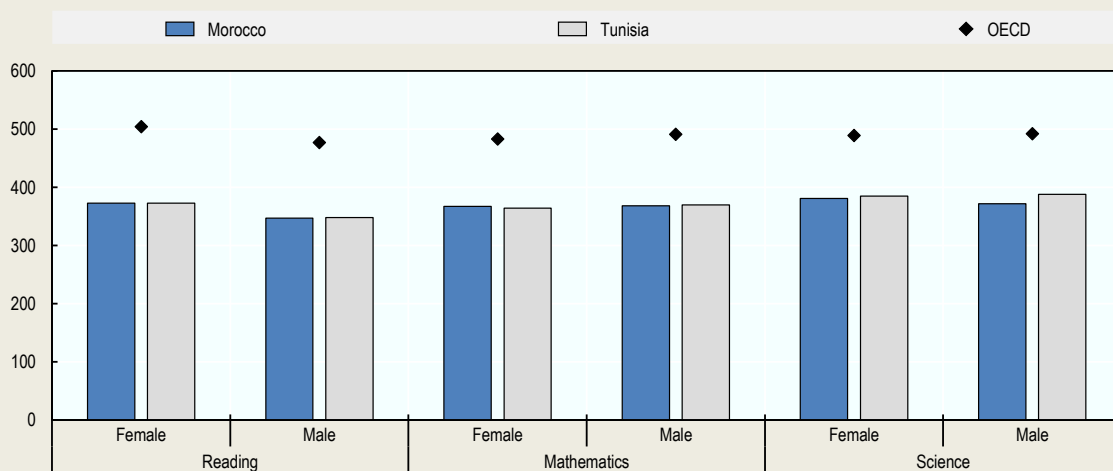
Results from the PISA survey conducted in Morocco in 2018 showed that students scored lower than the OECD average in reading, mathematics and science (Figure 2.7). Compared to the OECD average, a smaller proportion of students in Morocco performed at the highest levels of proficiency (Level 5 or 6) in at least one subject. Similarly, a smaller proportion of students achieved a minimum level of proficiency (Level 2 or higher) in at least one subject.

In reading, 27% of pupils in Morocco attained at least Level 2 proficiency (OECD average: 77%). At a minimum, these students can identify the main idea in a text of moderate length; find information based on explicit, though sometimes complex criteria; and reflect on the purpose and form of texts when explicitly directed to do so.

In mathematics, some 24% of Moroccan pupils attained Level 2 or higher (OECD average: 76%). At a minimum, these students can interpret and recognise, without direct instructions, how a (simple) situation can be represented mathematically.

In science, some 31% of pupils attained Level 2 or higher (OECD average: 78%). At a minimum, these students can recognise the correct explanation for familiar scientific phenomena and can use such knowledge to identify, in simple cases, whether a conclusion is valid based on the data provided.

Figure 2.7. PISA overall averages for age 15 years on reading, mathematics and science scale



Note: The Reading, Mathematics and Science scale ranges from 0 to 1 000. Some apparent differences between estimates may not be statistically significant. Morocco = 2018; Tunisia = 2015; OECD average = 2018.

Source: OECD (2023), *Programme for International Student Assessment*, www.oecd.org/pisa/publications/pisa-2018-results.htm.

Still in Morocco, girls scored similar to boys in mathematics and outperformed boys in science by nine score points (two across the OECD countries).

Socio-economic status was a strong predictor of performance in mathematics and science.

One explanation for lagging in school quality is greater shortages of both staff and material as compared to the OECD average. Also, there is a higher share of teachers (45%) with less than five years of professional experience in disadvantaged schools as compared to advantaged schools (16%).

In Tunisia, available results from the 2015 survey suggest that pupils fared similarly to those in Morocco in terms of average scores (Figure 2.7). Girls fared somewhat better than boys in both reading and in mathematics and science. In all subjects, however, their scores were below the OECD average (Figure 2.7). Importantly, no progress in overall results was observed since 2006 (OECD, 2021^[12]).

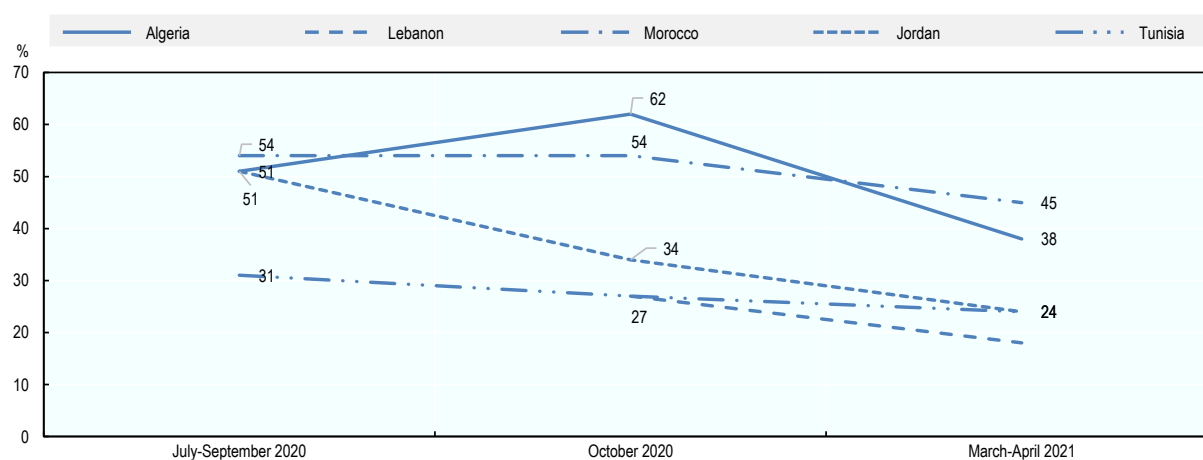
Note: Authors' elaboration based on OECD (2018), Country Note, Programme for International Student Assessment (PISA), Results from PISA 2018 www.oecd.org/pisa/publications/PISA2018_CN_MAR.pdf, and PISA database, available at: <https://pisadataexplorer.oecd.org/ide/idepisa/report.aspx>.

Source: Authors' elaboration.

The COVID-19 pandemic also had a deteriorating effect on the quality of delivered materials. Despite government efforts to provide adapted responses, the situation left many pupils and parents concerned. Children in rural areas, with poor access to computers and to internet connections, were particularly affected. Surveyed youth organisations based in MENA countries expressed strong concerns about the impact of COVID-19 on education, employment and mental health of young people (OECD, 2020^[9]). According to Arab Barometer, citizens in several MENA countries grew more dissatisfied with the education systems during the pandemic. By March 2021, less than half of the population in all surveyed countries reported being satisfied; in Tunisia and Jordan, the satisfaction level fell to less than one-third (Figure 2.8).

Figure 2.8. Satisfaction with education systems in selected MENA countries

Percentage of individuals saying that they are completely satisfied or satisfied

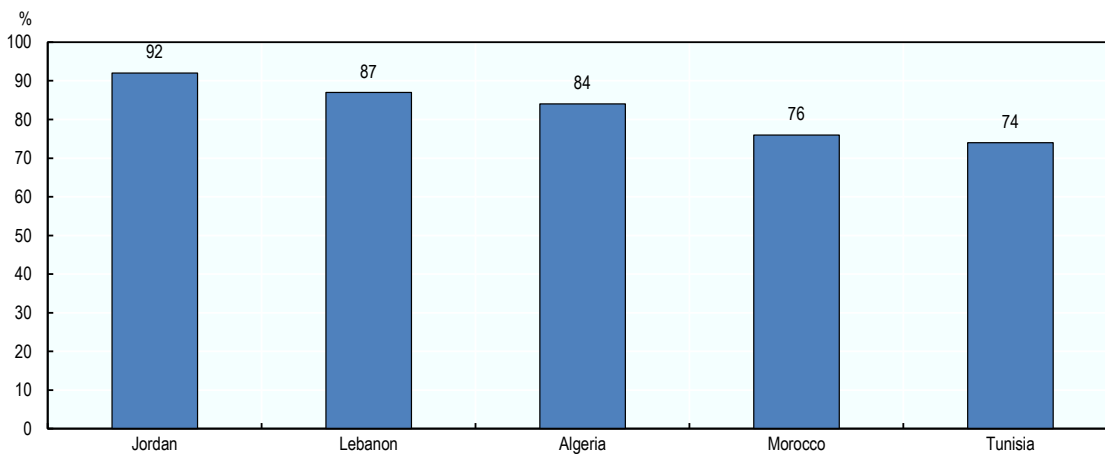


Source: Arab Barometer (2022), <https://www.arabbarometer.org/2022/01/what-arabs-think-about-education-during-the-covid-pandemic/>.

Over 75% of the population in the surveyed MENA countries said that the COVID-19 pandemic extremely or moderately impacted their children's education, though it is worth noting that Morocco and Tunisia scored best as compared to their neighbours (Figure 2.9). Given that improving education outcomes was already a priority for Egypt, Morocco and Tunisia before the pandemic, additional efforts need to be dedicated to ensuring the recovery and future progress in learning outcomes.

Figure 2.9. Impact of COVID-19 on children's education in 2020 for selected MENA countries

Share of children extremely or moderately negatively affected, according to parents' assessments



Note: The survey period is July to October 2020

Source: Arab Barometer (2022), www.arabbarometer.org/2022/01/what-arabs-think-about-education-during-the-covid-pandemic/.

A need exists to better equip students with skills immediately relevant for the labour markets

Beyond providing access to primary and secondary schools, and ensuring the acquisition of high-quality fundamental knowledge, educational systems should also prepare young people for the demands of the labour markets. In this regard, scope exists to further develop high-quality relevant technical and vocational education and training (TVET) systems and apprenticeships. TVET programmes usually include work-based learning, continuing training and professional development that may lead to qualifications. Learning to learn, and the development of literacy, numeracy and digital skills – as well as transversal skills and citizenship skills – are integral components of TVET (UNESCO, 2016^[13]).

Throughout the MENA region, current participation rates in formal TVET structures at secondary, post-secondary and tertiary levels are low and often perceived as low status (Álvarez-Galván, 2015^[14]). This often reflects a lack of resources devoted to these structures, low quality of delivered training, programmes being poorly adapted to the needs of the labour markets, and insufficient choice of field of study relevant to the career preferences of students (UNESCO, 2021^[15]; Alam and De Diego, 2019^[16]).

In addition, gender stereotypes persist in the region regarding the choice of specialisations, with social norms exerting a strong influence on students' choices of “appropriate” activities – even if such choices do not adequately prepare young people for the job market (OECD, 2021^[17]).

For TVET systems to provide the necessary agility to adjust to changing labour market demands, it is important to broaden the qualification profiles and integrate core work skills into the curricula. Such measures could improve the employability of young people while also increasing the potential to further upgrade initial qualifications (ILO, 2018^[18]). Engaging employers in providing on-the-job training is vital to help ensure young people are equipped with the relevant skills and familiar with using the latest tools and technologies.

Many TVET programmes faced challenges during the COVID-19 pandemic due to their work-based component and the inability to deliver practical education while businesses were closed (OECD, 2021^[19]). Education and training institutions, as well as their students and trainees, increasingly adopted a wide range of education technologies to mitigate the impact of the closures of learning institutions. Again, the availability of remote learning – and the possibility of learners to join it – varied greatly across sectors of

activity, occupations, places of residence – with the most vulnerable learners being excluded from these possibilities.

Dual apprenticeship systems are another to enable young people to make the transition from education to the world of work. By allowing young people to simultaneously acquire relevant skills and work experience, such systems can be an important vehicle to enhance employability of young people. Establishing appropriate systems requires substantial joint effort on the part of governments, employer associations, trade unions and training providers (ILO, 2017^[20]).

School-to-work transition remains challenging, especially for young women

Young people in MENA region seem to have a more difficult time, compared with their peers in other parts of the world, in transiting from school into the labour market. In reality, many economies in the region simply do not generate enough jobs for everyone and are not catching up with the large annual influx of new young workers – especially a large influx of highly educated new workers including women (Dimova, Elder and Stephan, 2016^[21]).

The shares of NEET in MENA countries are above global averages and particularly high for young women

Except for Qatar, Saudi Arabia, Algeria and United Arab Emirates, the share of young people not in employment, education or training (NEET) is higher in MENA countries than the world average of 23.3% (Table 2.5). Egypt (28.8%), Morocco (29.9%) and Tunisia (28.5%) are all close to region's average (31.5%). Since 2010, the proportion of youth NEET increased for both young women and men across the region, and was exacerbated by the COVID-19 pandemic. The growing share of these individuals is a concern, as they are neither gaining experience in the labour market, nor receiving income from work, nor enhancing their education and skills – although some may be contributing to the economy through unpaid work, which is particularly true of young women. This form of labour underutilisation in the early stages of a young person's career can lead to several scarring effects, including lower employment and earnings prospects decades later.

Table 2.5. Share of youth NEET, selected countries in MENA, percentage

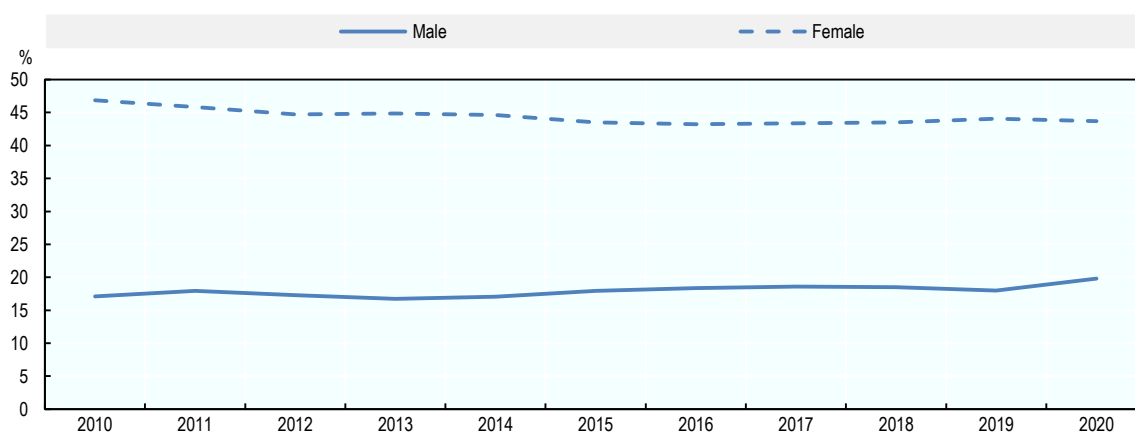
Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Iraq	42.9	41.8	40.6	40.9	41.2	42.1	42.9	44.4	44.5	44.6	45.4
Yemen	42.8	43.2	43.8	44.0	44.8	44.8	44.8	44.8	44.9	44.9	45.4
Jordan	32.5	33.4	32.5	33.6	33.5	35.1	37.0	38.1	36.5	36.0	37.4
Mauritania	38.6	39.3	39.5	38.5	37.7	36.6	36.3	35.5	35.0	34.7	35.2
Palestinian Authority	29.3	27.5	30.0	31.4	32.2	32.2	32.4	33.2	33.5	33.4	34.5
Libya	33.9	34.1	33.5	33.6	33.8	33.9	34.1	34.3	34.2	34.2	34.4
Syria	28.5	28.1	26.7	32.0	31.8	31.9	32.2	32.4	32.4	32.3	33.7
Sudan	30.6	32.8	32.3	31.7	31.9	31.9	32.1	31.9	32.1	32.3	33.5
Morocco	29.3	29.2	28.8	28.8	28.9	29.1	29.1	29.0	28.7	28.4	29.9
Kuwait	25.7	25.7	25.6	25.9	26.3	26.3	26.3	27.1	27.5	27.8	29.7
Egypt	33.1	32.1	31.6	28.4	27.4	27.6	27.6	26.9	27.1	28.0	28.8
Tunisia	25.2	28.8	26.4	25.9	26.6	27.6	26.8	27.2	27.5	27.4	28.5
Oman	26.8	26.5	25.6	25.3	25.1	25.1	24.3	24.3	23.6	23.7	27.3
Lebanon	20.6	20.9	21.1	21.4	21.7	21.9	22.3	22.8	23.2	23.5	25.0
Bahrain	23.4	23.5	23.2	22.9	22.5	22.0	21.9	22.2	22.3	22.3	24.2
United Arab Emirates	20.9	20.8	20.3	20.3	20.0	19.1	19.2	20.3	20.1	19.5	21.9
Algeria	24.5	26.0	22.7	21.5	22.8	21.2	20.6	21.0	20.6	20.5	21.7
Saudi Arabia	19.6	20.6	18.8	18.4	18.3	16.1	16.1	17.0	17.2	16.5	16.2
Qatar	9.8	9.8	9.9	10.0	9.9	9.8	9.8	10.0	10.0	10.1	10.9
OECD Average	16.1	15.9	15.1	16.1	15.7	15.2	14.8	13.9	13.4	12.9	13.7
World	22.1	22.0	21.8	21.9	21.7	21.8	21.9	22.0	22.0	21.8	23.3

Note: ILO modelled estimates. Blue = higher values of indicator; grey = lower values. High values of indicator are highlighted with light blue colour while the lower values are highlighted with dark blue colour.

Source: ILO (2022), ILOSTAT, <https://ilostat.ilo.org/data/>; OECD (2023), *Youth not in employment, education, or training (NEET) (indicator)*.

Due to a complex set of interrelated social, cultural, historical, legal and economic factors (OECD, 2017^[22]), almost a half of all young women in MENA are likely to be in NEET (Figure 2.10) – i.e. 2.5 times more likely than young men (ILO, 2022^[23]).

Figure 2.10. ILO modelled estimates of share of NEET youth by gender in MENA region



Note: ILO modelled estimates. In this figure, MENA region includes the following countries: Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates and Yemen.

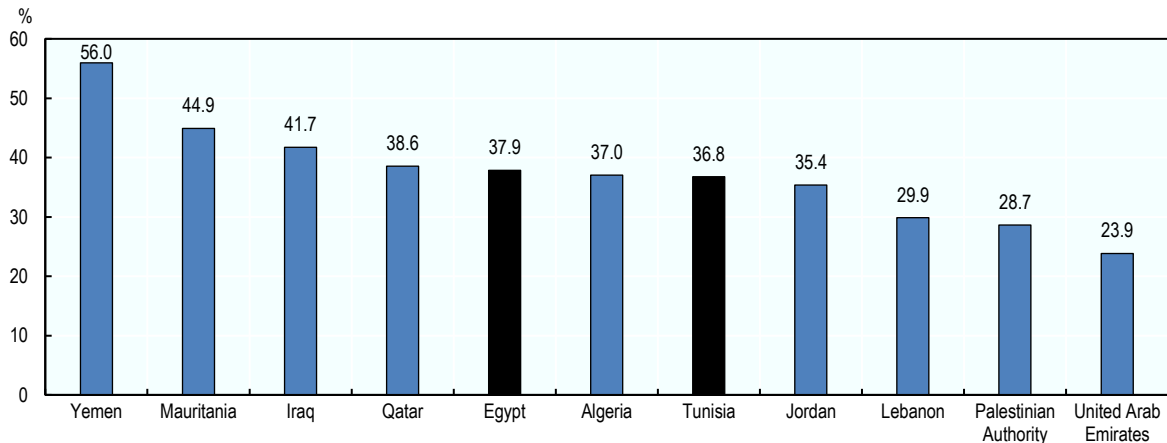
Source: ILO (2022), ILOSTAT, <https://ilostat.ilo.org/data/>.

Labour market transitions are long and uncertain, especially for young women, discouraging young people from work

The high share of NEET individuals indicates that some will never transition to employment. Indeed, pre-pandemic estimates from the ILO School-to-Work Transition Surveys (SWTS) show that, among 23 surveyed developing countries across the world, young people in MENA had the greatest share of individuals who would never transition to employment over their working lives. Young people in MENA also had the longest duration of transition from school to their first real employment, as compared to developing countries in all other regions. Young women were at a particular disadvantage. In Egypt in 2017, for example, within an estimated 15% of young people who would never transit employment, a stark difference is evident across genders: the share was 4% for men against 29% for women. Similarly, in Tunisia in 2017, 23% of young people who would never transit to employment; including 12% of men and 35% of women (Dachille et al., 2017^[24]). Gender inequality is also seen in the median time spent to find first employment (i.e. the time by which 50% of individuals are expected to find first employment). In Egypt, this was estimated to be 14 months for men and 82.8 months for women; in Tunisia, it was 21.2 months for men and 41.6 months for women (Dimova, Elder and Stephan, 2016^[21]; Dachille et al., 2017^[24]; OECD, 2017^[25]). COVID-19 has further complicated these matters.¹

As a result, the MENA region exhibits a high share of “discouraged” young workers, defined as those who are not working but who express a desire to work while not actually seeking work. This implies they feel that undertaking a job search would be a futile effort. Egypt and Tunisia (available data) show mid-range numbers of discouraged young workers in relation to MENA values (Figure 2.11).

Figure 2.11. Share of discouraged youth job seekers among total discouraged job seekers



Note: Years of data collection: Yemen = 2014; Mauritania = 2017; Iraq = 2012; Qatar = 2013; Egypt = 2020; Algeria = 2017; Tunisia = 2014; Jordan = 2020; Lebanon = 2019; Palestinian Authority = 2021; United Arab Emirates = 2020.

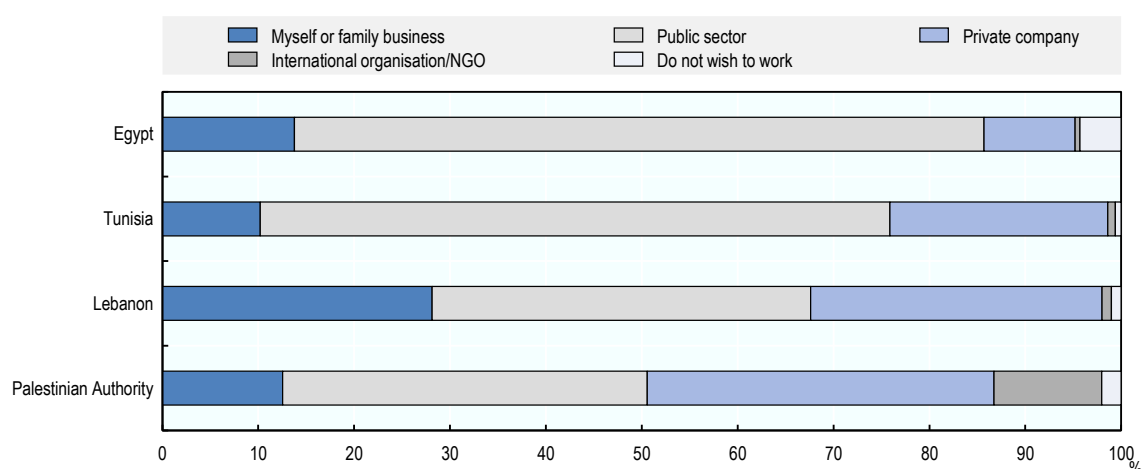
Source: ILO (2022), ILOSTAT, <https://ilostat.ilo.org/data/>.

Mismatch of expectations and reality also affects uncertain transition

The gap between young peoples' aspirations and the reality of labour markets is a major reason for young peoples' discouragement in MENA (in addition to the lack of jobs and long transitions) (Dimova, Elder and Stephan, 2016^[21]; Lorenceau, Rim and Savitki, 2021^[26]). Career aspirations of young Egyptians, Moroccans and Tunisians have little in common with current and projected labour demand in the region, making it even more unlikely that they will experience a smooth school-to-work transition. Most (over 65%) young people in Egypt and Tunisia (as well as in some other MENA counties) aspire to work in the public sector (Figure 2.12), including international organisations and non-governmental organisations (NGOs). Public employment remains highly valued, most likely because it combines characteristics of prestige, job stability and security. Clearly, however, the public sector cannot absorb all of these aspiring individuals.

Depending on the country in the MENA region, most surveyed students – i.e. between 70 and 90% – aspire for high-skilled occupations. Using definitions from the International Standard Classification of Occupations (ISCO), when asked which type of job they would like to do, the vast majority of students declared wanting to be in a high-skilled occupation such as manager (ISCO 1), professional (ISCO 2), or technician or associated professional (ISCO 3). The expectation to work in these jobs is unrealistic in that all these professions require at least some level of tertiary education, according to the ISCO categories. Yet, as shown above, enrolment rates in tertiary education do not match up with these aspirations. Also, many graduates with tertiary education complain that they did not receive adequate orientation, and that their diplomas do not correspond to the needs of the labour markets (OECD, 2021^[4]).

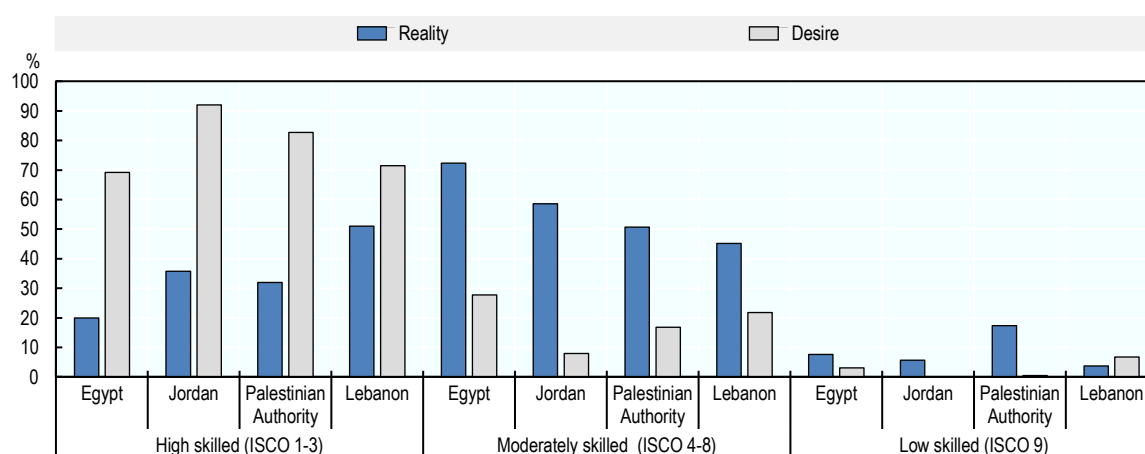
Figure 2.12. Desired sectors to work in, expressed by young people in selected MENA countries



Source: Authors' calculations based on School-to-Work Transition Surveys 2012-15 and data from ILOSTAT (2016).

Remarkably, student occupational preferences were highly similar across MENA countries: few expressed the wish to work in intermediate-skilled occupations (e.g. clerical support, services, sales or craft) and even fewer in low-skilled sectors (Figure 2.13). This may reflect the lower status and poorer working conditions in these sectors. In reality, the vast majority of young people do work in jobs requiring medium level of skill. Egypt is a case in point: in 2014, a gap of almost 50 percentage points existed between the share of students wanting to work in high-skilled occupations and the actual share of highly skilled young workers in the labour market. This potentially indicates that many young people are dissatisfied with the jobs they have.

Figure 2.13. Difference between the distribution of aspirations and the distribution of workers at different skills levels of the occupations by country



Source: Authors' calculations based on School-to-Work Transition Surveys 2012-15 and data from ILOSTAT (2016).

In Tunisia, unemployment among youth with tertiary education is also a well-known problem. The economic model of the country relies primarily on low- and medium-level types of skills. As such, many young workers are significantly over-qualified for existing jobs yet may lack specific technical skills for mid-level types of occupations, such as in industry or construction, that remain vacant (OECD, 2021_[12]).

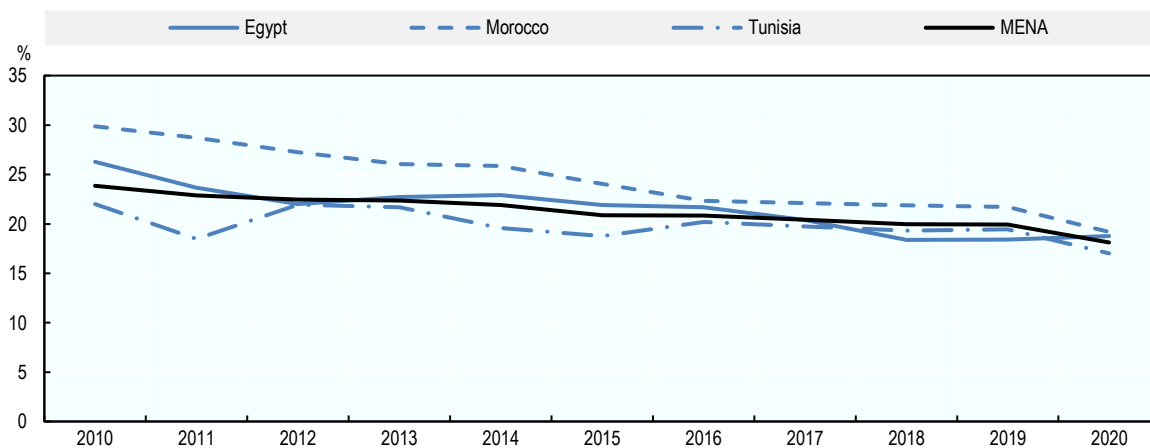
Given this stark gap between aspirations and reality, it is imperative to better orient students, equip them with the right skills for existing jobs, and create more and better opportunities for technical vocational education. In turn, it is vital to also create more and better entry-job opportunities across the full spectrum of medium to high level skills. Improving working conditions in jobs requiring a middle level of skill, with the aim of making them more attractive, is equally important. Failure to act on these challenges risks contributing to the loss of youth productive potential and reducing young peoples' trust in governments (OECD, 2020^[9]). It can also increase political instability and perpetuate out-migration. Indeed, among individuals aged 18-29, the desire to emigrate increased from 38% to 46% over the last decade in Morocco (Jamal, Robbins and Al-Shami, 2020^[27]; OECD, 2021^[4]) and reached 52% in Tunisia by 2018 (Jamal, Robbins and Al-Shami, 2020^[27]; OECD, 2021^[4]). Continuation of this trend also means that economies risk an investment loss in the education of their young people and are unable to fully reap the demographic dividends of their current youth population.

Young people in the labour market also face vulnerability and decent work challenges

Young people's participation in the labour market in Egypt, Morocco and Tunisia has been declining since the 2010s

Increased rates of school enrolment in secondary and tertiary education, along with persistently high levels of NEET (especially among young women), have contributed to a declining share of young peoples' participating in the labour market. On average throughout the region, about 18% of the youth population participated in the labour market in 2020, a substantial decrease from 26% in 2010. Egypt, Morocco and Tunisia were no exception to this trend, with the decline continuing throughout 2020 (Figure 2.14).

Figure 2.14. Youth (15-24) employment-to-population ratio



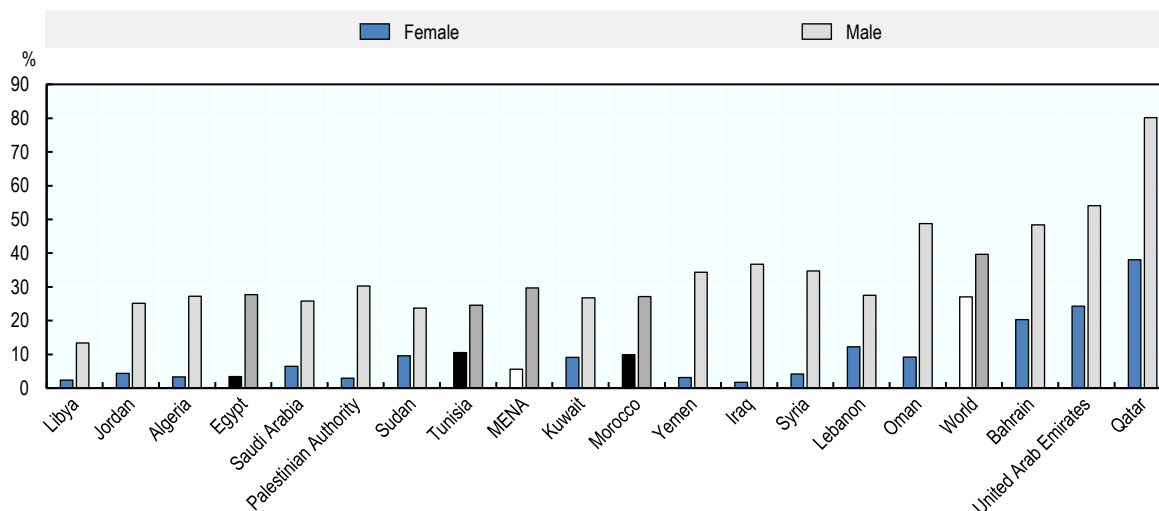
Note: The employment-to-population ratio is the number of persons employed as a percentage of the total population of a respective working age group. MENA definition for this figure includes the following countries: Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates and Yemen.

Source: ILO (2022), ILOSTAT, <https://ilostat.ilo.org/data/>.

Labour market participation rates of young women in MENA region are by far the lowest in the world, reaching barely 5% in Egypt and around 10% in Morocco and Tunisia, compared with 27% worldwide (Figure 2.15). Morocco and Tunisia show a 15-percentage point difference in male and female participation

rates; in Egypt, it rises to 30 percentage points. Labour force participation rates among young women in rural areas tends to be the same or slightly lower than in urban areas (ILO, 2016^[28]).

Figure 2.15. Youth employment-to-population ratio by sex in 2021



Source: ILO (2022), ILOSTAT, <https://ilostat.ilo.org/resources/concepts-and-definitions/ilo-modelled-estimates/>.

Youth unemployment rates in MENA are currently the highest in the world

Youth unemployment – defined as youth actively looking for work but not finding it – is another important challenge. Only four MENA countries (Bahrain, Oman, Qatar and United Arab Emirates) had youth unemployment rates lower than the world average of 15.6% in 2021 (Table 2.6). The situation is considerably worse among young women, for whom unemployment reached over 45% in 2021.

Table 2.6. Youth unemployment rate, percentage

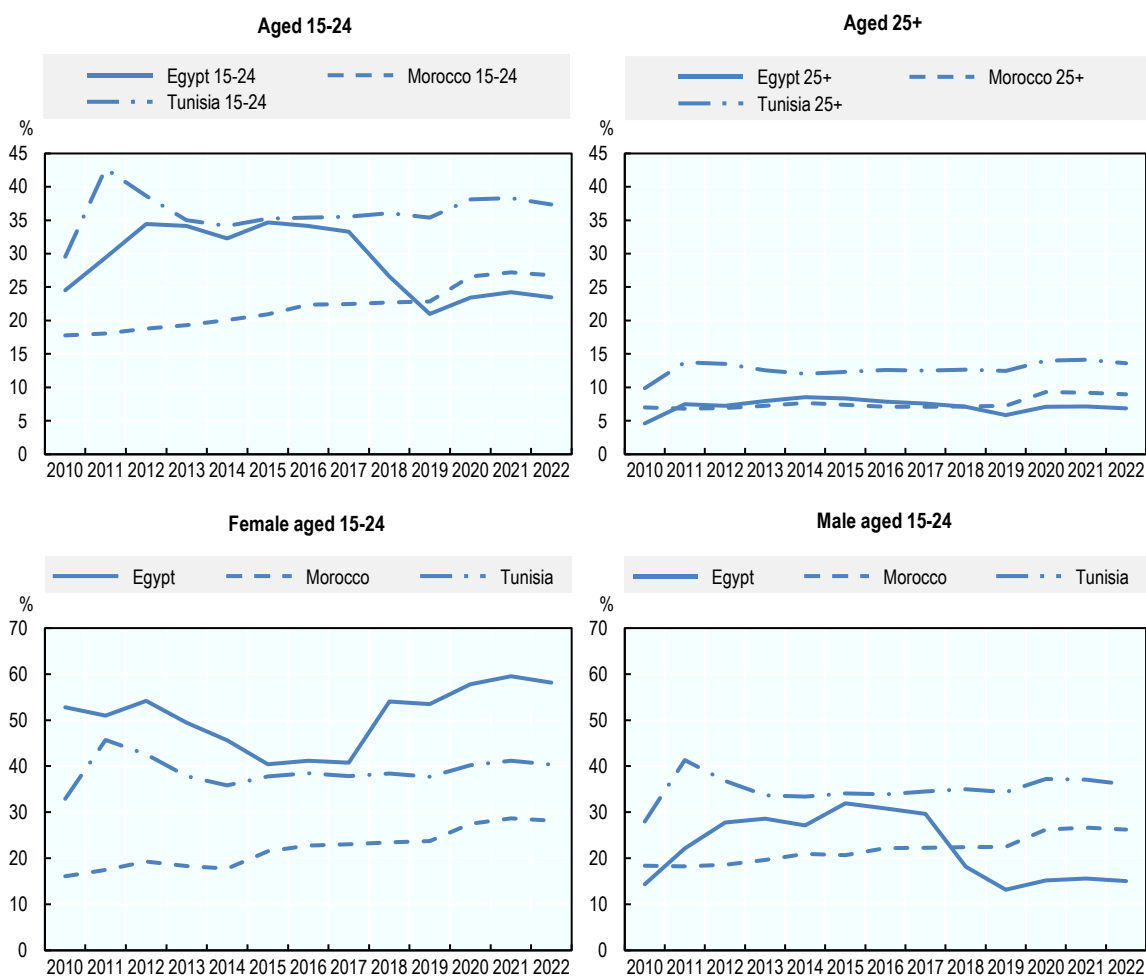
Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Libya	48.6	49.4	49.4	50.3	50.4	50.6	50.6	50.3	50.4	50.7	51.5	50.5
Jordan	28.6	29.7	28.2	29.4	27.9	30.9	35.6	35.4	38.7	36.8	40.7	40.5
Palestinian Authority	36.2	31.2	34.5	36.9	36.1	36.9	38.2	41.6	42	40	42	39.6
Tunisia	29.5	42.7	38.7	35	34.1	35.2	35.4	35.5	36	35.4	38.1	38.3
Sudan	28.3	32.7	32.6	32.5	32.5	32.5	32.5	32.5	32.6	32.8	35.8	35.6
Algeria	21.8	22.4	27.5	25.2	25.6	30.2	26.1	26.6	27	27.4	31	31.9
Lebanon	16.2	17.1	17.9	18.7	19.6	20.5	21.3	22.2	23.2	24.2	27.4	29.6
Morocco	17.8	18.1	18.8	19.3	20.1	20.9	22.4	22.5	22.7	22.9	26.6	27.2
Saudi Arabia	29.1	29.1	28.4	29.6	30.9	29.8	25.1	28	28.8	23	28.2	28.8
Iraq	16.6	16.3	16.1	18	19.9	21.2	22.5	25.3	25.3	25.3	27.2	27.2
Syria	20.1	20.5	20.9	21.2	21.2	21.4	21.7	21.9	22.1	22.3	25.2	26.2
Yemen	21.8	22.7	23	23.6	24.4	24.9	24.7	24.7	24.7	24.8	25.4	25.5
Egypt	24.5	29.4	34.4	34.1	32.3	34.7	34.2	33.3	26.6	21	23.4	24.3
Kuwait	9.1	10.6	12.2	13.8	15.3	16.1	15	15.2	15.2	15.3	19.4	25.5
Oman	14.6	14.3	14	14.3	14.8	15	14.2	11	7.8	8.3	15.4	14.6
United Arab Emirates	7	6.7	6.4	6.2	5.9	5.7	5.3	7.9	7.5	7.2	9	10.7
Bahrain	5	5.2	5.3	5.4	5.5	5.6	5.7	5.8	6	6.3	8	9.9
Qatar	1.3	1.3	1.5	1.1	0.7	0.6	0.5	0.5	0.4	0.4	0.6	1.1
MENA	23.4	24.9	26.4	26	26.1	27.4	27.5	27.6	26.2	24.7	27.5	27.7
World	13.1	13.1	13.2	13.4	13.2	13.5	13.8	13.7	13.5	13.5	15.2	15.6

Note: The ILO modelled estimates. Blue = higher values of indicator; grey = lower values. The intensity of shading reflects the distance from the midpoint, with darker shades indicating values farther away from the 50th percentile.

Source : ILO (2022), *ILOSTAT*, <https://ilostat ilo.org/data/>.

Youth unemployment in MENA is also higher than unemployment of the prime-age population (25 years and older), with young people being three times more likely to be unemployed (Figure 2.16). If Egypt showed a certain decline in youth unemployment leading up to 2020, the COVID-19 crisis reversed this trend, pushing youth unemployment to 24.3% in 2021. Already increasing trends were exacerbated by the crisis, bringing youth unemployment to 27.2% in Morocco and 38.3% in Tunisia in 2021. Young women are at a particular disadvantage in Egypt, where the difference between youth male and female unemployment is around 45 percentage points. Such differences are markedly lower in Morocco (3 percentage points) and Tunisia (5 percentage points).

Figure 2.16. Trends in youth unemployment rate, female and male, 2010-21



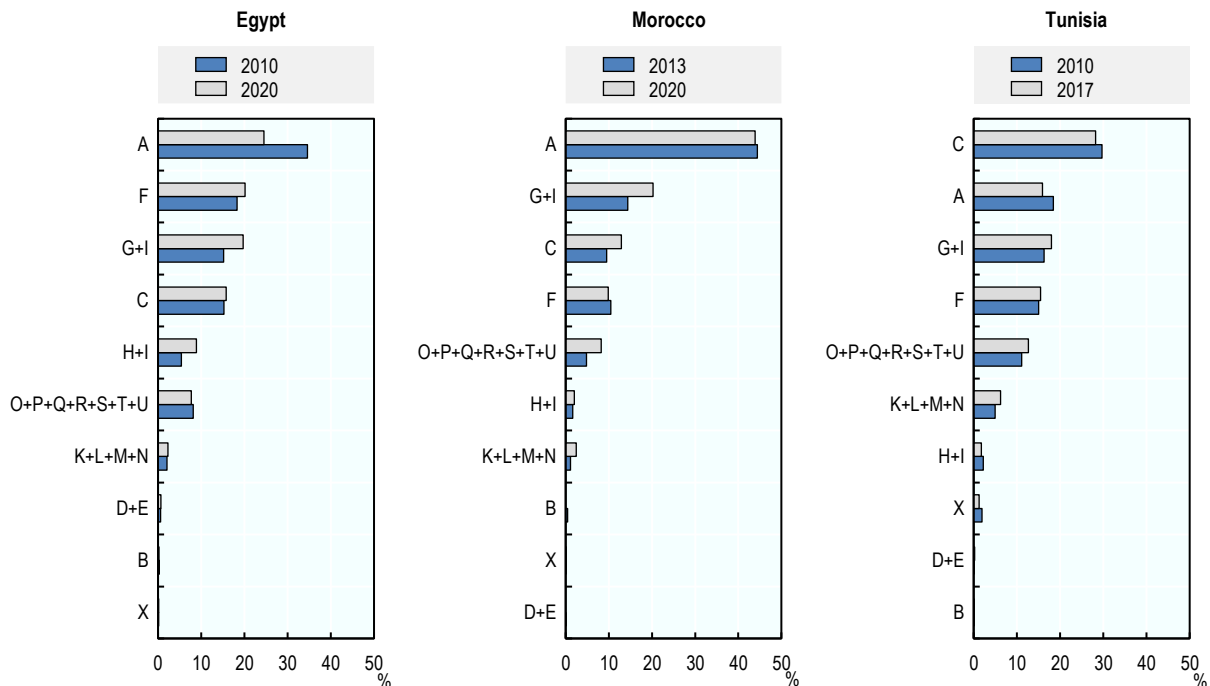
Note: 25+ is total population with age 25 years and over.

Source: ILO (2022), ILOSTAT, <https://ilostat ilo.org/resources/concepts-and-definitions/ilo-modelled-estimates/>.

Working young people are found predominantly in agriculture, though differences exist across countries

When young people work, their distribution varies across different sectors of activities, reflecting both the economic weight of these sectors in their home countries and the employment opportunities they represent. In Egypt and Morocco, agriculture still represents an important part of the economy. As such, it can more easily absorb young people in rural areas, in seasonal and in part-time work, while decent job opportunities are lacking in urban areas and other sectors (IFAD, 2019_[29]). Reflecting these factors, the largest share of Egyptian and Moroccan youth is concentrated in the agriculture, forestry and fishing sector. In Tunisia, however, more young people are found in manufacturing than in other sectors, with agriculture still holding the second position (Figure 2.17). In all three countries, the share of young people in agriculture declined over the past decade, though at varying rates. The years 2020-21 were particularly hard for workers in agriculture in all countries, who were affected by the combined shocks of drought and the COVID-19 pandemic, which disrupted access to inputs and presented financial difficulties to farmers (Cheung et al., 2022_[30]; Krafft et al., 2022_[31]).

Figure 2.17. Youth employment by economic activity (ISIC- 1 digit)



Note: The computation of sectors, based on International Standard Industrial Classification (ISIC) of all economic activities, was done as follows: A = agriculture; forestry and fishing. B = mining and quarrying. C = manufacturing. D+E = electricity; gas, steam and air conditioning supply, and water supply; sewerage, waste management and remediation activities. F = construction. G+I = wholesale and retail trade; repair of motor vehicles and motorcycles; accommodation and food service activities. H+J = transportation and storage. K+L+M+N = financial and insurance activities; real estate activities; professional, scientific and technical activities; administrative and support service activities. O+P+Q+R+S+T+U = public administration and defence; compulsory social security, education, human health and social work activities; arts, entertainment and recreation; other service activities; activities of households as employers; undifferentiated goods- and services-producing activities of households for own use; activities of extraterritorial organisations and bodies; information and communication. X = not elsewhere classified.

Source: Haut Commissariat au Plan (2022), www.hcp.ma/downloads/?tag=Derni%C3%A8res-parutions; ILO (2022), [ILOSTAT, https://ilostat.ilo.org/](https://ilostat.ilo.org/).

When young people work, they are at a higher risk of employment in precarious and informal jobs, as well as under-employment

The agriculture sector is historically plagued by informality, self-employment and non-standard work, including temporary (among others, seasonal) and part-time work (ILO, 2016^[28]; OECD/ILO, 2019^[32]). This is one reason (though not the only one) why young workers, who are disproportionately found in this sector, are at a particularly high risk of working in informal economy and in non-standard jobs. In other sectors, other reasons also include the lack of formal standard work opportunities, a very high share of enterprises with limited hiring capacity. In Tunisia, for example, 88% of enterprises do not have employees and 97% are microenterprises with five or fewer employees (Cheung et al., 2022^[30]; Krafft et al., 2022^[31]). The fact is that many young people lack experience and networks to acquire formal standard jobs or that they may combine work with education. Combined, all these factors lead to higher rates of non-standard and informal work among young people as compared to the prime-age population.

Informality among young people reaches over 90% in Egypt and over 80% in Tunisia (Table 2.7). In Morocco, the share of young workers without a contract (a proxy measure of informality) reached 83% in 2017 (Ministère du Travail et de l'Insertion Professionnelle, 2020^[33]). Informal work is often characterised by poor job quality, absence or inadequacy of social protection, and generally weak career development and advancement opportunities (OECD/ILO, 2019^[32]; OECD, 2023^[34]). During the crisis induced by the

COVID-19 pandemic, informal wage workers outside establishments and self-employed individuals experienced the largest declines in their incomes in all three countries (Cheung et al., 2022^[30]; Assaad et al., 2022^[35]; Krafft et al., 2022^[31]).

Table 2.7. Youth (15-24) informal employment rate by sex and age, percentage

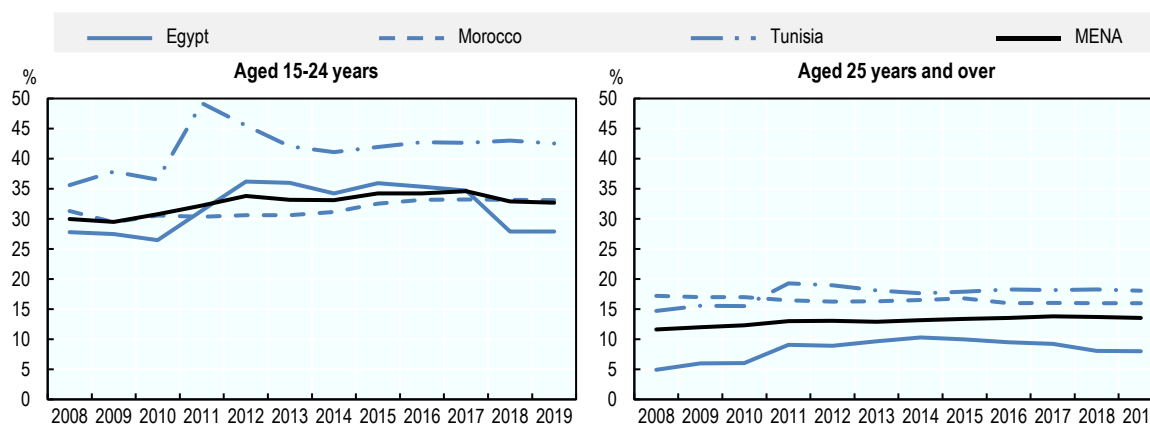
Country	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Sudan		94.6										
Egypt	85.9	87.4	86.7	87.1		88.8	85	87.8	90.1	91.1	90.2	
Yemen					89.2							
Palestinian Authority	81.4	83.1	84.6	86.2	87	87.5	86.6	86	84	82.6	78.8	79.1
Tunisia					82.1							
Lebanon										72.8		
Jordan								53.6	54.3	58.5	54.8	

Note: Blue = higher values of indicator; grey = lower values. The intensity of shading reflects the distance from the midpoint, with darker shades indicating values farther away from the 50th percentile.

Source: ILO (2022), ILOSTAT, <https://ilostat.ilo.org/>.

Part-time work remains a predominantly female phenomenon, most often found in rural areas. For example, in Morocco throughout the 2010s, the rate fluctuated around 30% for women in contrast to 8% for men, and around 16% in rural areas against 9% in urban ones (Ministère du Travail et de l'Insertion Professionnelle, 2020^[33]).

Figure 2.18. Underemployment rate by age



Note: Imputed observations are not based on national data; as such, they are subject to high uncertainty and should not be used for country comparisons or rankings. Persons in time-related underemployment comprise all persons in employment who satisfy the following three criteria during the reference period: a) are willing to work additional hours; b) are available to work additional hours (i.e. are ready, within a specified subsequent period, to work additional hours, given opportunities for additional work); and c) worked less than a threshold relating to working time (i.e. persons whose hours actually worked in all jobs during the reference period were below a threshold, to be chosen according to national circumstances). The series is part of the ILO modelled estimates and is harmonised to account for differences in national data and scope of coverage, collection and tabulation methodologies as well as for other country-specific factors.

Source: ILO (2022), ILOSTAT, <https://ilostat.ilo.org/>.

Some part-time work may also be related to underemployment. Employed persons are deemed to be in time-related underemployment if they consider their work hours insufficient and are willing and available to engage in extra hours of work in the reference period. Throughout MENA, young people struggle more

than adults to find sufficient working hours. In 2019, the underemployment rate among young people was over 32% of employed young people, in contrast to 13.6 % for prime-age workers, with the highest shares (42.5%) in Tunisia (Figure 2.18). In Morocco, the share of underemployment is twice as high (11.1%) for men as compared to women (5.4%) in 2017 (Ministère du Travail et de l'Insertion Professionnelle, 2020^[33]).

Key policy messages

The findings of this chapter show that the MENA region, and especially Egypt, Morocco and Tunisia, will continue experiencing a significant increase in the workforce before the middle of the century. This will be driven by the rise of the young workforce, whose weight will remain considerable in rural areas despite ongoing urbanisation.

While Egypt, Morocco and Tunisia made significant progress in the quantity of schooling, more is needed to boost the quality of schooling and to better equip future workers with the relevant skills for the labour markets.

In parallel, labour markets should also prepare to absorb this large influx of the labour force, by creating more and better jobs, preferably formal. Currently, the workforce potential of young people in MENA is not used fully. Young people, especially young women, face important difficulties transiting from work to school. When young people do work, the greatest share is found in low- and moderately-skilled jobs, despite a growing share of young people with tertiary education. Agriculture remains a key entry point for young people, often reflecting lack of choice. A large share of young people works informally.

Given the challenging situation, it is not surprising that young workers throughout the region aspire to having more quantity and quality of work, and thereby to better use their time, their skill, and their overall potential. It is imperative that governments take action to provide them with the opportunities for doing so.

Notes

¹ These numbers are obtained from a regression (duration) analysis. As such, they may differ from the crude rates reported in other sources.

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3 Opportunities and challenges in the agro-food sector

Agro-food is a strategically important sector for the MENA region

Agro-food sector plays a vital social and economic role, but is affected by a range of external factors

As in many MENA countries, agro-food is a strategic sector in Egypt, Morocco and Tunisia that plays two major roles: it ensures food security, and it provides essential employment and economic opportunities. The sector's state is affected by climate change, but also contributes to it. Ongoing evolution of the sector presents a number of economic, social and environmental opportunities and challenges.

In all three countries, demand for products from the agro-food sector is expected to continue growing in the coming decades, albeit at a slower rate as compared to the period 1990-2020 (OECD/FAO, 2018^[1]). This growth will be driven by the continuing population growth, as well as rising per-capita incomes, although it may be negatively affected by price increases. Rising incomes are likely to stimulate dietary changes, pushing up demand for meat, fish and dairy products, although this transition is expected to be slow. Urbanisation, in turn, will increase demand for processed and prepared convenience foods, as well as for foods served through restaurants and catering. Urbanisation is also changing food purchasing habits, through a growing role of supermarkets (OECD/FAO, 2018^[1]).

As a result, the opportunities of the agro-food sector include improving the agriculture yields to increase domestic agriculture production and make it more profitable; developing new agriculture and food products; and creating possibilities for greater domestic value addition throughout the sector. Grasping these opportunities can help meet the evolving local demand for agricultural products while also providing socio-economic benefits in terms of better employment (including of young women and men) and higher wages while also boosting profits (OECD, 2021^[2]). The benefit of multiple growing seasons, as well as the proximity to markets in both other Arab States and Europe, can support expanding exports of agriculture products.

These opportunities, however, come with multiple challenges, particularly related to overcoming heightened dependence on international trade for basic food commodities; reconciling domestic food production with more efficient and sustainable use of water and land resources; and boosting resilience to climate change.

Indeed, over 1990-2022 period, growing food demand in many MENA countries has already led to increased import dependence for key staple food products. Concerned with this dependence, several countries made the choice to channel some of their domestic agricultural production towards basic commodities. Around 2016, in Egypt and Morocco, over 50% of harvested land was devoted to cereals (OECD/FAO, 2018^[1]). The COVID-19 crisis, and subsequently the full-scale aggression of Russia against Ukraine, underscored the expedience of this approach, as both events disrupted imports of basic foods,

as well as seeds, fertilisers and machinery needed for local agriculture production. As is well known, this led to soaring food prices on the international markets (OECD, 2022^[3]).

Yet, increased reliance on local production of some commodities (such as wheat) seems to be in contradiction with sustainability of the sector in the long run. This is because MENA is one of the most limited regions in the world in terms of agricultural land and water sources, while wheat production is water-intensive. In fact, per drop of this scarce resource, cereals provide lower returns than other products, such as fruits or vegetables.

As such, MENA countries need to strike the right balance between reducing dependency on international markets and producing food in line with available natural resources – which will likely be altered by climate change – ideally achieving greater yields that could improve economic outcomes and food security. Policies put in place by the governments will play a key role in turning these challenges into opportunities.

Agro-food sector is increasingly organised through complex value chains

The agro-food sector is organised within and across domestic and global value chains (DVC and GVC) (Figure 3.1) (OECD, 2023^[4]). These supply chains refer to the system encompassing all the activities, organisations, actors, technology, information, resources and services involved in producing agro-food products for consumer markets (OECD/FAO, 2016^[5]). As such, agro-food supply chains consist of a wide range of enterprises, ranging from small-holders, farmer organisations, co-operatives and start-up companies to SMEs through parent companies or their local affiliates, state-owned enterprises and funds, private financial actors and private foundations. The structure of supply chains – and of enterprises involved at each stage – varies significantly across products and geographies (OECD/FAO, 2016^[5]).

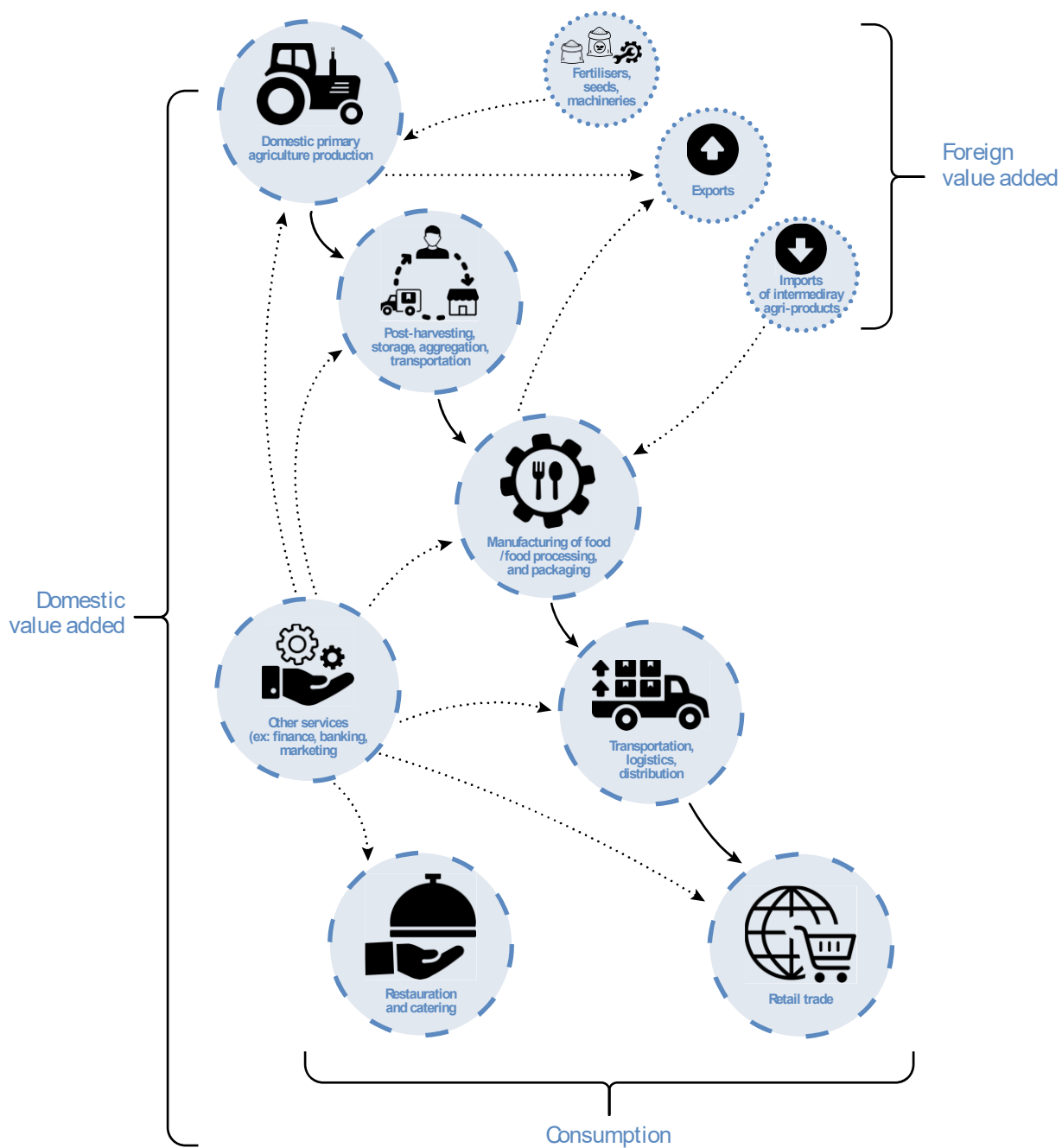
Domestic primary agriculture production is the key node of any agro-food value chain. This node has several backward linkages that connect agriculture production to (among others) chemical industries producing fertilisers and pesticides; to machinery production (e.g. tractors, other agriculture equipment and spare parts); and to education, research and development (producing agriculture scientists). In the MENA region, many of these backward linkages are currently ensured through connections to the international markets – or, put simply, to imports.

Within the agro-food sector, domestic primary agriculture production also has forward linkages, through which produce is stored, aggregated and transported; processed, used as inputs in manufacturing of food and beverages, and packed; and distributed to accommodate the wholesale or retail trade, or to be used in restauration and catering. Supply chains also include support services such as extension services, financial, banking, marketing services and information, as well as research and development.

Throughout the world, value added to agricultural production through the forward linkages is more important than that added through backward linkages. This provides an economic rationale for developing such forward linkages domestically (OECD, 2020^[6]). Moreover, in contrast to other sectors, domestic forward value chains stemming from agricultural production tend to dominate global forward value chains, because most of the food production is consumed locally. Even when agriculture food products cross borders, often it is for use as intermediates in the final goods of the domestic market of the first importing country (Greenville, Kawasaki and Beaujeu, 2017^[7]). In developing countries, some segments – such as processing, logistics and wholesale – can make up 30-40% of the value added in agro-food value chains (Reardon, 2015^[8]). However, as will be shown in this chapter, growing domestic demand for various types of agro-food products – as well as domestic generation of the value-added along the full agro-food chain in the MENA region – remains largely underexploited (OECD, 2018^[9]). In other words, the domestic value addition, and the benefits that it can bring in terms of employment, wages and profits, are yet to be seized.

In what follows, this chapter focuses on the forward participation of the agriculture production sector, outlining opportunities and challenges specific to each node of agro-food value chains in Egypt, Morocco and Tunisia.

Figure 3.1. A schematic representation of the agro-food value chain



Source: Authors' compilation.

Being diverse, agriculture production faces some of the greatest geo-economic challenges as compared to other segments of the agro-food value chain

Domestic agriculture production – the first key node of any agro-food value chain – remains an important source of employment in many MENA countries. Around 2020, its contribution to total employment varied from 0.9% in Bahrain to 39.7% in Sudan. Egypt, Morocco and Tunisia showed a decline in agriculture production employment over the last decade. Nevertheless, employment in this sector remained sizeable in 2020, representing 23.3% of employment in Egypt, 34.1% in Morocco and 12.7% in Tunisia (Table 3.1). In many MENA countries, agriculture production also contributes a non-negligible share to the total economy's value added (Table 3.1).

Table 3.1. Employment and gross value added shares of agriculture, hunting and fishing sector in MENA, in percent

Country	Employment by economic activity branches (share [%] of total employment)			Value added by agriculture, forestry and fishing (share [%] of GDP)		
	2010	2019	2020	2010	2019	2020
Sudan	45.7	38.4	39.7	31.9	20.2	20.4
Syria	14.5	10.1		19.4	39.8	
Mauritania	35.9	30.8	50.6	16.7	21.7	20.2
Morocco	40.6	33.3	34.1	12.9	12.1	11.7
Egypt	28.3	20.6	23.3	13.3	11.0	11.6
Algeria	11.9	9.6	9.7	8.5	12.3	14.1
Tunisia	17.9	13.8	12.7	6.8	9.6	10.1
Yemen	24.1	27.6	28.6	8.2	5.0	5.0
Iraq	23.1	18.3	17.8	5.2	3.7	5.9
Jordan	3.4	2.5	3.0	3.6	4.9	5.2
Lebanon	14.4	11.3	13.4	3.9	3.1	3.0
Saudi Arabia	4.2	2.4	2.3	2.6	2.2	2.6
Oman	5.2	4.0	4.5	1.2	2.0	2.6
Kuwait	2.4	1.8	2.0	0.5	0.4	0.5
Bahrain	1.1	0.9		0.3	0.3	0.3
Qatar	1.5	1.2	1.2	0.1	0.3	0.3

Note: Blue = higher values of indicator; grey = lower values. The intensity of shading reflects the distance from the midpoint, with darker shades indicating values farther away from the 50th percentile.

Source: World Bank (2023), *World Development Indicators*, <https://data.worldbank.org/>; FAO (2023), *FAOSTAT*, <https://www.fao.org/faostat/en/#data/OEA>.

Throughout the region, domestic agriculture production faces numerous challenges. Some are related to geographical and climate constraints; others are man-made and reflect difficult policy choices regarding the types of agricultural products to produce locally or to import.

Land and water resources are scarce in MENA countries

Most MENA countries suffer from severe land constraints. Generally, the share of land used for agriculture is low and dictated by topographic characteristics and prevailing climatic conditions (OECD/FAO, 2018^[1]). Less than 5% of land is arable in most MENA countries, including Egypt (Table 3.2). While Morocco and Tunisia have better agricultural land endowments, most land is in grazing pastures, again leaving arable land limited. Throughout the region, arable land suffers from ongoing degradation caused by wind and water erosion and by unsustainable farming practices, both of which significantly reduce productivity. Land constraint means that MENA countries are limited in their options to cultivate a variety of agriculture products. Moreover, for optimal land use, they need a skilled workforce to forecast, analyse and operationalise the best land use.

Table 3.2. Land and water resources in MENA countries

Country	Agricultural land (% of land area), 2018	Arable land (% of land area), 2018	Annual freshwater withdrawals, total (billion cubic meters), 2017	Renewable internal freshwater resources, total (billion cubic meters), 2017
Syria	75.8	25.4	14.0	7.1
Tunisia	62.7	16.8	4.8	4.2
Morocco	67.4	16.8	10.6	29.0
Lebanon	64.3	12.9	1.8	4.8
Iraq	21.3	11.5	38.5	35.2
Algeria	17.4	3.2	9.8	11.3
Egypt	3.9	2.9	64.2	1.0
Jordan	11.5	2.3	0.9	0.7
Yemen	44.3	2.1	3.6	2.1
Bahrain	11.0	2.1	0.2	0.0
Saudi Arabia	80.8	1.6	21.2	2.4
Qatar	5.8	1.2	0.3	0.1
Libya	8.7	1.0	5.7	0.7
United Arab Emirates	5.4	0.6	2.6	1.0
Kuwait	8.4	0.5	0.8	0.0
Mauritania	38.5	0.4	1.4	0.4
Oman	4.7	0.3	1.6	1.4
MENA	33.2	4.6		

Note: Blue = higher values of indicator; grey = lower values. The intensity of shading reflects the distance from the midpoint, with darker shades indicating values farther away from the 50th percentile.

Source: World Bank (2022), *World Development Indicators*, <https://data.worldbank.org/>.

This region is also the most water-scarce in the world. Most MENA countries use groundwater at rates that exceed renewable, internal freshwater resources. Because of the dry climate, about 40% of cropped area requires irrigation (FAO, 2017^[10]; FAO, 2023^[11]). In Egypt, the agriculture sector consumes 86% of all water resource (UNIDO, 2020^[12]).

The problem of water scarcity is not limited to geographical endowments (OECD/FAO, 2018^[1]). It is also related to long-term, unsustainable ground and surface water exploitation, which is causing depletion of

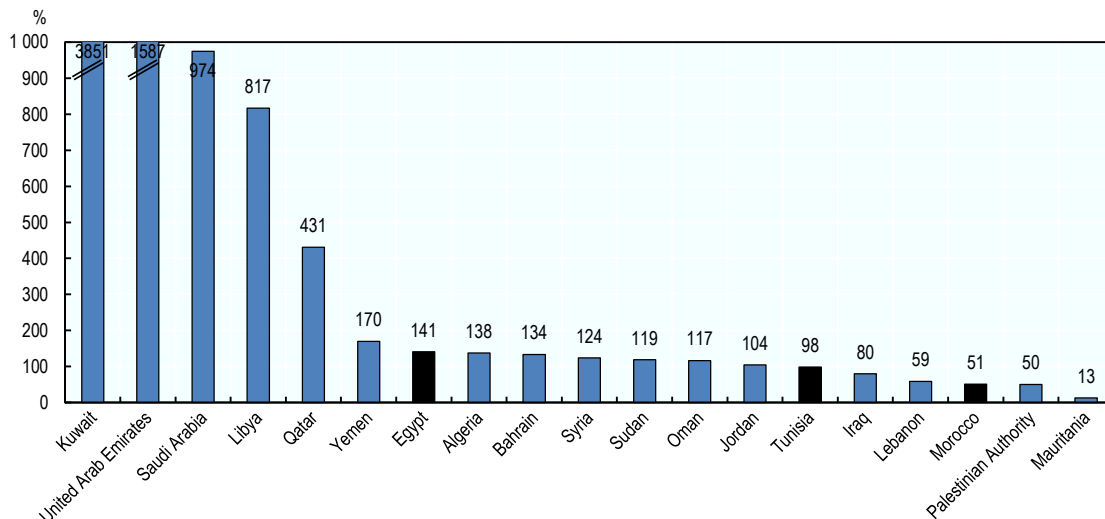
the region's highly dependent subterranean aquifers (World Bank, 2017^[13]). In 2014, over half of countries in the region withdrew more freshwater than could be had from renewable resources. The region also has the lowest water rates in the world and subsidises water use; its overall water productivity is half that of the global average (World Bank, 2017^[13]). As a result, in most MENA countries (including Egypt, Morocco and Tunisia), the per-capita annual renewable water resources are below the generally accepted water scarcity line.

Agriculture is the predominant user of water in Egypt, Morocco and Tunisia, which means that improving the management of water in agriculture is key to address water scarcity and sustainability, and to prevent soil degradation and adapt to climate change. Indeed, climate change is expected to render the region hotter and dryer in the future, presenting challenges to rain-fed farming systems (OECD/FAO, 2018^[11]). The choice of crops that use water more productively also becomes critical. The highest payoff per drop of water, for example, can be obtained by producing fruits and vegetables, rather than cereals.

Multiple factors contribute to the scarcity of freshwater in the MENA region, such as a rapid population growth, water pollution, excessive dependence on water resources that cross national borders, damage to water infrastructure, and inefficient use of water resources, particularly in agriculture. The effects of climate change, such as rising temperatures and a decline in precipitation, exacerbate this issue (UNESCWA et al., 2017^[14]). Efforts to decrease the number of people facing water stress are hindered by the reality that 13 countries in the region currently consume over 100% of their available freshwater resources (Figure 3.2). As a result of this scarcity, dependency on transboundary waterways, non-renewable groundwater resources and unconventional water sources has increased in many countries (ibid).

Figure 3.2. Level of water stress in MENA region in 2020

Freshwater withdrawal as a percentage of available freshwater resources



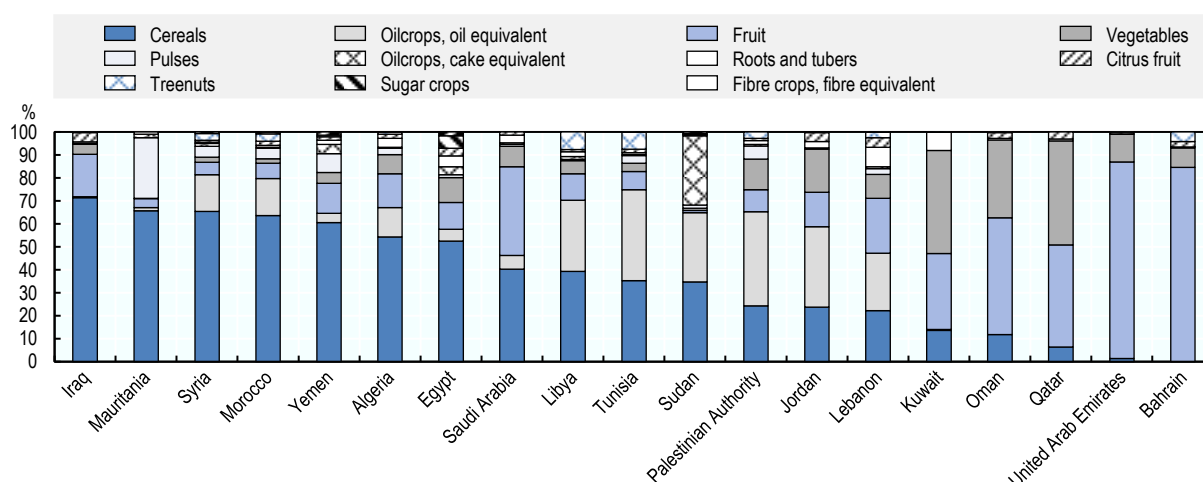
Note: The level of water stress is calculated as freshwater withdrawal as a percentage proportion of available freshwater resources. It is thus the ratio between total freshwater withdrawn by all major sectors and total renewable freshwater resources, after considering environmental water requirements. Main sectors, as defined by ISIC standards, include agriculture, forestry and fishing, manufacturing, electricity industry, and services. This indicator is also known as water withdrawal intensity.

Source: FAO (2022), AQUASTAT database, https://tableau.apps.fao.org/views/ReviewDashboard-v1/country_dashboard?%3Aembed=y&%3AisGuestRedirectFromVizportal=y.

The choice of crops has an important bearing on the optimal use of resources and economic outcomes

Significant variation exists across MENA countries in the types of agriculture products that they produce. Historically, cereals have dominated and still occupy about 70% of the harvested land area across the region, including over 50% of harvested land area in Egypt and Morocco (Figure 3.3). In many countries, policies have encouraged cereal production as a means to lower import dependence for these basic foods. In Egypt, the availability of rich soils and irrigation has also driven the choice to produce cereals, ultimately allowing it to have the greatest wheat yields in the region. Several other countries, including Tunisia, have devoted over 50% of their harvested area to horticultural crops.

Figure 3.3. MENA harvested area share, by country and crop type in 2021



Note: The data concern only the primary crops, i.e. those that come directly from the land without having undergone any real processing, apart from cleaning. The crops maintain all the biological qualities they had when still on the plants. Various main agricultural crops can be combined, considering their actual weight, to provide comprehensive data on land area. This includes crops such as cereals, root vegetables, tubers, nuts, vegetables, and fruits, allowing for meaningful analysis and interpretation. Other primary crops can be aggregated only in terms of one (or more) component that is common to all of them. For example, primary crops of the oil-bearing group can be aggregated in terms of oil or oil cake equivalent. The aggregation was done using the UN Central Product Classification (CPC) Version 2.1, [https://unstats.un.org/unsd/classifications/Econ/Download/In%20Text/CPCv2.1_complete\(PDF\)_English.pdf](https://unstats.un.org/unsd/classifications/Econ/Download/In%20Text/CPCv2.1_complete(PDF)_English.pdf).

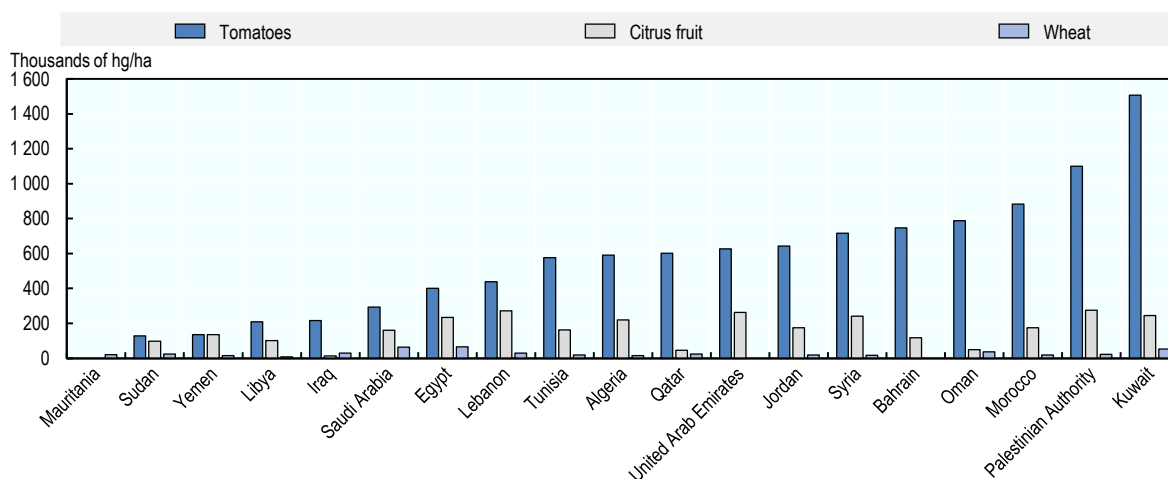
Source: FAO (2022), FAOSTAT, <https://www.fao.org/faostat/en/#data/QCL>.

Horticultural crops generally result in greater yields than cereals (Figure 3.4). Despite occupying a smaller share of land area, they provide the greatest value of agricultural production in many MENA countries, including Egypt, Morocco and Tunisia (Figure 3.5). Given their higher yields, greater economic value and better water productivity, horticultural crops represent a very attractive option of specialisation for the region in that they can contribute to both sustainable use of available resources and to improved economic outcomes for their producers, especially in rural areas.

Despite such benefits, it may be difficult for the three countries in question to switch to horticulture production for several reasons. One is that agriculture production is dominated by smallholders, who may have limited individual possibility to link to the rest of the value chain (e.g. processing, packaging and distribution) as well as limited market access and market knowledge (Weinberger, Lumpkin and General, 2005_[15]). In turn, cultivation of horticulture crops is frequently riskier than other, more staple crops because yields and prices are more unpredictable and these products are significantly more expensive to grow per hectare. But perhaps the most important reason is related to concerns about an already high dependence

on staple food imports, and the need to maintain a certain level of local production of cereals that is highly regulated, while being bound by arable land availability.

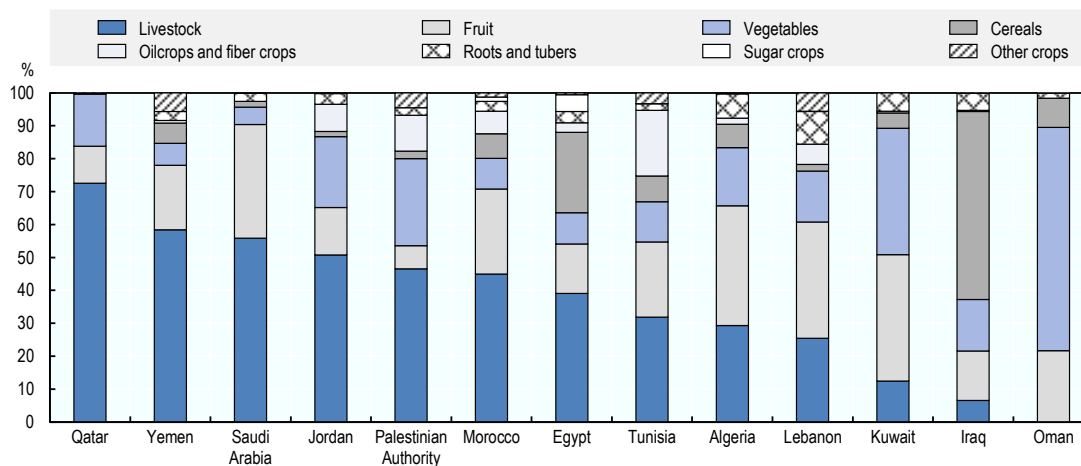
Figure 3.4. Average tomatoes, citrus fruit and wheat yields in selected MENA countries for 2016-21, in thousands of hg/ha



Note: Hg/ha represents the unit of measure for expressing yield per hectare, indicating the amount of a particular crop produced per hectare of land. Data are missing for tomatoes yields in Mauritania and for wheat yields in United Arab Emirates and Bahrain.

Source: FAO (2022), FAOSTAT, <https://www.fao.org/faostat/en/#data/QCL>.

Figure 3.5. Share of agricultural products in agriculture value added in 2020



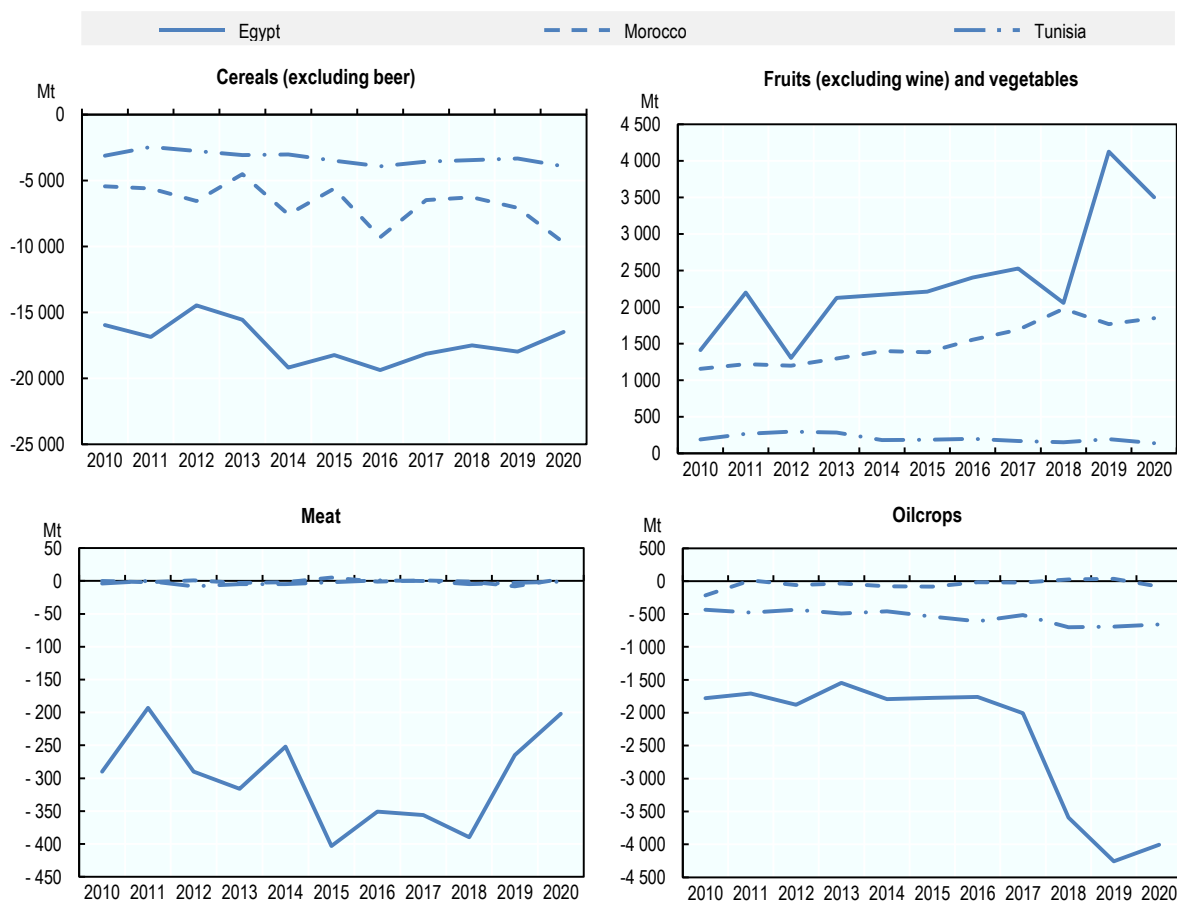
Source: FAO (2022), FAOSTAT, <https://www.fao.org/faostat/en/#data/QCL>.

Concerns over high dependence on staple food imports preclude greater development of horticulture

Over the 1990-2020 period, numerous MENA countries found themselves dependent on imports of food and basic agriculture commodities. Globally, in 2021, the share of food imports within merchandise trade was about 8%; it stood at 12% across the MENA region, including 12% in Tunisia, 13% in Morocco and 21% in Egypt. Over the decades, this dependence was greatest for basic staple foods, especially cereals

(OECD/FAO, 2018^[1]), driven by strong demand growth: as the population increased and income rose, demand began outstripping production growth of these foods (Figure 3.6).

Figure 3.6. Difference between domestic production and demand of selected commodities in 2010-20, in megatonnes



Note: For each primary commodity, food demand is calculated as the total quantity of the commodity produced in a country added to the total quantity imported and adjusted by exports. Calculations of the commodity demand do not distinguish between food supplies available for human consumption and those fed to livestock, used for seed, manufactured for food use and non-food uses, or lost during storage and transportation. Source: FAO (2022), FAOSTAT, <https://www.fao.org/faostat/en/#data/QCL>.

This dependence raised important concerns about countries' vulnerability to possible disruptions of food imports and especially to price fluctuations for these commodities on world markets. In turn, many MENA countries are choosing to continue producing cereals domestically to the extent possible, even if switching to crops such as horticulture could be more optimal from resource-use and yield perspectives.

The years 2020-23 further underscored the risks of this dependence. The COVID-19 induced crisis starting in 2020, followed by draughts in Canada in 2021, led to soaring prices on many food commodities. At the end of 2021, wheat prices were approximately 30% higher than at the end of 2019 (Arriola et al., 2023^[16]). Similar increases were observed for corn, sorghum and barley, and also for food oil (FAO, 2022^[17]). Russia's large-scale aggression on Ukraine had a further staggering effect on prices of food commodities. Disruption of imports put countries such as Egypt in direct danger of basic food supply shortage (Box 3.1) and indirect danger through soaring prices of cereals – and of fertilisers used for their domestic production – on world markets.

Box 3.1. Russia's large-scale aggression on Ukraine posed enormous challenges to food security in MENA, and especially in Egypt

Prior to the war, Russia and Ukraine provided a significant share of the global supply of wheat, maize and sunflower oil, as well as other agricultural commodities. Their combined produce stood at about 29% of global wheat exports, 19% of maize exports and 78% of sunflower oil exports. Over 2018-20, Ukraine alone produced 50% of global sunflower oil, 12% of wheat, 16% of corn and 18% of barely (Craig Hanson et al., 2022^[18]). In 2021, Ukraine marked a record-high harvest, boosting its wheat exports 22% over a year, and extending exports to a range of new countries, mainly in the MENA region (Nandy, 2022^[19]).

The outbreak of the Russian aggression in 2022 led to a drastic disruption of exports from Ukraine, as a result of direct destruction of storage and logistics facilities, as well as from the blockade of Ukrainian ports and the closing of sea routes by Russia. At the time of this report's writing, great uncertainty remained over Ukraine's future harvest. Over 30% of agriculture land was either occupied by Russia or was in the direct war zone throughout 2022 and early 2023 and many fields were mined. In turn, agriculture machinery is destroyed, fertilisers have not been supplied and fuel prices to crop were soaring (Ukrainian Parliament's Committee on Agrarian and Land Policy, 2022^[20]). Current estimates suggest that, at best, 50% of the pre-war year will be cropped in 2023, with uncertainties remaining over the yield and the possibility to export the eventual harvest. Uncertainties also exist over Russia's capacity to export.

As a result of the Russian aggression on Ukraine, food prices globally have risen to record highs in 2022. World wheat prices were already at all-time high before the war and continued rising after the start of the invasion. The loss of Ukraine's capacity to export – together with a 50% reduction in Russian wheat export – could lead to a 34% increase in international wheat prices in the marketing year 2022/23 (OECD, 2022^[21]). In the case of food oils, additional issues with global supply have added to the price pressure worldwide. Serious disruptions to Ukraine's export of sunflower oil pushed up demand for and prices of substitutes including palm oil, soy and rapeseed oil. Russia and Belarus are also major producers and exporters of fertilisers. Following sanctions on both countries, the World Bank's Fertilizer Price Index increased by nearly 10% in the first quarter of 2022. Between April 2020 and March 2022, fertiliser prices jumped by 220% (World Bank, 2022^[22]; World Bank, 2022^[23]).

Many MENA countries import a significant share of their caloric needs while low- and middle-income countries in Africa and the Middle East are the main import destinations for wheat from Ukraine (FAO, 2022^[24]). Egypt was particularly hard hit by the ripple effects: on the eve of the war in 2022, it had a 48.5% self-sufficiency in wheat and corn. Before the war, 36.7% of all wheat imports and 28% of corn imports to Egypt were from Ukraine (FAO, 2022^[25]). In response to the war, Egyptian government announced export restrictions on key staples and strengthened efforts to enhance its resilience by building strategic reserves of food or feed commodities (OECD, 2022^[3]).

The unprecedented price increase for agricultural crops and fertilisers has put enormous pressure on MENA countries. Food price increases had a devastating impact on poor families who typically spend over two-thirds of their resources on food. Often, the poorest families are particularly dependent on basic commodities, such as wheat and corn – precisely those most disrupted by the Russian aggression on Ukraine. Notably, 33 million Egyptians living below poverty level consume primarily these products. As they cannot substitute away to more expensive products, the current situation exacerbates the risk of malnutrition and undernourishment.

Source: Authors' compilation.

More innovative efforts will have to be devoted to improving the productivity of agriculture production

Given the above, it seems unlikely that MENA region countries will make a significant move away from their own production of cereals in the near future, even if this production is sub-optimal and costly. As such, it will be important to direct more effort to boost productivity of all types of agriculture production, including by improving cultivation practices, using better, modern farm machinery, improving extraction efforts and harvesting methods, and using different more modern production technologies. Also, it will be important to improve transportation, storage and packaging to prevent losses of agricultural production further down the agro-food chain.

Some initiatives to improve productivity of agricultural production, both public and private, are already underway across Egypt, Morocco and Tunisia. In Morocco, the Green Generation 2020-30 Plan (launched by the government in 2020) intends to boost digitalisation and introduce new technologies to agriculture production (OBG, 2023^[26]). New agriculture techniques and methods are also being introduced across the country. Precision irrigation is one technology that several start-ups are implementing. Combining the use of satellite imagery and sensors to regulate water consumption, this method may cut water use in a given area by 25% (OBG, 2023^[26]). Tunisian start-ups are exploring similar practices; placing sensors in irrigation pipes and the soil itself can help farmers control soil salinity while conserving water (OBG, 2023^[26]). Scaling up of such efforts relies critically on the availability of the right mix of skilled and semi-skilled workforce.

By investing funds and establishing appropriate policies that promote a research and development agenda, domestic wheat output in MENA may be boosted. Recent practises show that including wheat as a second crop can intensify cropping systems while enhancing year-round water management and water consumption. Thanks to heat-tolerant cultivars, wheat can also be grown in lowland regions with irrigation. It is important, however, to maintain natural areas and use agriculturally diversified production methods to ensure that wheat self-sufficiency in MENA is accomplished in a sustainable manner (Silva et al., 2023^[27]).

Productivity can also be enhanced through the economies of scale, for example by aggregating supply of small producers, introducing new technologies and modern mechanisation and sharing of farm equipment. This possibility relies (among others) on the availability of farmers with higher-order skills, including management skills, knowledge of financial, marketing and environmental regulatory aspects, and digital know-how (Ryan, 2023^[28]). Medium to high-skilled jobs in agriculture science, mechanics, new farm technologies, and animal and food science could attract young people back to this sector.

Fisheries and aquaculture provide significant inputs into domestic consumption, but are vulnerable to depletion, poor management and climate change

Egypt, Morocco and, to a certain extent, Tunisia boast long coastlines. As such, marine capture fisheries constitute a traditionally important source of nutritious food and of livelihoods. Egypt is a dominant player, providing 73% of aquaculture production in the MENA region (OECD/FAO, 2018^[11]). Capture fisheries have grown significantly over the last decades, too, with Morocco accounting for almost 40% of the region's production (OECD/FAO, 2018^[11]).

The three countries show divergent patterns in trade of fish and fish products. Over 2000-20, Morocco tripled its exports of fish products with imports unchanged while Egypt tripled its imports with exports unchanged. Tunisia shows a gradual increase in both imports and exports of fish and fish products, although imports have outstripped exports (FAO, 2023^[29]).

The key challenges of this sector in all three countries relate to sustainability and climate change. Existing biomass assessments show that most of the fish stock is under pressure. To response, Egypt and Morocco (among others) are increasingly exploring opportunities for inland fisheries. Limited access to appropriate locations, unsustainable production technologies, and inappropriate freshwater fish hatchery installations

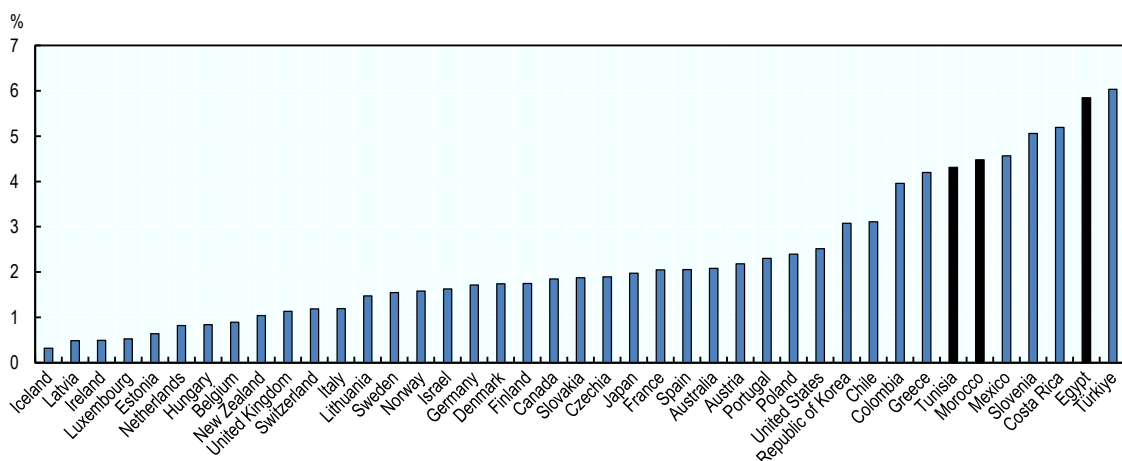
and management, however, restrain both productivity of this sector and its resilience to the climate change and various socio-economic risks. Scarce animal health control systems also undermine the quality of the produce (FAO, 2023^[29]). Leveraging the productivity of this sector will also require (among others) the availability of the right mix of unskilled, skilled and semi-skilled workforce.

Post-harvesting, storage, transportation, logistics and distribution beg for greater investment to stimulate growth across the whole agro-food chain

Post-harvesting and storage are the second node of the agro-food value chain. Transportation, logistics and distribution are somewhat different in that they are integral across different stages, from the farm to manufacturing and from manufacturing to consumption. While these nodes do not employ the greatest number of people nor deliver the greatest value addition, their importance in ensuring food security and sustaining national food systems cannot be underestimated.

Development of appropriate infrastructure for transportation, storage, logistics and distribution is critical to preventing wastage of agriculture produce and food. As such, it contributes to preserving land and water resources and helps improve the value capture of the agriculture production. Food wastage is a particularly problematic issue in perishable segments, such as fruits and vegetables or meat and fish. Losses in perishables can result from mechanical damage, contamination or simply the aging of products (Mukherjee et al., 2013^[30]). In Egypt, Morocco and Tunisia, the share of total food supply lost during storage and transportation is higher than in most OECD countries (Figure 3.7), suggesting that greater gains can be made not only at the agriculture production stage, but also in transportation and storage.

Figure 3.7. The share of total food supply lost during storage and transportation in 2020



Note: The OECD countries with available data were selected. The total food supply is calculated as the sum of total food production and the total food imports quantities.

Source: FAO (2022), FAOSTAT, <https://www.fao.org/faostat/en/>.

Importantly, proper transportation, logistics and distribution integrate all other nodes of the agro-food value chain, which has a major disconnect. Agriculture production is largely a rural activity while food manufacturing and consumption are increasingly urban. At present, these two activities are fragmented due to limited and inappropriate transportation and logistics infrastructure (primarily roads). Additionally, low access in rural areas to energy, telephone connectivity, piped water and basic sanitation facilities preclude greater integration of agriculture production into the higher-value segments of the domestic value chain (OECD, 2021^[2]). In turn, this creates some of the key bottlenecks in smooth development and

functioning of the whole agro-food sector. These bottlenecks also lower the incentives of potential investors to invest into higher value segments of the chain.

In addition to this public infrastructure, all three countries also need to further develop cold storage and warehouse facilities and inland integrated cold chain solutions to preserve the value of perishable high value commodities. This also implies logistics infrastructure including logistics parks and last-mile connectivity, customised transportation and new technologies such as barcoding and radio frequency identification (UNIDO, 2020^[12]).

Both public and private investments in this node of the chain are expected to continue growing in the coming decades. The viability of these projects and the resulting quality will depend (among others) on the availability of a diverse workforce to conceptualise, build, maintain and properly use these facilities.

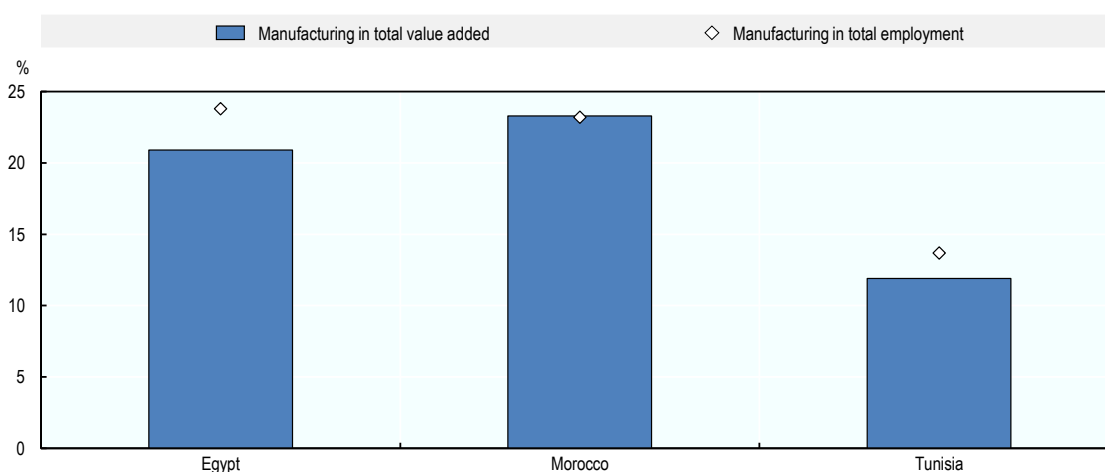
Food processing and manufacturing of food

Food processing and manufacturing of food is the key value-adding node of agro-food value chain. As the main linkage between the farm and the shelf, it offers opportunity to reconcile the challenges of availability, affordability, consumer awareness, quality, safety and access of food (Mukherjee et al., 2013^[30]). Together with agriculture production, food processing and manufacturing of foods represent one of the MENA region's most attractive economic opportunities (UNIDO, 2020^[12]).

The socio-economic importance of the food processing and manufacturing of foods sector cannot be over-estimated

In terms of value added, food processing and manufacturing of food is the top manufacturing industry in Morocco, and ranks second in both Egypt and Tunisia (Figure 3.8). In terms of employment, it is the top industry in Egypt and second in Morocco and Tunisia. These rankings make it a strategically important sector for the socio-economic wellbeing of all three countries (UNIDO, 2023^[31]).

Figure 3.8. Economic significance of food processing and manufacturing of foods in 2020



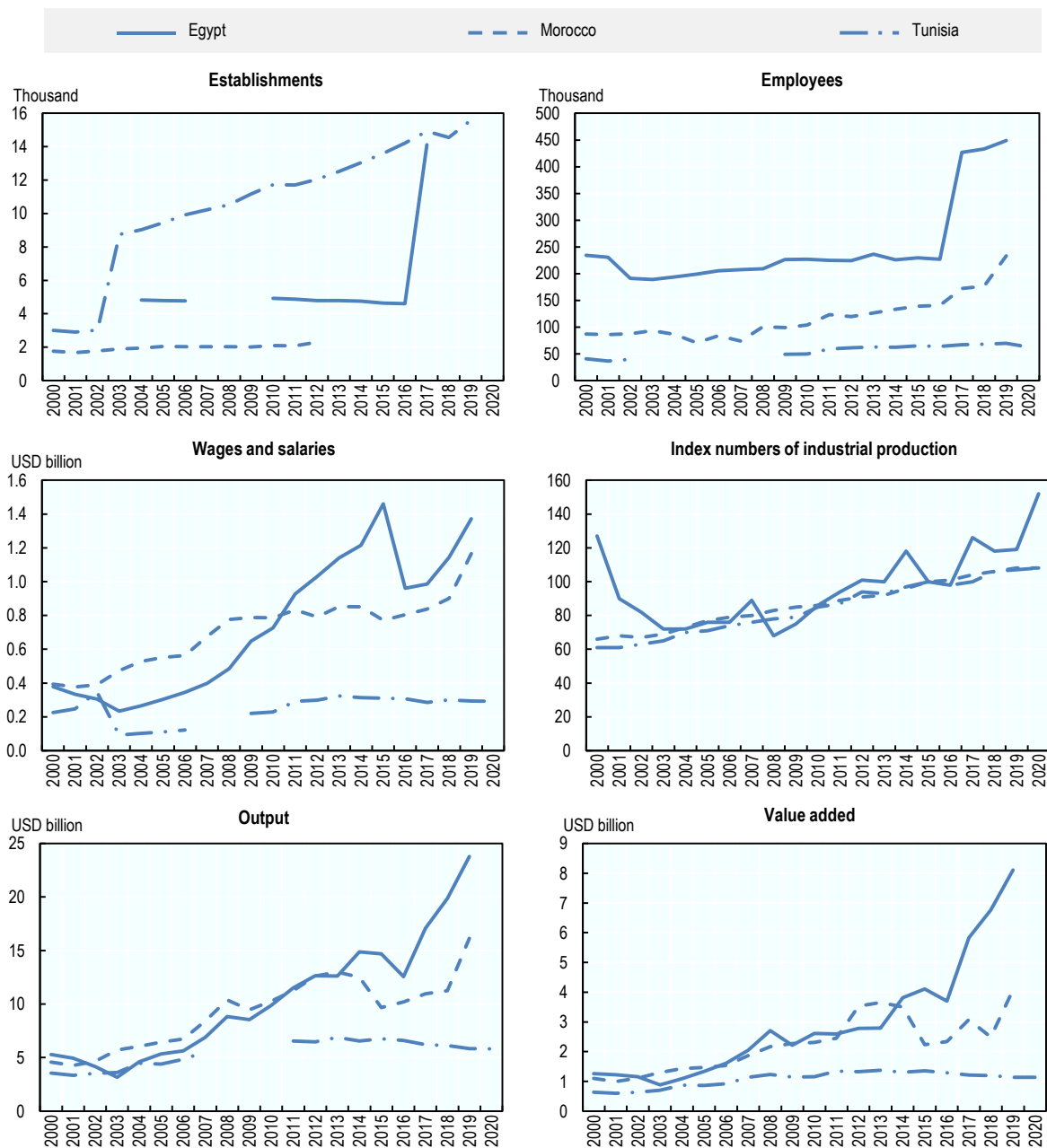
Note: The indicator for manufacturing of food in total value-added measures the contribution of manufacturing of food, beverages and tobacco to a country's economy as a whole.

Source: UN (2022), UNIDO, <https://iap.unido.org/data/country?p=MAR>.

This sector has shown significant growth since the turn of the century – especially in Egypt and Morocco – in terms of the number of enterprises, employees, output and value added, as well as in wages and salaries

(Figure 3.9). In Egypt, the sector received a significant financial stimulus package from the Central Bank of Egypt in 2019, to boost its growth, productivity and competitiveness (Al-Habbal, 2020_[32]).

Figure 3.9. Food and beverage production sector growth, 2000-20



Note: The food and beverages sector is defined according to ISIC Revision 3 UN classification. Index numbers of industrial production are used to express the relative change in the value of the Index of industrial production (which measures the output of economic activities) over time. An “establishment” is ideally a production unit that engages, under a single ownership or control, in one (or predominantly one) kind of activity at a single location; e.g. a workshop or factory. The number of employees is intended to include all persons engaged other than the working owners, active business partners and unpaid family workers. Wages and salaries include all payments in cash or in kind paid to “employees” during the reference year in relation to work done for the establishment.

Source: UN (2023), *UNIDO Data Portal*, <https://stat.unido.org/>.

Dietary changes will continue stimulating demand for diverse food products, requiring sophistication of food processing and manufacturing

As trends from other parts of the world show, rising incomes and urbanisation are likely to trigger increased demand for more diverse and higher added-value nutritious food products throughout the MENA region. It is expected that, in the near future, demand for processed food will outpace that for traditional staples (Reardon et al., 2019^[33]). This will require sophistication of food processing and manufacturing.

Examples from the rest of the world show that, different types of agriculture production may include one, two, three or even more stages of processing (Table 3.3), which may happen at different locations. In MENA, many of these processing stages either do not yet exist, or they are under-developed, or they may be performed within the same enterprise, while actually better specialisation may sometimes increase efficiency. As a result, there are untapped opportunities to develop these various processing and production stages in the region, with the view of creating greater value and employment opportunities. With current limitations observed in post-harvesting, storage, transportation, logistics and distribution, a strong rationale exists for developing these stages of food processing close to the place of agriculture production, i.e. in rural areas.

Table 3.3. Stages and examples of food processing for selected types of agricultural produce

	Primary processing	Secondary processing	Tertiary processing
Fruits and vegetables	Pre-refrigeration, classification, washing, sanitising, drainage	Selection, peeling, cutting, blanching, packaging	Production of jams, juices, sauces, conserved food, pre-cooked meals
Grains and cereals	Cleaning, grading, hulling, milling, pounding, grinding, tempering, parboiling, soaking, drying, sieving	Fermentation, baking, puffing, flaking, frying, extrusion	Production of ready-to-eat breads, pastry, pasta
Dairy products	Filtering of milk or colostrum on premises at which the animals were milked	Production of cottage cheese, cream, dried milk, butter	Production of yoghurts, spreadable fats, inputs into pre-cooked meals
Meat and poultry	Sorting, cutting, chopping, comminuting	Mixing, tumbling, salting, curing, utilisation of spices, non-meat additives, stuffing, filling into casings or other containers, fermentation, drying, heat treatment, smoking	Ready-to-eat, pre-cooked meals
Marine products	Peeling, de-heading, deveining, applying heat treatment or preparing fish for sale in any other manner that does not include cleaning, icing, freezing	Filleting, smoking, salting, marinating, pickling, drying, cooking, shucking, comminuting, buttering, breading, stuffing	Ready-to-eat
Edible oil	Heating, storing, extraction, clarification	Refined oils, packaging	Fortified oils

Source: Authors' compilation based on: FAO (2007), Oilseeds, www.fao.org/3/a-au139e.pdf; FAO (2007), Post-harvest, www.fao.org/3/au162e/au162e.pdf; FAO (2007), Post-harvest processing, www.fao.org/3/au104e/au104e.pdf; FAO (2007), Meat processing technology, www.fao.org/3/ai407e/ai407e.pdf; NEW BRUNSWICK (2009), Seafood Processing Act, <https://faolex.fao.org/docs/pdf/nb95747>; CCOHS (2022), www.ccohs.ca/oshanswers/occup_workplace/fish_pro.html; Australia New Zealand Food Authority (2009), Primary Production and Processing Standard for Dairy Products, www.foodstandards.gov.au/code/userguide/documents/WEB%20Dairy%20Processing.pdf.

In the MENA region, dietary changes are expected to include a nutritional transition towards higher calorie intake together with the maintenance of certain features of the Mediterranean diet (INRA/Pluriagri, 2015^[34]). Daily caloric intake has been on the rise already, starting from 2000, along with a progressive reduction in consumption of traditional cereals (INRA/Pluriagri, 2015^[34]). In parallel, the share of animal foods in consumption has been rising, driven by a higher consumption of meat, fish and dairy products (OECD/FAO, 2018^[1]).

Within meat production, poultry meat dominated the sector in the MENA region throughout the 2010s. Investment in both livestock production facilities and food transformation and packaging are expected to grow across the region throughout the 2020s, with Egypt being the leader (OECD/FAO, 2018^[1]).

In the fish and aquaculture sector, primary processing activities are increasing to meet evolving consumer demands in both domestic and exporting partner markets. They involve peeling, de-heading, deveining and cutting of fish and aquaculture produce, which occurs in both large-scale, industrial processing plants and in small farms and peeling sheds. Additional value-added processing includes packaging and branding; use in pre-prepared foods; or special freezing to sustain long transportation and storage (ILO, 2023^[35]). As countries, especially Morocco and Egypt, pursue greater consumption and exporting of fisheries produce, it would be important to support greater domestic value creation in this sector as a complement to simply exporting fresh capture.

In richer countries of the MENA region, and particularly in urban zones, dairy markets are growing for processed products such as butter and cheese. In the coming decade, Egypt is expected to continue being the second-largest producer of milk in the region, with half of milk collection being transformed into butter, cheese or milk powder (OECD/FAO, 2018^[1]).

A significant increase in the importance of vegetable oils and sugary foods in the diet has also taken place, stimulating demand for sugar and oil production (and imports). Egypt has been pioneering sugar beet production in the region, expanding both cropped areas and sugar manufacturing facilities.

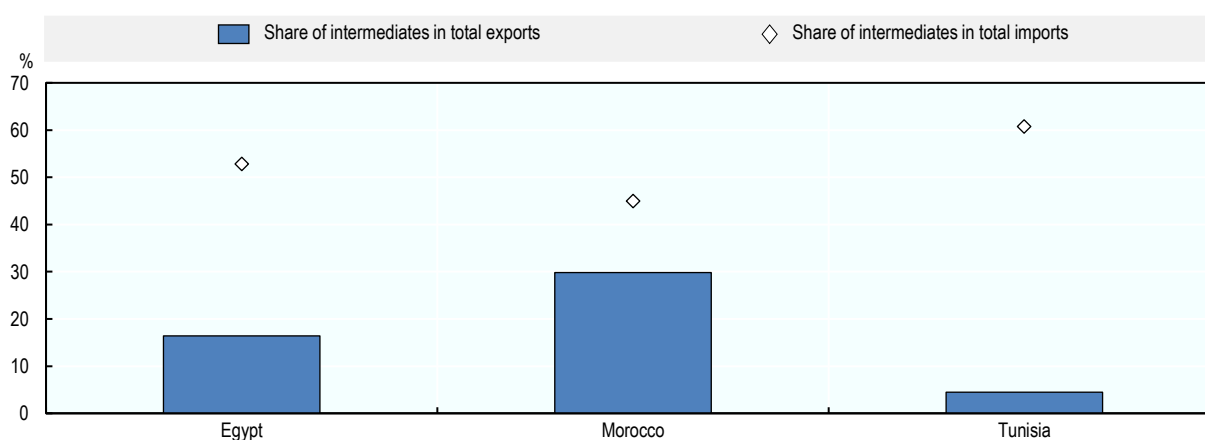
Immense opportunities exist to create value addition domestically in this sector

The economic viability of the food processing and manufacturing sector relies on the availability and the quality of inputs, which include primarily agriculture production, packaging materials, equipment and skilled labour.

In terms of agricultural inputs, Egypt, Morocco and Tunisia heavily rely on the imports of intermediates, as opposed to the locally produced intermediates (Figure 3.10). Moreover, they import more intermediates than they export, suggesting that, in this node of the supply chain, foreign backward linkages are more important than forward linkages. Even if some agriculture inputs are produced domestically, the region's food manufacturers depend on additional imported food ingredients, such as oil and sugar (in particular) (OECD/FAO, 2018^[1]).

Between 1995 and 2020, Egypt and Morocco showed a decline in the imports of intermediates into the food and beverages manufacturing sector, indicating increasing self-sufficiency. Nevertheless, the share of intermediates in total imports in this sector was over 45% in both countries in 2020 (UNIDO, 2023^[31]). Over the same period, both countries showed an increasing trend in the share of intermediates in total exports of this sector, highlighting their deeper integration into the global value chain. In contrast, Tunisia shows a growing dependency on imported intermediates in food and beverage manufacturing, which rose from 50.1% in 1995 to 60.8% in 2020. Over the same period, the share of intermediates in total exports declined to just 4.5% (UNIDO, 2023^[31]).

Figure 3.10. Integration into global value chain of manufacturing of food and beverages, and tobacco sector in 2020



Note: The indicator for share of intermediates in total imports measures the share of intermediates in a country's manufactured imports. The more a country relies on imported (instead of domestic) inputs for production, the higher its share of intermediates in manufactured imports will be.

Source: UN (2022), *UNIDO Industrial Analytics Platform Database*, <https://iap.unido.org/data/country?p=MAR>.

As a result of this dependence, many unexplored opportunities exist to create domestic value addition to domestically produced agriculture products – and with it employment. Moreover, and again, high dependence on external intermediaries increases vulnerability to external shocks related to their direct supply and their prices. Localising production of some of the inputs, with the view of exporting more processed intermediates and final goods, is an option that needs to be given more policy attention.

At present, many structural deficiencies prevent the MENA region from fully capturing this growth potential

One reason these opportunities are not fully captured is high fragmentation of the agro-food sector in the MENA region, which is dominated by SMEs. This often results in poor economies of scale and limited capacities to establish strong links with producers and processors. Egypt, for example, has more than 10 000 registered food production and processing businesses, mostly SMEs (Al-Habbal, 2020^[32]). In Morocco, across 2 050 registered enterprises in the food processing sector, 85% have fewer than 20 employees (Fardaoussi and Wright, 2022^[36]). The limited financial and investment capacities of these structures is often coupled with poor equipment, poor quality and safety of food production, and lack of traceability standards. All of these constraints result in sub-optimal quality of production and packaging, and subsequent direct losses of agricultural produce and low value addition. As a result, the sector remains underserved and growing domestic demand for processed and manufactured products is largely underexploited. These factors preclude many workers (especially young), enterprises and societies more generally from fully capturing the sector's opportunities (OECD, 2018^[9]).

Inconsistent quality of inputs, especially those produced locally is another shortcoming. This concerns agriculture inputs (the quality of which may vary depending on cultivation practices), availability of modern machinery, and availability of infrastructure and practices for cultivation, harvesting, transportation and storage (UNIDO, 2020^[12]).

Finally, the shortage of qualified labour force is another critical bottleneck. The successful functioning of the sector depends on a large number of a wide range of qualified specialists such as laboratory and factory technicians; engineers; safety and quality assurance officers; food scientists; and production managers and supervisors. To ensure operational ability of the sector and improve its productivity, qualifications are critical in food quality and food safety, hygiene, quality assurance, packaging and

processing, as well as in strategic planning, operation optimisation, risk management, and marketing and sales (domestic and international) (UNIDO, 2020^[12]). Many of these new positions are already held by women, signalling a strong potential for jobs in this sector to improve female labour force participation (IBRD/WB, 2007^[37]; Mithiya, Mandal and Bandyopadhyay, 2018^[38]).

Consumption sector: retail sale, restaurants and catering

The food retail sector has shown rapid expansion and transformation over the past two decades

The growth of the modern food retail sector is closely related to urbanisation. Today, more people live in urban than in rural areas in Egypt, Morocco and Tunisia. The process of urbanisation will continue as people move from rural to urban areas and urban areas experience natural population growth (OECD/UN-Habitat, 2022^[39]). In developing regions overall, over 60% of the urban population currently lives in cities and towns with fewer than 1 million inhabitants (OECD/UN-Habitat, 2022^[39]). As such, food systems that serve small and intermediate cities will be as important as those in large megapolis to meet food demand and improve livelihoods through the food system (Bereuter, Glickman and Reardon, 2016^[40]).

Rates of urban food consumption often outpace urbanisation rates, with an urban resident consuming a larger share of the total value of food as compared to a rural resident (Bereuter, Glickman and Reardon, 2016^[40]). Reflecting this demand, over the last few decades, the food retail sector of the MENA region has undergone a true revolution (Bereuter, Glickman and Reardon, 2016^[40]; Reardon et al., 2019^[33]), driven by a dramatic expansion of modern distribution outlets, supermarkets and hypermarkets through joint ventures with foreign investors. Between 2003 and 2017, modern food retail sales grew by 181% in the MENA region, corresponding to an average annual growth rate (AAGR) of 7.7% (Bahn and Abebe, 2020^[41]). By comparison, traditional food retail sales grew by only 36% over the period 2003-17, an AAGR of just 2.3% (Bahn and Abebe, 2020^[41]). As a result, the share of modern food retail sales within total sales increased from 23.9% to 39.3% in the region (Bahn and Abebe, 2020^[41]).

In Egypt, the retail food market was worth over USD 17.5 billion in 2019 (Al-Habbal, 2020^[32]). Most of the demand for local goods was driven by middle- and low-income consumers. With 96% of all outlets and almost 80% of all sales in Egypt, traditional stores continue to dominate the retail food market. At the same time, both the quantity and the volume of sales of modern retail establishments are increasing. During 2020-25 period, the sector's growth is predicted to reach 15-20% (Al-Habbal, 2020^[32]).

In Morocco, the food retail sector is a key pillar of the economy. It employs more than 1.59 million people of which over 1.27 million are in urban areas, making it the top employing sector in urban areas. In 2019, the number of medium and large supermarkets was 645 (Fédération du Commerce et Services, 2020^[42]).

Many of these food retail entities – both public and private – compete among themselves not only on price but also on quality, diversity of products, food safety, and meeting phytosanitary and environmental standards of products (Reardon, Timmer and Berdegue, 2004^[43]). This drives demand for products corresponding to these requirements from both foreign and domestic suppliers, presenting an opportunity for domestic suppliers to upgrade their products to meet this demand. It also confirms demand for workers with a variety of profiles and skills, ranging from cashiers and sellers to food preparers, product and line managers, technicians and facility maintainers, and quality controllers as well as managers and supervisors of inventory, budgets, and planning and outsourced subcontractors. Many of these professions represent attractive employment options for women.

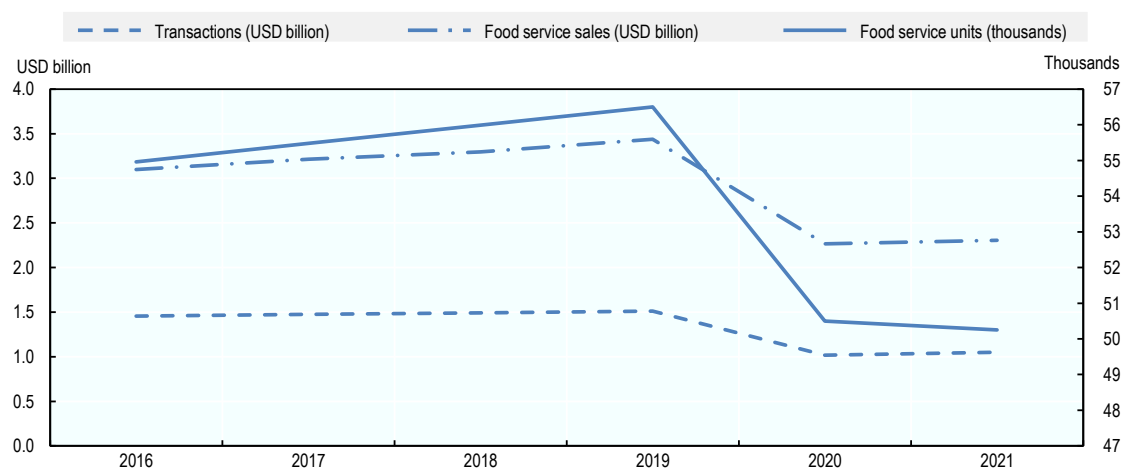
The sector continues experiencing important transformations, especially under the effect of COVID-19 during which movement restrictions fuelled the growth of online food purchases, leading to many closures (International Trade Administration, 2022^[44]).

The importance of food away from home is also growing

Many MENA countries have been experiencing rapid growth of the middle class. The “global middle class” is defined as individuals living with USD 10-100 per capita, per day, in purchasing power parity, expressed in 2005 dollars (Kharas, 2017^[45]). Growth of the middle class, coupled with urbanisation, is strongly associated with increased spending on quality food products and services. In many developing countries with available data, middle-class households spend three to four times more on restaurants than poorer households (OECD, 2021^[2]). Such higher consumption is driven not only by “pleasure” consumption, but also by the fact that higher urban wages increase the opportunity costs of cooking for personal consumption (FAO, 2017^[46]). Similar patterns can be expected throughout the MENA region. Ahead of the COVID-19 pandemic, the foodservice industry in MENA benefited from booming and expanding tourism.

In Egypt, in 2019, more than 40 605 restaurants showed average sales growth of 14% from the preceding year (Beillard, 2020^[47]). In Morocco, the restaurant service industry was valued at USD 3.3 billion in 2019 (Figure 3.11), at the peak of its growth. Being hit hard by COVID-19 pandemic, the sector is experiencing a slow recovery, especially in both quick- and full-service restaurants (Fardaoussi and Wright, 2022^[36]).

Figure 3.11. Restaurants and retail selling in Morocco, 2016-21



Source: USDA (2022), *Food Service - Hotel Restaurant Institutional, Rabat Morocco MO2022-0023*, https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Food%20Service%20-%20Hotel%20Restaurant%20Institutional_Rabat_Morocco_MO2022-0023.

Key policy messages

As this chapter shows, the agro-food value chain represents one of the MENA region’s most attractive economic opportunities, including for creating jobs across the entire value chain. Still, countries must reflect seriously on how to strengthen current agricultural policies to ensure food security and sustainable decent employment creation.

Domestic agriculture production is the oldest and most traditional node of the agro-food value chain. It will continue to absorb large shares of low-skilled labour in the MENA region, and remain an important entry point for young workers. However, as this sector is evolving under the array of demographic, environmental and climate changes – as well as external factors related to world prices and export disruptions – to ensure its sustainability and competitiveness, policy action is needed to ensure the sector can adapt to these numerous challenges. Much of this adjustment would need to be stimulated through improved productivity and labour adjustments. While total demand for labour in agriculture production will decline in the coming

decades, demand will rise for semi-skilled and highly-skilled specialists, with a diverse set of skills, although at divergent rates across different sub-sectors of agriculture. This will occur in the context of various other transformations, such as adoption of climate-smart agriculture, changes in average farm size, ownership structures, a transition from family to hired labour, testing phases of new types of agriculture produce, modern mechanisation, and introduction of new technologies and innovation. To ensure that employment in the sector remains an attractive option, especially for younger generations, these changes need to be underpinned by effective policies.

The food manufacturing and food processing sector will experience the greatest transformations in the nearest decades. Their sub-sectors have strong potential to substantially contribute to rural development and the development of small and medium-size cities. In turn, they could absorb some of the largest shares of the semi-skilled workforce, including young people and women, with the positive effect of raising their incomes. Current bottlenecks for development of these sectors include fragmentation, missing segments and sub-segments of the chain, limited capacities of small and medium enterprises (SMEs), inconsistent quality of domestic inputs, and shortage of qualified labour with specific technical and managerial skills. Clearly, capturing the socio-economic potential of the sector would require strategic public and private planning, investment, orientation, and policy co-ordination.

While the post-harvesting, storage, transportation, logistics and distribution sectors have relatively modest employment potential, their role in the smooth functioning and development of the whole agro-food value chain cannot be underestimated. As such, its success will also depend on being able to attract the right workforce and the right investment to ensure smooth development.

Finally, food consumption, whether retail or restaurants, is expected to expand in the MENA region. It has already contributed to the absorption of a large chunk of the urban population, including women and young people. Its role will continue growing, especially in medium-size cities.

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4 Connecting the dots: Turning the agro-food sector into an engine for youth socio-economic empowerment

The two previous chapters of this report explore aspects of the current reality in the MENA region that hold high potential but currently suffer a disconnect. On the one hand, the region has an abundant and growing youth labour force (Chapter 2), which predominantly has medium level of skills and a desire to have good jobs and working conditions. On the other hand, growing demand for food products and changing consumption patterns of a growing middle class are creating challenge in relation to optimal resource use and greater value addition in the agro-food sector (Chapter 3). Untapped opportunities exist to better align these areas such that the agro-food sector helps to solve the youth employment problem and improve the well-being of young people and their families, while also ensuring that societies more broadly can reap the socio-economic benefits of the demographic dividend in the region.

To unleash this potential, a certain vision of the agro-food sector is needed, with a specific focus on creating attractive employment options for young people. This vision relies on strategic decisions, investments and policy actions that need to be implemented already now (Kolev and Rim, 2019^[1]).

Skill development for young people is vital to this vision, to match them with available and future jobs that will become in demand as the agro-food sector continues to develop (Table 4.1). Indeed, unavailability of labour is not a problem in the MENA region – workers are abundant. Yet a shortage of qualified labour with the right skills is a key bottleneck to development of the agro-food sector, undermining productivity and competitiveness of the entire value chain in the region (UNIDO, 2020^[2]).

To support development of such a vision, this chapter outlines a non-exhaustive set of actions that governments could implement, with a focus on skills and labour market policies targeted at both:

- future young entrants into the agro-food labour market
- young people already on the labour market.

These policies need to be aligned with complementary policies to support businesses, increase the attractiveness of the sector and provide better working conditions for workers in it.

Another no less important aspect of this vision includes developing the agro-food value chain itself, with the aim of generating attractive jobs that can absorb a greater share of existing labour. Some expansion of productive capacities throughout the value chain will occur automatically. However, the role of national and local governments will remain paramount in channelling new production to where its socio-economic impact would be the greatest (such as in small and medium-size towns that can absorb abundant young low-skilled and semi-skilled labour, while improving incomes and stimulating regional development); investing into larger agro-food value chain projects that will otherwise remain underdeveloped; investing

into infrastructure to improve rural-urban linkages; supporting the adoption of new technologies; adopting necessary food safety and environmental laws and standards (OECD, 2021^[3]).

Table 4.1. Examples of the types of jobs for which demand is expected to increase as agro-food chains develop

Node of the agro-food chain	Occupational and sectoral needs	Skills demanded	Ways to acquire necessary skills
Domestic agriculture production	Versatile workers on modern farms	Foundational skills (reading, writing, numeracy) Cognitive and meta-cognitive skills including analytical and critical thinking, teamwork Basic and medium technical skills specific to the job	Primary and secondary education Formal and informal on-the-job training
	Farmers, contributing family members and hired workers who improve cultivation processes through use of better machinery	In addition to the above: Technical skills to operate new machinery	In addition to the above: Technical and vocational education and training (TVET) Short-term courses, including those funded by the employer, farmer co-operatives or public employment services
	Farmers, contributing family members, and hired workers who implement new technologies (e.g. precision agriculture; water plant technicians; sensor and solar energy engineering technicians; green technologies; organic production)	In addition to the above, the mix of: Highly specialised technical skills to use these technologies (e.g. calibrate application of herbicides, pesticides, irrigation and fertilisers to avoid overuse or underuse) Technical knowledge of soil and water management, crop rotation systems, organic production methods, implementation of bio- and nanotechnologies, etc. Cognitive and meta-cognitive skills including creativity, problem-solving and decision-making Digital skills (e.g. ability to apply remote sensing; use digital soil maps, satellite imagery, geographic information systems (GIS) and global positioning systems)	In addition to the above: Paid apprenticeships / dual apprenticeships University degrees, including in cross-specialisations Reskilling and upskilling through long-term vocational training courses Significant formal on-the-job training Non-formal and informal digital skills acquisition, including through massive open online courses (MOOCs)
	Farmers to enhance economies of scale through cooperatives, but also increasing farm size	In addition to the above, the mix of: Management skills; knowledge of bookkeeping, tax, financial, marketing, environmental, labour and regulatory aspects; risk management, strategic planning, and responsible business conduct Social and emotional skills, including communication, collaboration and teamwork, conflict resolution and negotiation	In addition to the above: Reskilling and upskilling through longer-term specialised training courses and programmes Non-formal and informal skills acquisition
Post-harvesting, storage, transportation, logistics, distribution	Diverse workforce to conceptualise, build, maintain and properly use these facilities; storage and distribution managers	Highly specialised technical skills (e.g. engineers; technicians)	Specialised university degrees (e.g. in engineering; TVET and dual apprenticeships)
Food processing and manufacturing of food	Agripreneurs	Management skills, knowledge of bookkeeping, tax, financial, marketing, environmental, labour regulatory aspects, risk management, strategic and business planning, responsible business conduct, knowledge of the agro-food industry and market demands	Secondary and tertiary education, TVET
	Workers in primary processing	Basic technical skills specific to the job	Primary and secondary education Formal and informal on-the-job training

	Workers in secondary processing	Basic and medium technical skills specific to the job	Primary and secondary education Formal and informal on-the-job training TVET, paid apprenticeships / dual apprenticeships
	Workers in tertiary processing (e.g. plant workers, manufacturing and packaging managers)	Full range of technical skills specific to the job	In addition to the above: Specialised qualifications, such as in processing, packaging, etc.
	Other functions in food production	Specialised technical skills (laboratory and factory technicians) Highly specialised technical skills (engineers, safety and quality assurance officers, food scientists, etc.) Management and supervisory skills	TVET and specialised university qualifications in food quality, food safety and quality assurance; biology; hygiene; engineering, strategic planning, operation optimization and risk management; domestic and international marketing and sales, including digital marketing; R&D; managing international distribution channels; intellectual property; etc.
Retail, restaurants, catering	Cashiers, sellers, waitress	Foundational skills (reading, writing, numeracy) Basic technical skills specific to the job	Primary and secondary education Formal and informal on-the-job training
	Food preparers (e.g. cooks)	Specialised technical skills	TVET, paid apprenticeships / dual apprenticeships Specialised courses MOOCs Formal and informal on-the-job training
	Product and line managers	Medium technical skills specific to the job Social and emotional skills, including communication, collaboration and teamwork, conflict resolution and negotiation	TVET, paid apprenticeships / dual apprenticeships General university degrees
	Technicians and facility maintainers	Specialised technical skills	TVET, paid apprenticeships / dual apprenticeships
	Quality controllers; managers and supervisors of inventory, budgets, planning, contracting; domestic and international marketing specialists; consumer psychologists and behavioral scientists	The mix of: Specialised technical skills in relevant domains Management and marketing skills Social and emotional skills, including communication, collaboration and teamwork, conflict resolution and negotiation Digital skills	General and specialised university degrees in relevant domains

Note: These examples are taken from other countries at more advanced stages of agro-food chain development. The exact skill demand is not quantified and is left to the national skill anticipation observatories.

Source: Authors' compilation.

Policies for future young entrants into the agro-food labour market

Ensure future workers are equipped with solid foundational, cognitive, social and emotional skills as a pre-condition for building all other skills

Foundational skills, such as reading, writing and numeracy, are the basis on which all other technical, work-specific and job-specific skills can be built. They are relevant in the whole range of occupations in the agro-food sector (Box 4.1.). Foundational skills are generally acquired throughout childhood and adolescence, and the role of primary and secondary schools in developing these skills remains paramount. Critically, these skills make further learning possible.

As shown in Chapter 2, Egypt and Morocco and, to a certain extent, Tunisia all have a high share of young people who have only secondary or even primary schooling. While this may seem sufficient for certain

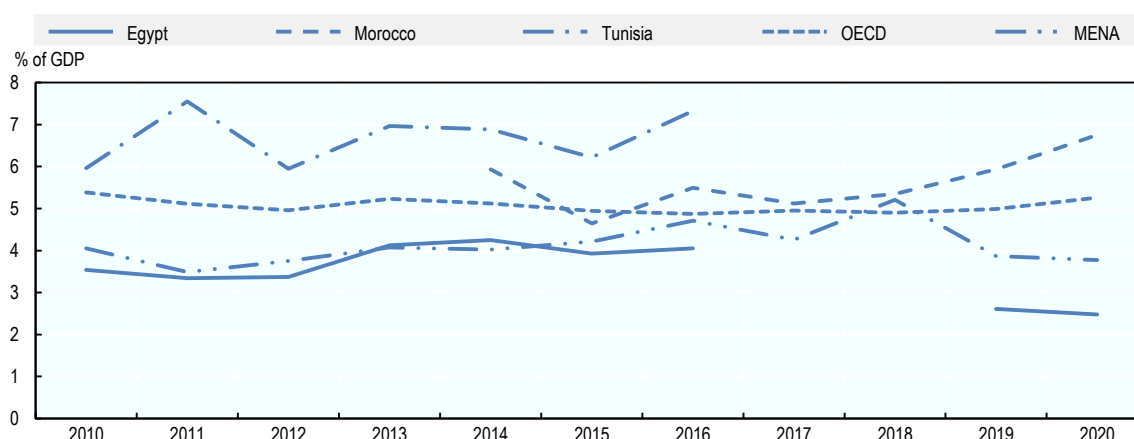
jobs, often it is undermined by poor quality of schooling. Moreover, dropout rates remain significant, meaning that not all students acquire good quality foundational skills. Poor quality of compulsory schooling and high dropout rates both disproportionately affect those students who are already disadvantaged – typically those living in rural areas, from poor informal households (Aleksynska and Kolev, 2021^[4]), and with few options for employment outside of family businesses, mainly in agriculture. As a result, these future workers often become trapped in the intergenerational cycle of informal work that is low-skill and low-productivity, particularly in the agriculture production sector (OECD/CAF/ECLAC, 2016^[5]). Both phenomena also contribute to skills shortages and become major barriers to public and private sector strategies for industrialisation, adoption of new technologies, boosting productivity, and upgrading any segment of the agro-food value chains.

This makes it important to continue devoting efforts to ensure, as a minimum, that all future workers have universal access to good quality primary and secondary education; that access to education is equal for boys and girls, across urban and rural areas, and for children from vulnerable and non-vulnerable households (UNESCO, 2017^[6]). Other key areas for action include eradicating child labour by raising and enforcing minimum age for employment; instituting and enforcing free and compulsory education; and making quality education available in rural areas (Doepke, 2018^[7]).

Improving education quality and preventing drop-outs are essential for building basic foundational skills across a larger pool of would-be workers. In addition to these skills, education systems should, starting from very early on, also be able to deliver skills related to analytical thinking, problem-solving and innovation, particularly in for occupations in science, technology, engineering and mathematics (STEM). Social and emotional skills – such as communication, collaboration, teamwork, conflict resolution and negotiation as well as adaptability, curiosity and a learning mindset – will help students maximise the ability of humans to add value beyond that of machines in the future to work (OECD, 2015^[8]). These skills will be in particular demand for all workers, including in the agro-food sector as it undergoes structural transformation, farms and enterprises grow in size and adopt new technologies, demand grows for climate-smart and organic farming, markets expand, and the sector deals with emerging challenges such as climate change.

Raising the level and the quality of schooling is vital to deliver these skills – and requires substantial resources. In Egypt, government spending on education remains low (Figure 4.1) (UNESCO, 2021^[9]). This undermines the ability to attract qualified individuals to the teaching profession and to improve the quality of teaching. Lack of investment in renovating existing and/or creating new educational infrastructure and supporting materials also impedes progress in schooling performance (OECD, 2016^[10]). Often in the MENA region, more spending is devoted to primary schooling than to secondary and tertiary levels. While this is helpful to boost general literacy, as economies seek to develop, to further enhance workers' skills, it would also be important to boost spending on post-primary education (UNESCO, 2021^[9]). The COVID-19 pandemic has put strain on public resources, with many MENA countries cutting their public education budgets in its aftermath (Global Education Monitoring Team and World Bank, 2021^[11]). In this context, it is important that governments devote adequate expenditure to education, reverting to previous levels or even increasing where needed.

Figure 4.1. Government expenditure on education during the 2010-20 period



Note: In this graph, the MENA region includes the following countries: Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Palestinian Authority, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates and Yemen.

Source: World Bank (2023), *World Development Indicators*, <https://data.worldbank.org/indicator/SE.XPD.TOTL.GD.ZS?locations=EG MA TN OECD&page=2>

In very poor settings, governments also need to devote resources to decrease the share of education-related expenses paid by households (OECD, 2024 (forthcoming)^[12]). Even if education is free, for many, going to school is not. This is especially important for poor households in rural areas with family members often already informally employed in agriculture. For such families, the burden of education on household expenditure may be particularly heavy and may impede progression in enrolment rates of children, ultimately impeding the inter-generational transition out of poverty and informality. Governments should therefore pay particular attention to providing education subsidies to such families, for example through in-kind or cash transfers designed to ensure that families can buy books, school materials and clothing. Some subsidies also support nutrition and health by providing school meals, in an inclusive manner.

Preventing school drop-out is important to allow pupils to gain the necessary foundational skills and to help them enter a labour market with a certified credential (diploma). Additionally, it is easier to reduce the skills gap for young people who are still in school, rather than trying to do so later in their working life (OECD, 2021^[13]). Often, prevention of school drop-out needs to be coupled with providing subsidies to the families to keep their children in school or providing scholarships to best-performing students. In Egypt, Morocco and Tunisia, decisions to keep children and adolescents in school are often made within the family, based on the calculated probability that staying in school will actually lead to a job relative to the need to have children participate in providing income to the family. Thus, again, improving school quality and aligning school programmes with the needs of the labour markets are very important.

Smoothing school-to-work transitions by investing into modern technical skills delivered through TVET

A wide range of jobs in the agro-food sector requires technical skills that do not require university degrees and thus are best delivered through post-secondary education and training (Table 4.1. Examples of the types of jobs for which demand is expected to increase as agro-food chains develop). At present, the key bottleneck is a major gap in the workers having the right technical skills. As the agro-food sector develops, accompanied by increased digitalisation, mechanisation, automation, specialisation and quality sophistication, workers who currently have only foundational skills will need to acquire a broad range of higher-order technical skills.

Farmers, for example, must learn how to grow and test their products to meet quality and health standards, environmental and sustainability imperatives. They should also learn techniques related to new ways of cultivation, including climate-smart and organic. Increased consumption of new types of processed foods in Egypt, Morocco and Tunisia has created growing demand for new skills in pastry, gastronomy or cheese-making. Another arising need will be for niche markets such as the use of olive oil in cosmetics or pharmaceuticals or the combustion of waste products for energy production.

In this regard, technical and vocational education and training (TVET) systems, dual apprenticeship skills, and paid apprenticeship programmes have the strongest potential to solve the youth unemployment problem. By increasing youth employability in the agro-food sector, while also satisfying demand for specialists in the agro-food sector, TVET systems can help the sector develop and flourish.

As shown in Chapter 2, TVET systems are far from being explored to their maximum potential across the MENA region. Often, they lack resources, deliver low quality of training that is poorly adapted to labour markets needs and offer insufficient choice as to fields of study. In turn, they are characterised by high drop-out rates and suffer from low status and poor reputations, which may penalise graduates (OECD, 2015^[14]). In all three countries, radical improvement of TVET – to make it more flexible and adaptable to current and future skills needs – is a priority. This means establishing new vocational schools dedicated to specific fields, providing more laboratories for practical work and using of variety of tools and mechanisms to deliver skills. MENA countries are recognising these problems and taking steps to improve the quality of skills delivered through TVET, as well as through other learning systems (Box 4.1). Notably, as part of the Green Morocco Plan (launched in 2008), Morocco has established the Agricultural Professional Training Programme and created a new generation of modern training centres.

Box 4.1. Reform agenda to improve the quality and relevance of education for labour markets

In Egypt, the government recognised the need for more flexible pathways between general and technical education, with multiple entry points leading to internationally recognisable outputs. It launched a reform agenda focused on increasing access to and raising the quality of education, developing assessment systems, and improving the quality of instruction, including incorporating technology.

In 2006, the government established a National Authority for Quality Assurance and Accreditation of Education (NAQAAE). In 2021, it passed legislation to create an Authority for Quality Assurance and Accreditation of Technical and Vocational Education and Training. Other initiatives include creating a National Qualifications Framework Law that calls for a National Strategy for Lifelong Learning, a National Qualification Framework (Eg-NQF), and a national system for recognition, validation, and accreditation (RVA). Part of the aim is to recognise prior learning (RPL), integrate non-formal, informal, and formal learning, and enable transfer to labour markets of knowledge, skills, and competencies acquired through different forms of education and training. With the view to better co-ordinate the TVET system, the government is also exploring the revival of a Supreme Council on Human Resources.

Currently, the Egyptian formal, work-based learning system (including apprenticeship) encompasses several schemes that comply with the International Labour Organization (ILO) definitions for apprenticeship (ILO, 2017^[15]). Integrated TVET schemes are now developed under the Ministry of Education in collaboration with public and private companies (Joint School Initiative) in which the learner is considered a student within programmes that last three years. With the intermediation of Ministry of Education, the apprentices enter into a contractual agreement with the private company. Programmes for agriculture and food processing occupations are offered among others. Apprentices typically enter the system at the age of 15, after successfully completing compulsory education. At the end of the three years, graduates receive a technical education diploma and a practical experience certificate from the

company. The apprentice has additional educational opportunities such as entering middle technical institutes or, in case of the best 5% of achievers, an opportunity to enter university.

In Morocco, the Ministry of Education, Vocational Training, Tertiary Education and Scientific Research adopted, in 2016, a National Vocational Training Strategy for 2021, launched by the signing of programme contracts with various TVET operators. The Strategy is an integral part of 23 priority measures of the 2015-30 strategic vision for reform of the Higher Council for Education, Training and Scientific Research (CSEFRS), which aims to ensure and guarantee education for all and life-long learning. Since 2008, the Green Morocco Plan has secured agriculture's place as a national priority. In 2020, His Majesty the King launched the "Green Generation 2020-2030" programme, reinforcing the importance of the original Plan. To modernise and enhance the competitiveness of the agricultural sector, the Plan includes the creation of the Agricultural Professional Training Programme, which focuses on providing qualified resources and improving the skills of rural youth (Ministère de l'Agriculture, de la Pêche Maritime, du Développement Rural et des Eaux et Forêts, 2023^[16]). The Programme aims include establishing a National Office for Agricultural Vocational Training, creating a new generation of multi-centre training hubs, upgrading infrastructure, diversifying training offerings, adopting competency-based approaches, and fostering partnerships with professional organisations (Ministère de l'Agriculture, de la Pêche Maritime, du Développement Rural et des Eaux et Forêts, 2023^[16]). Covering the entire territory of Morocco, the Programme comprises 12 regional multi-centre hubs and 53 institutions, strategically located in rural areas, that provide practical training opportunities on farms or pedagogical polygons.

Since the 2000s, Tunisia has launched efforts to expand the capacity of the public TVET system, by creating new centres and restructuring several existing ones. In 2008, the Law on Vocational Education and Training was adopted, which led to an increase in the number of students enrolling. Drop-out rates remained high, however, reflecting the low quality of training provided. In 2013, a TVET reform strategy was launched, covering the period 2016-20. As the implementation period has formally expired, the reform process is now being assessed, taking into account the impacts of COVID-19 pandemic.

Source: UNESCO (forthcoming), *Supporting Education and Skills Development Systems for Informal Workers Recovery after the Pandemic. Report*; ETF (2021), *Morocco. Education, Training and Employment Developments 2021*, www.etf.europa.eu/sites/default/files/document/CFI_Morocco_2021.pdf; UNESCO (2020), *TVET Country Profile, Morocco*, https://unevoc.unesco.org/pub/tvet_country_profile_morocco_revised_2020.pdf; ETF (2021), *Tunisia. Education, Training and Employment Developments 2021*, www.etf.europa.eu/sites/default/files/document/CFI_Tunisia_2021.pdf; OECD (2015), *A Skills beyond School Review of Egypt*, OECD Reviews of Vocational Education and Training, OECD Publishing, <http://dx.doi.org/10.1787/9789264209626-en>; OECD (2015), *Investing in Youth: Tunisia: Strengthening the Employability of Youth during the Transition to a Green Economy*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264226470-en>.

To ensure the TVET systems can provide the agility needed to adjust to changing labour market demands, in addition to supporting them with sufficient resources, it is important to broaden the qualification profiles and integrate core technical work skills into the curricula. In addition to improving the employability of youth, such measures may also increase the potential for further upgrading initial qualifications (ILO, 2018^[17]) and help young workers to more effectively acquire skills on the job throughout their working lives (Angel-Urdinola and Tanabe, 2012^[18]). Introducing opportunities to facilitate easy transitions between academic and vocational tracks may help attract a larger pool of students and encourage interested students to pursue further studies (OECD, 2015^[14]).

To meet the growing demand for technical skills in new occupations, TVET systems should – as a primary mandate – offer competencies such as technical skills to use new machinery and technologies. Depending on the programme, they should build in understanding of environmental regulations, labour regulations, food quality, food safety and hygiene. In view of the export orientation of some industries, TVET can also include competences for internationalisation, such as an understanding of laws and regulations, trade

agreements, intellectual property, quality requirements and digital marketing. Such offerings will enhance the attractiveness of the sector for young people.

Vocational training programmes must also consider teaching socio-emotional and digital skills, which are increasingly required in many occupations generally and in agro-food sector specifically (as discussed below). Finally, TVET systems can also be a good place to provide vocational guidance and to enhance entrepreneurship skills, which entails training in business management, negotiation, leadership and team building (OECD, 2018^[19]).

While technical degrees in agro-industry do exist, employers often find their curricula too theoretical. It is, thus, important to engage employers in developing curricula of dual apprenticeship and paid apprenticeship schemes that offer real-world practical training, assess skills and pre-screen candidates for training. This can allow students to become equipped with the most relevant technical skills. Employers, in turn, later save time by hiring the most talented apprentices, and benefit from higher productivity and lower attrition of recruits. This also helps enterprises see their involvement into such training programmes as an investment, while alleviating the financial burden of students for training. Examples from other countries show that the most successful programmes are established under public-private partnerships (PPPs) between private companies and regional governments within the context of existing TVET institutions. This alleviates the burden for the employer in terms of training space and staff, while guaranteeing the quality of skills acquisition for students (Singh, 2020^[20]; Steel and Snodgrass, 2008^[21]).

The success of TVET systems, dual apprenticeship skills and paid apprenticeship programmes relies on several factors, including the acquisition of foundational skills provided by universal secondary schooling. An enabling environment, provided through labour and tax laws for “employed learning”, is also vital, particularly with incentives to engage both employers and workers. For this, it is important to involve employers and employer associations in developing such environments as well as establishing skill qualification frameworks, defining occupation standards, elaborating the definitions of occupations, and mapping the skill sets required in each occupation.

Financial incentives can also play a role to create an environment in which employers see financing youth skill development as an investment that offers a certain guaranteed return. Young students, in turn, should be incentivised to acquire skills, not least in the form of a guarantee of securing a formal job. Financial incentives can be provided both to employers to provide training and to workers to take it up. Such incentives may include wage and training subsidies, tax incentives, loans at preferential rates, grants, stipends, or targeted vouchers to reduce training costs such as training fees, transportation or accommodation.

Training programmes may be particularly effective if coupled with mechanisms to increase mobility of women in the MENA region. The extension of training to rural areas, where education levels are low, could also be especially beneficial. Currently, the region’s training programmes tend to serve higher-income and more educated individuals (Angel-Urdinola, Semlali and Brodmann, 2010^[22]).

It is also to recall that informal training, notably informal apprenticeships, constitute a major source of training for school dropouts and low skilled youth and should be recognized through official schemes. To improve the quality and relevance of informal training, governments should engage with the informal providers and help them find opportunities to develop their capacity (including pedagogical skills), support them financially to acquire modern equipment and promote community involvement to reduce the administrative and organisational burden of training (OECD, 2018^[23]).

Integrate teaching digital skills for agro-food professions into curricula at all levels and types of training

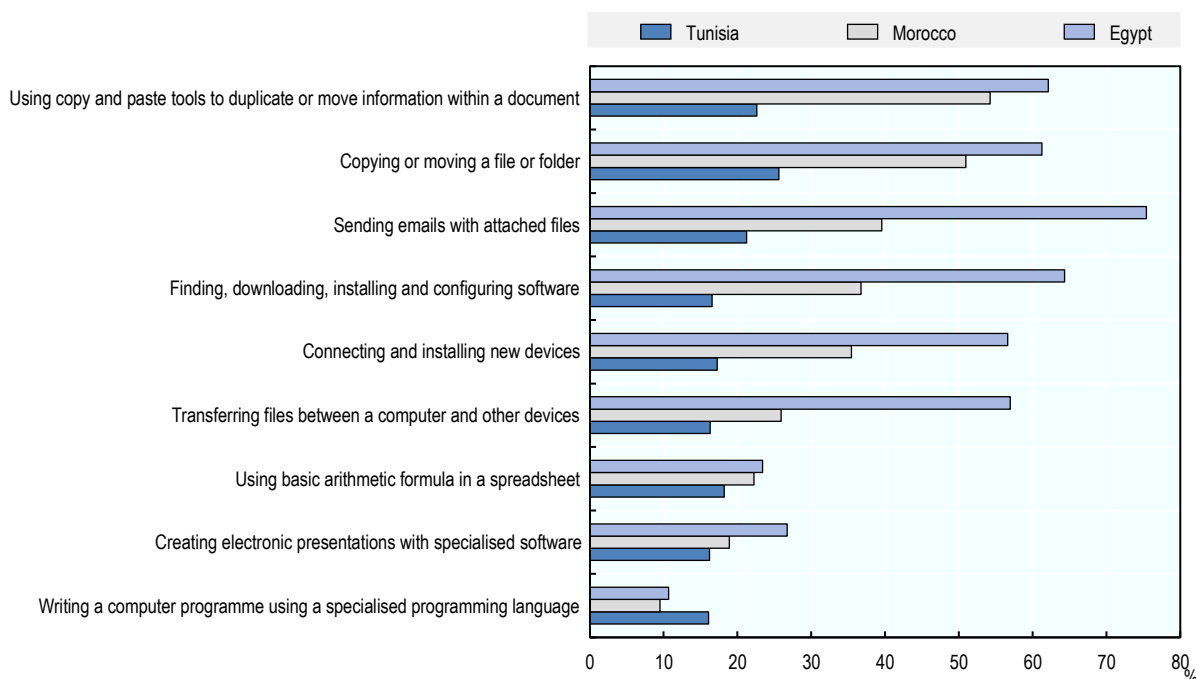
In the digital age, possessing digital skills is often an important requirement to secure a better job, implement innovative technologies, adapt new work organisations, and expand productive capacities and business.

The ILO global framework on core skills for life and work in the 21st century (ILO, 2021^[24]) includes basic digital skills, defined as the following abilities:

- **to use basic hardware:** the ability to operate a personal computer, tablet, mobile phone or other digital device using the hardware functionalities, such as a keyboard, mouse, navigation buttons and touchscreen technology, where appropriate.
- **to use basic software:** the ability to use and troubleshoot basic programmes and applications, and to be able to word process, manage files, and access and adjust privacy settings.
- **to operate safely in an online environment:** the ability to safely use basic online functions, applications, digital learning and communication platforms and media to explore, analyse and share information safely and ethically.

In Egypt, Morocco and Tunisia, high shares of individuals – among both adults and young people – do not have such skills or have only a limited set of such skills (Figure 4.2).

Figure 4.2. Proportion of young people with information and communications technology (ICT) skills by type of skill, in 2020



Note: Data in this figure for Tunisia are from 2019.

Source: ITU (2022), <https://www.itu.int/en/ITU-D/Statistics/Pages/SDGs-ITU-ICT-indicators.aspx>.

In the digital age, workers across the whole range of occupations in agro-food can benefit from having these skills (OECD, 2019^[25]; OECD, 2017^[26]). For example, farmers in rural areas can greatly benefit from being able to follow more carefully weather patterns and agricultural trends. In turn, they can identify market

price fluctuations for their products and avoid being taken advantage of by intermediaries and use e-finance services and e-commerce applications to expand market access and reduce food waste (World Economic Forum, 2019^[27]; World Economic Forum, 2019^[27]).

As digital technologies penetrate every sphere of activity, many sectors and occupations require that workers possess specialised digital skills. In agriculture production, for example, workers are increasingly benefitting from digital technologies such as remote sensing; use of digital soil maps, satellite imagery, geographic information systems (GIS) and global positioning systems; and operation of pesticide-spraying drones. These technologies allow them to be better informed and advised about soil conditions, collect data about plant health, yields and soil composition, use seeds and fertilisers optimally, and take prompt remedial action if necessary (Kremer and Fossoun Hougbo, 2020^[28]).

Technicians in food manufacturing and processing can benefit from the ability to use smart packaging (e.g. packaging material containing an intelligent component to detect changes in freshness, keep live records and ensure traceability). Workers in logistics, including transportation, warehousing and distribution, will increasingly use ubiquitous networked sensors (the Internet of Things or “IoT”) to remotely connect, track and manage products, systems and grids. They will also apply digital logistics for route optimisation and use resource aggregation platforms and logistics portals to connect trade and logistics partners. In time, they may also be expected to direct autonomous transport and fully automated warehouses. Supply chains will be increasingly managed with the involvement of blockchain and distributed ledger technology, based on cryptographic systems to manage, verify and publicly record transaction data (ILO, 2021^[29]).

Currently, the majority of workers who do not need any digital skills to perform their jobs are found in the agricultural production sector, followed by food and catering sector. Most of the latter jobs are performed by women. It is also in these sectors that workers who do use digital technologies at work report the biggest lack of basic digital skills, which often precludes them from switching to better-paid jobs or from taking advantage of digital technologies (ILO, 2021^[29]).

Basic and specialised digital skills can be delivered by various means. While basic digital skills can be acquired through secondary education, the best places for acquiring specialised digital skills are TVET and university. This is why it is vital to integrate digital skills acquisition into these programmes and regularly update them to ensure they remain relevant for the market. Incorporating digital skills training into TVET curricula can also make these types of training – and agro-food occupations in general – more attractive for young people. Indeed, young people are those who are more eager to use digital skills across the full range of agro-food occupations, all the way to consumption through e-commerce, on-site sales and direct mail/Internet orders, which experienced a real boom throughout the COVID-19 crisis.

The advent of digital technologies has also created many opportunities for independent learning – i.e. learning on one’s own. This refers to online delivery of knowledge through traditional schools as well as e-learning and open educational resources and open learning through massive open online courses (MOOCs) (ILO, 2021^[29]). By 2016, more than 100 MOOC specialised platform providers existed in the world, often offering courses in co-operation with educational institutions (Music and Vincent-Lancrin, 2016^[30]).

The emergence of MOOCs has made learning easier for many workers, including in the agro-food sector. In addition, social media channels, such as YouTube, Instagram, Facebook or Telegram (among others) and “how to” videos have allowed many workers to learn about new tools and work techniques, equipping them with skills and knowledge on demand. Even informal workers working in agriculture and living in rural areas are increasingly using these tools, for example, to get advice on new and more resistant seeds or to learn operate and repair drones used in agriculture (ILO, 2021^[29]).

Young people also use extensively Internet resources to learn to create their own apps and platforms for promoting their business and generate news forms of doing business. The COVID-19 crisis spurred both

demand for and supply of such resources, with content often provided by informal workers themselves as a new means of gaining their livelihood. The true role of these new tools of knowledge for informal workers is yet to be assessed in the coming years. What is clear, however, is that they will not be able to fully replace traditional learning institutions and education systems.

Attract students to tertiary education relevant to agro-food sector

Some professions in the agro-food sector will require skills that necessitate solid, specialised training at tertiary level. In turn, the tertiary education system also contributes to developing scientific and technological research and disseminating knowledge.

Evidence from OECD countries suggests that – relative to other sectors – enrolment in tertiary education in specialisations relevant to the agro-food sector, and especially for agricultural production, remain low (Ryan, 2023^[31]). In developing countries, the situation is even worse, especially when considering the weight that agriculture has in the national economies (AfDB et al., 2012^[32]). This reflects both the low attractiveness of the sector and the lack of appropriate programmes.

The situation is similar across the MENA region. In Morocco, for example, only three higher-education establishments currently specialise in agriculture. Recognising the need for change, within the framework of the Morocco Green Plan in 2008, the Department of Agriculture launched the National Strategy for Training and Agricultural Research, which has given new impetus to the agricultural higher education system. A main objective the Strategy is to create the Polytechnic Pole of Agricultural Higher Education, bringing together the three existing establishments and encouraging the pooling of skills and resources for better synergy. The Strategy also sets a goal of training up to 10 000 graduates by 2030.

More generally, creating and popularising specialised programmes for the agro-food sector professions are important avenues to attract students to relevant tertiary education and equipping future young workers with required skills.

Anticipate skill change and raise awareness about it

One problem facing the agro-food sector is its low attractiveness for young workers. Often, this perception is justified. The ongoing transformation of the sector, however, will offer new jobs with better working conditions and pay. Indeed, demand for skills is changing very rapidly in line with a wide array of factors, including structural transformation; technological changes including digital transformation; the need to adapt to climate change; and sophistication, diversification and also disruption of global and regional value chains. Together, these are resulting in change in consumer demand and in firm organisation and practices. While these factors will cause some current jobs disappear, they will also stimulate the emergence of new jobs and tasks, or trigger the modification of existing work tasks within traditional jobs (OECD, 2016^[33]; OECD, 2017^[34]). Another problem, however, is that many future young workers are not aware of these changes and the possibilities that they bring. As such, young workers cannot prepare for the jobs becoming available by choose specialisations that will allow them to learn new required skills that will be in demand or to apply for such new jobs.

In this regard, the role of government is twofold. On one hand, it needs to anticipate the skill demand and skill requirements (skill change); on the other, it also needs to provide better information and career guidance to future workers.

To ensure efficient skill anticipation, governments should be joining forces with social partners. For example, across most OECD countries, employers, employer organisations and trade unions are involved in identifying skills needed for the labour markets (OECD, 2019^[35]; OECD, 2019^[36]). Social dialogue at the enterprise, sector or national level can also be an effective tool to determine which skills are missing and the best ways to address this issue. For example, specific mechanisms to improve industry engagement in curriculum development, raining provision and financial contribution could be set up. Indeed, the private

sector can identify up-to-date skills and knowledge that students should acquire to work in various occupations and make sure there are no training gaps in the curricula. It can also be involved in delivering training through internships and apprenticeships. Governments should support these private sector efforts through incentive mechanisms (OECD, 2018_[23]).

Provision of timely, detailed and transparent information on emerging skill and training needs is particularly important for updating education. Precisely because this is a constantly evolving scene, it also demands a more integrated environment linking research, government, employers, and education and training providers in ongoing dialogue. In turn, career and vocational guidance and orientation should be systematically encouraged at all levels of education as well as through community-based approaches. A sound governance and informed policy making requires collecting a variety of information on people's trajectory in the education system and the labour market. Governments should follow how many students engage in various fields of study at different levels, follow the quality of educational resources, including pedagogical materials and teachers, and eventually track how students perform in the labour market. In parallel, information about the skills needed by the private sector should be collected. This can provide an accurate picture of the quantity and type of skills available and needed, and inform on the types and sources of skills mismatch in the country (OECD, 2018_[23]).

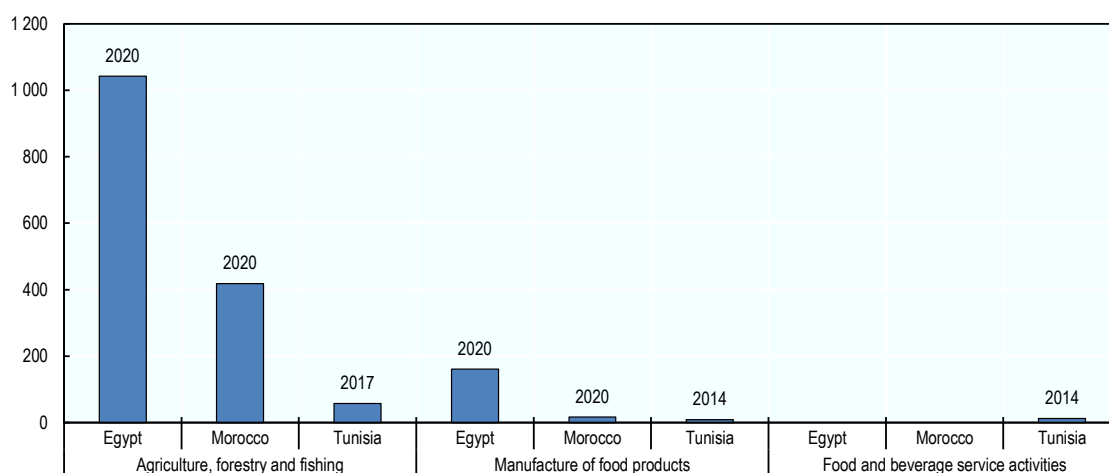
Policies for young people already working in the agro-food sector

Within the agro-food value chain, around 2020, domestic agriculture production (the first node) absorbed the greatest number of young workers in Egypt, Morocco and Tunisia (Figure 4.3). Often, this reflects the fact that agriculture is the easiest entry point into the labour market, although this often also reflects a lack of choice and other opportunities, especially for low-skilled young workers in rural areas. Many start off as contributing family members in subsistence agriculture owned by their relatives. While this shows that agriculture production can benefit from this abundant young workforce and provide a minimum employment opportunity, as shown in Chapter 2, agriculture production is plagued by informality, poor working conditions, low pay and limited prospects for skill development. In many cases, it traps young workers rather than providing them with true “take-off” opportunities in life. To benefit from the abundant youth presence in this sector, it needs to offer better opportunity to young people. As such, specific policies are needed to improve their skills, productivity and working conditions.

In contrast, the node of manufacturing of food products, food and beverage service activities, despite being one of the greatest employers, remains largely unexplored by young people (Figure 4.3). A variety of reasons have been identified, including poor young people orientation towards these sectors and a lack of connections, skills and experience on the part of young people. In reality, food manufacturing enterprises (as compared to agriculture production) have greater chances of offering wage (formal) employment, greater income stability and better skill development prospects, as compared to other nodes of the value chain. The extent to which these opportunities are realised also depends on the enabling environment in which these enterprises operate.

Clear scope exists to channel more young people towards this sector, including by providing incentives to these enterprises. This is especially relevant given that, within the timeframe of 2022-30, an estimated 2 346 000 individuals in Egypt, 664 000 in Morocco, and 200 000 in Tunisia are expected to reach the age of 15 annually, thus becoming potential new entrants into the labour market on an annual basis (UN DESA, 2022_[37]). It is mainly young people, at the beginning of their careers, who select career tracks outside the farming sector and who migrate to urban areas to explore and take up new job opportunities. One way to ensure such channelling is to provide incentives to enterprises in the agro-food sector to hire young workers and – with the view of retaining them – equip them with the right skills.

Figure 4.3. Young people (15-24 years old) employed in the agro-food sector, in thousands, latest available data



Note: In this graph, the agro-food sector includes tobacco production. Data for “Food and beverage service activities” sector for Egypt and Morocco is missing.

Source: ILO (2022), ILOSTAT, <https://ilostat.ilo.org/data/>; HCP (2021), *Annuaire Statistique de Maroc (2021)*, www.hcp.ma/downloads/Annuaire-Statistique-du-Maroc-format-Excel_t22392.html.

Equip young workers with the right technical skills: The role of enterprises

With many new types of productive activities and jobs developing in the agro-food sector, especially in the food processing and manufacturing segment of the value chains, enterprises are a natural place to equip workers with the right technical skills. This is particularly true in sectors requiring relatively new types of skills that may be enterprise-specific. In a context of abundant labour with poor technical skills, as in MENA, models of investing into in-house skill development to build up and retain a skilled workforce can be particularly effective as compared to investing into human resource strategies to search for workers with the right skills on the labour market – and not find them.

Indeed, across OECD countries, employers are the main providers of reskilling and upskilling opportunities for young workers and adults (OECD, 2021^[39]). In some countries, subsidies and other financial incentives encourage employers to facilitate training provision and provide access to training. In many developing countries, including MENA, such incentives may be absent or the mechanisms for their use underdeveloped such that employers (especially in the informal sector) may have fewer resources to provide training.

Globally, the availability and type of training greatly depends on the sector of activity, occupations and size of the enterprise. Evidence from African countries shows that employers in the services sector are more likely than those in agricultural enterprises to provide training to their employees. This was especially true during the COVID-19 pandemic (ILO, 2021^[39]). Additional evidence from more than 70 countries suggests that enterprises that were formal from the moment of their creation (as compared to those that were initially informal and became formalised) have a significantly higher probability to provide training to their employees and also to train more staff (OECD, 2024 (forthcoming)^[12]). The agro-food sector, especially agriculture production, is dominated by informal enterprises that tend to provide fewer training opportunities to their workers.

The COVID-19 pandemic has affected even these rare training opportunities. A global survey of enterprises in mid-2021 found that four in five enterprises had completely or partially suspended their operations in the midst of lockdowns. As a result, globally, training was interrupted for 90% of employees, 86% of apprentices and 83% of interns and trainees, with micro, small and medium enterprises (MSMEs),

which are most often informal, the most affected (ILO, 2021^[40]). Additionally, nearly a half of enterprises and organisations stopped paying a stipend or wages to apprentices and interns/trainees. Remote rural areas were particularly affected in that people typically have low levels of digital literacy (particularly among low-skilled informal workers) while employers lack of adapted training programmes and resources. This made it particularly difficult to deliver practical training online (OECD, 2024 (forthcoming)^[12]).

As a result of these forces, skill provision at the enterprise level in MENA region generally – and in the agro-food sector specifically – remains largely unexplored and inadequate. Scope clearly exists for enhanced employer participation in skill provision and for public authorities to creating the right incentives for employers to engage. Creating an environment in which employers see skill financing as an investment, with a certain guarantee of return, is one way to address this challenge. Young workers, in turn, should be offered incentives to acquire skills, not least in form of a guarantee of securing a formal job with decent working conditions and career prospects. This can be achieved through financial incentives to employers to provide training and to workers to take it up. Such incentives may include wage and training subsidies, tax incentives, loans at preferential rates, and individualised learning account schemes that are transferable across jobs and open to all workers, including own-account. Targeted programmes and incentives for employers to train young people can be set up, as well as programmes designed for young workers, who may not be eligible for standard support measures (OECD, 2024 (forthcoming)^[12]).

Stimulating the development of modern, high-quality dual apprenticeship schemes is another way of addressing the issue (as discussed above).

Provide skill-upgrading possibilities through public programmes for young workers

In the context of the under-supply of skills training by enterprises, scope and high need exists for public provision of skill-upgrading possibilities. Such possibilities, however, must clearly recognise the type of void they are filling, namely the provision of skills that cannot be delivered by enterprises or through the school system.

The agro-food sector, and especially agriculture production, heavily relies on own-account workers, the vast majority of whom are informal. Thus, as a first priority, public programmes for agriculture learning and skill-upgrading should be inclusive of these workers. Too often, public programmes target only formal workers, whether explicitly or implicitly (OECD, 2024 (forthcoming)^[12]). Second, public programmes should also offer solutions that are tailored to the needs of these workers, recognising their prior low quality and quantity of formal training and the opportunity costs of training. Targeted, specialised programmes, especially when coupled with financial incentives, can help fill the training gap while also boosting the attractiveness of the sector (Ryan, 2023^[31]), particularly for young workers. Third, these programmes should be made available where young workers of the agro-food sector are located: i.e. predominantly in rural areas and small towns. This would be important to allow young workers to economise on transportation and lodging and to boost participation of young women, for whom secure travel remains challenging (OECD, 2024 (forthcoming)^[12]).

Support other opportunities for skill upgrading and reskilling

In the agro-food sector specifically, many workers are own-account, which means they have to provide for their own training. In reality, such training is rare, not least because most workers – especially informal, low-skilled workers with low pay – cannot afford to forego even one day's earnings (OECD, 2019^[41]). As a result, they cannot engage in trainings that might be organised far from their workplace.

Own-account workers do, however, engage in informal learning and training courses, which in many countries may be offered by farm extension services, industry, agricultural advisory services, and/or farmers' organisations and co-operatives (Ryan, 2023^[31]). Governments should encourage development of such learning possibilities and ensure information about such possibilities is distributed more broadly.

Where financial issues preclude young workers from participating in such trainings, innovative mechanisms of support, such as *chèques de formation* (training cheques) in Tunisia, can be useful for supporting learners and expanding provision of training possibilities, including through the private sector (OECD, 2015^[14]).

Adaptation of the agro-industry and workers, including to changes in technology, make it essential that continuing professional training, reskilling and upskilling becomes the norm, with industry, government and education institutions working together to develop and provide it. In this context, education providers should be encouraged to be nimbler and introduce collaborative micro-credentials, using blended learning where possible to provide learner incentives and reinforce links with industry.

Recognise skills and prior learning

As Chapter 2 shows, a sizeable share of young people still exists in Egypt, Morocco and Tunisia who have not finished school or have not benefited from a high quality of schooling. This does not necessarily mean they lack work-related skills. Indeed, many have been involved into family businesses and performed many tasks (often unpaid) throughout their childhood, adolescence and youth. Their problem is not the absence of skills, but the absence of the right credentials to prove their skills and aptitudes, which may impede them from finding jobs elsewhere and building upon these skills. In this context, skill recognition policies and programmes can fill the gap.

Throughout the MENA region, skill recognition programmes remain undeveloped. In Morocco, for example, the legal texts enacting the development of such programmes have been in the production stage since 2007 but had not yet been adopted at the time of writing of this report. In their current draft form, they concern only a limited number of sectors (Chatagnon et al., 2023^[42]).

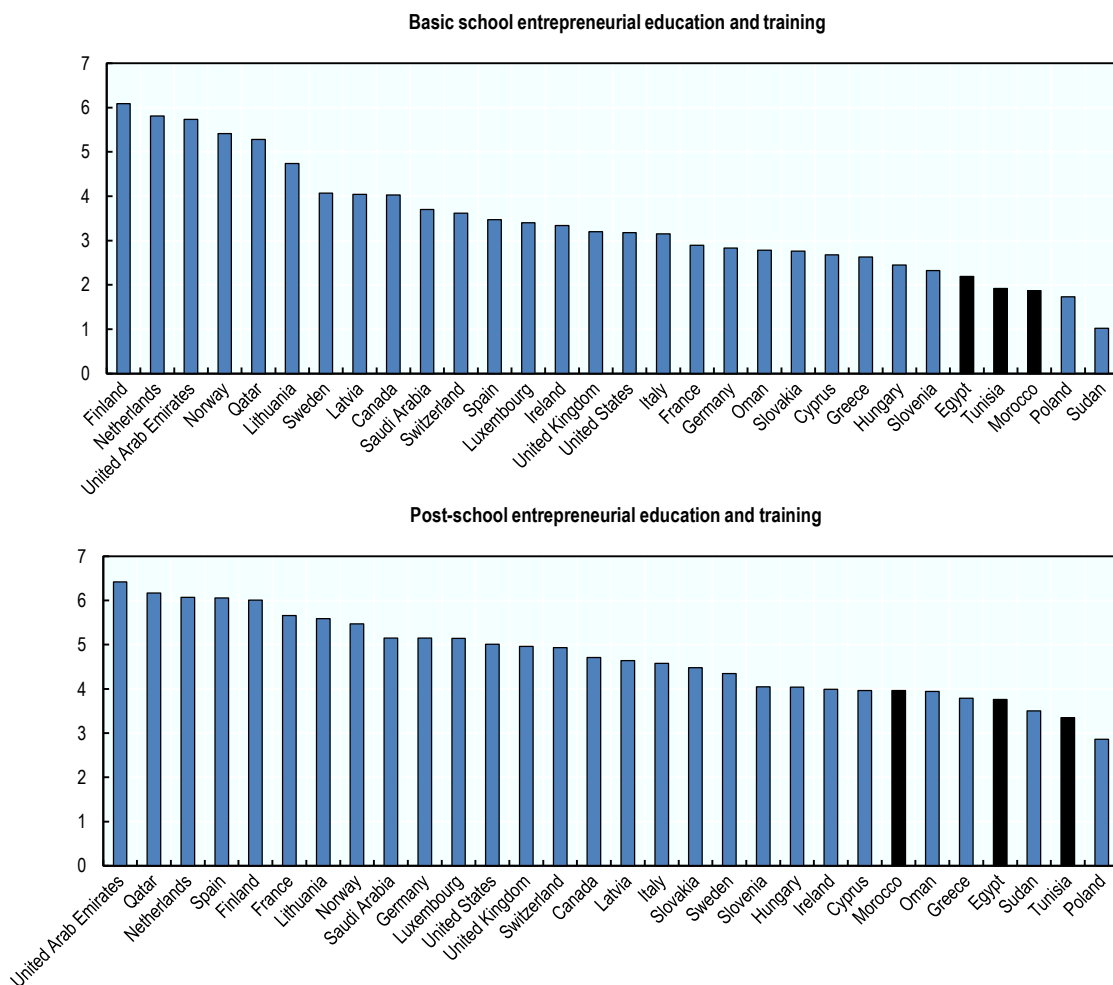
Creating an appropriate legal framework, enacting skill recognition programmes, and diffusing the information about such programmes to workers and employers are among the promising tools to more appropriately value any competencies that young people acquire on the job and, hence improve their employability, potential incomes, and possibilities to further upgrade their skills through programmes that require a certain level of qualifications (Chatagnon et al., 2023^[42]).

Support youth entrepreneurs to ensure that they succeed

Youth entrepreneurship is often considered a viable solution for youth employability. This is because younger people generally have more energy, have fewer concessions to make in terms of established careers and high salaries, and might be closer to new or emerging markets and business-accelerating technologies. They might also be more prepared to take risks, since they may have less to lose and, if the business fails, they can still have a long and successful career ahead of them. At the same time, young people are likely to have less knowledge and experience and less access to resources, including established networks. Experienced workers are likely to have greater awareness of markets and opportunities, better access to capital and other resources, and the skill and experience needed to run a business. They may, however, feel constrained because they also have mortgages, more family responsibilities and a career to give up, all of which may result in greater aversion to risk.

In many countries, creation and management of SMEs is incorporated within the education and training system at different levels, with the aim of helping young people to develop formal activities, create new jobs and have new experiences on the labour market. Egypt, Morocco and Tunisia are behind most OECD and MENA countries in providing entrepreneurial education at school and in post-school stages (Figure 4.4).

Figure 4.4. Extent to which training in creating or managing SMEs is incorporated within the education and training system, by level of education



Note: In this figure, data from Tunisia and United Arab Emirates are from 2015, while data for the rest of countries are from 2021. The index is calculated using Global Entrepreneurship Monitor's survey data, where higher values indicate a higher extent to which the training is integrated within the education and training system.

Source: Global Entrepreneurship Monitor (2022), www.gemconsortium.org/data/key-nes.

As noted elsewhere, the agro-food sector is highly specific. Only very few young people succeed as entrepreneurs or “agripreneurs” who are able to employ other people (OECD, 2017^[43]). In developing countries, the majority would eventually be employed as own-account workers, making subsistence living.

To be effective, programmes aiming to enhance youth entrepreneurship in the agro-food sector, and especially in agriculture production, should show opportunities where youth entrepreneurship can be particularly successful. This includes, for example, entrepreneurship training on green job skills, including green skills in business start-up training and incubating companies with potential to address environmental issues (OECD, 2015^[14]).

To be successful, youth entrepreneurship programmes should also be coupled with a range of other supporting policies. At present, access to land is difficult for young people, especially because rural areas are underserved by formal financial institutions. Yet such access is a critical decision factor whether young people decide to engage in farm or non-farm activities or to migrate (OECD, 2018^[19]). Policies to improve access to land and to financial services could encourage agripreneurship or other activities in rural areas.

Activities aimed at helping young people engage in agriculture will also need to support their incomes, seed capital and/or materials to get started. Another challenge is that current financial services are often not adapted to the specific needs and constraints of young people, who typically lack collateral, financial resources and the right networks (Sykes et al., 2016^[44]). Young people in MENA have, by far, the lowest rates of financial inclusion in the world. A World Bank study found low rates of young people having an account at a formal financial institution in Egypt (10%), Morocco (36%) and Tunisia (24%) compared with 84% in Europe and Central Asia and 66% among young people worldwide in 2021 (World Bank, 2021^[45]).

Leverage the potential of agricultural advisory services

Agricultural advisory services (AAS), often referred to as extension and advisory services (EAS), can be an important source of support for young farmers and food producers. Throughout OECD countries, these entities serve several roles including (OECD, 2015^[46]; OECD, 2012^[47]):

- Provide farmers and rural communities with valuable information on various aspects of farming, such as pest management, soil conservation, environmental land management, water management, climate-smart agriculture, weather forecasting, post-harvest practices, available financing options, or market opportunities and solutions.
- Provide technical advice and support to adopt modern technologies and sustainable production methods and agricultural practices that can improve productivity.
- Provide training on the use of modern technologies, including precision farming, drip irrigation, greenhouse farming, agro-environmental management, etc.
- Facilitate networking and linkages among young small-hold farmers, agrobusiness and other stakeholders in the sector, and help promote value chain development.
- Provide a platform for peer-group and co-operative initiatives, which helps young farmers to meet and exchange ideas and learn from successful agrobusiness.

Many of these functions are vital to helping overcome many barriers that youth, in particular, face when entering the agro-food sector.

AAS / EAS are typically funded by the public sector and employ a significant number of extension workers, with investment levels comparable to those dedicated to agricultural research (Anderson, 2008^[48]).

In developing countries, the AAS / EAS have been widely promoted for at least three last decades (Davis and Steven, 2018^[49]). Results, however, have been sub-optimal, such that these services are often perceived as ineffective (Maake and Antwi, 2022^[50]). In many cases, this low quality of service reflects various constraints including a centralised top-down approach, insufficient financial and human resources, limited capacity of trainers, and outdated equipment.

Nevertheless, AAS / EAS are considered as catalysts for innovation and adoption of sustainable agricultural practices. Given their potential role for improving employment outcomes, it would be more valuable to re-invent these services rather than shut them down (ILO, 2019^[51]). This can be achieved, for example, by shifting from a single, main public extension system towards pluralistic systems, in which different actors – e.g. the private sector, non-governmental organisations (NGOs) and farmer organisations – provide diverse services. Care should be exercised to ensure good co-ordination among these actors. In Egypt, for example, rural advisory services involve multiple actors with the public sector taking a lead role while NGOs, international projects, private companies and co-operatives also contribute. At present, however, co-ordination and collaboration among service providers are weak, hindering effective service provision, especially for small-scale farmers. Lack of a clear mandate and objectives often further impedes resource mobilisation and service provision (FAO, 2022^[52]).

Because participation in AAS / EAS measures is voluntary, these services should also be made more appealing, relevant and targeted to young farmers. Improving the quality of services and expertise provided

is critically linked to the need to first “train the trainers and advisors” and ensure they have access to up-to-date sources of knowledge (OECD, 2015^[46]).

Empower women in the agro-food sector

In many countries of the MENA region, culture and prevailing gender and social norms play a major role in determining traditional gender roles and responsibilities. They determine what women can and cannot do, excluding many women from the labour market and, for those who do work, creating strong segregation across sectors and occupations (OECD, 2019^[53]). As shown in Chapter 2, female potential throughout the region remains largely unexplored. Moreover, young women face a double disadvantage of integrating into the labour market, related both to gender and to their age.

The occupational segregation starts very early on: even at school, by determining which specialisations girls can or cannot choose. Very often, STEM disciplines are considered not to be suited for girls. This segregation continues throughout youthhood and impedes young women to build on other skills. For example, in Egypt, 20% of women believe that the Internet is not appropriate for them or that their families would disapprove its use; in turn, 40% of women identify lack of familiarity with technology as a reason for not using the Internet (Dalberg Global Development Advisors and Intel Corporation, 2019^[54]). In other words, social gender norms restrict women’s access to information and communication technology, even when they have the necessary literacy skills.

In agriculture production, women are quite active in the MENA region – but often relegated to subordinate positions due to rigid gender-based divisions of labour in agricultural tasks, household care and domestic responsibilities. Despite progress in recent decades, women are not viewed as independent; their roles are often relegated to being helpers and contributing family members. Culture and prevailing gender and social norms also influence access to and control over agricultural and water resources (FAO, 2023^[55]). Land ownership remains a very delicate issue. In Egypt, for example, even if legal frameworks guarantee women’s land rights on equal terms with those of men, they are largely thwarted by prejudices against women inheriting land. Many women lack general awareness of their rights and of land rights enforcement mechanisms that guarantee women’s recourse to adequate justice structures (such as courts) (OECD, 2019^[53]). Another example in agriculture is that women in Egypt are prohibited from working with fertilisers and insecticides (IBRD and World Bank, 2019^[56]).

As a result, women have lower pay and income and lower agricultural productivity than men in the sector (Doss, 2010^[57]). This leads to lower financial savings, poorer access to credit and technology, and constraints to participation in decision-making inside and outside the household. Women farmers, especially young, are often excluded from agricultural support services including access to finance; access to and decisions about irrigation; agricultural training, innovative practices and technologies; market information; and social protection. They may even be excluded from programmes designed to meet the specific needs of women in the agricultural sector (FAO, 2021^[58]; AbdelMonem et al., 2022^[59]). Scope exists to increase women’s meaningful participation in agriculture, irrigation and domestic water; however, effective policy solutions are needed that include strategies to empower women on economic, social, legal and policy levels.

Overcoming these challenges requires addressing cultural norms, particularly promoting women’s education and empowerment. It also means boosting men’s education with a view of changing attitudes towards women and ensuring gender equality in agriculture and water management institutions (FAO, 2023^[55]).

Social and economic empowerment of women is essential for bringing about meaningful progress (FAO, 2023^[55]). Such empowerment should, first and foremost, take the form of recognising the role of women in agriculture. For example, in Morocco, the Green Generation 2020-2030 strategy (launched in 2020) creates a new worker status, “*l’exploitant agricole*” (agriculture exploiter), to recognise these workers and ensure they (among others) are covered by social protection and gain access to other rights. The Strategy

framework also envisages a series of actions to mobilise professionals to recognise and declare helping family members as employees, with the same objective of granting them rights and protections (Royaume du Maroc, 2023^[60]). Given the share of women in agriculture production – especially as contributing family members – it is vital to ensure these provisions indeed benefit women, including young, proportionally. Achieving transformative change also requires granting women landownership rights and facilitating their access to financial services, resources and networking opportunities.

Another critical way to strength the potential of women is to recognise their traditional knowledge. Across MENA countries, women are widely considered as the gatekeepers of traditional knowledge linked to natural resource management and leader in the development of natural products. In Morocco, initiatives such as income-generating activities through co-operatives aim to empower rural women economically and lift them out of poverty by incorporating their traditional knowledge into the development of natural products (Montanari and Bergh, 2019^[61]). Various legal practices and procedures can also be revised to acknowledge and protect this knowledge, ensuring that women receive proper credit and compensation for their contributions.

Complementary and broader solutions, such as transport security for women and having access to good quality childcare, will also help ensure easier and more meaningful participation of women in paid activities.

Segments and occupations within agro-food value chains that feature a sizeable share of women, including young women, include food processing, food marketing, retail, restaurant and catering. Young women in these segments and occupations tend to have a higher level of education as compared to other segments of the agro-food value chains (OECD, 2021^[3]). Developing these segments can offer promising paths for greater inclusion of women into productive activities, though attention is needed to ensure these activities do not enroot prejudice and gender stereotypes about what women can do.

Broader policies to support businesses, sustainable job creation and better working conditions across the entire agro-food value chain

Several factors make jobs in the agro-food sector unattractive, especially agriculture production and food industry. Such jobs typically take place within small farms or enterprises and rely on hard labour in poor working conditions while featuring high degrees of informality, precarity and low pay. They also offer little stability and few prospects (OECD, 2021^[3]). Low pay and poor working conditions make it difficult to farmers to sustain their living. Small farmers and entrepreneurs often feel isolated. They also lack resources, information and opportunities to upgrade their skills, invest into better technologies or connect to the rest of the value chain. In agriculture production in particular, many young people are involved as contributing family members or own-account workers, making them particularly vulnerable. In this regard, several proven policies can be of merit.

Improve the enabling business environment in the agro-food sector

Creating the right enabling environment for business overall is a necessary foundation for creating economic opportunities, including for young people. The World Bank Enabling the Business of Agriculture indicators help to assess whether governments make it easier or harder for farmers to operate their businesses (Table 4.2). They are meant to measure laws, regulations and processes, as well as identify regulatory obstacles to market integration and entrepreneurship in agriculture. As the figures suggest, Egypt, Morocco and Tunisia still have a lot of room to improve the enabling environment for agriculture businesses, even though they have made considerable progress in some areas. For example, Morocco is among the top performers on the protecting plant health indicator (IBRD and World Bank, 2019^[56]).

Table 4.2. Indicators of enabling the business of agriculture, scored on 0-100 scale

Country	Supplying seed	Registering fertiliser	Securing water	Registering machinery	Sustaining livestock	Protecting plant health	Trading food	Accessing finance	Overall score
Egypt	57.09	59.76	0.00	97.62	25.00	20.00	66.98	50.00	47.06
Morocco	62.42	0.00	80.00	97.94	55.00	100.00	56.79	60.00	64.02
Tunisia	39.57	5.56	40.00	74.02	28.33	40.00	78.68	10.00	39.52

Note: Enabling the Business of Agriculture uses indicator scores to assess and monitor countries' performance in regulatory practices for farmers. Scores are derived through normalisation and rescaling of components, with outliers handled for efficiency. Indicator scores range from 0 to 100, reflecting performance levels. The calculation involves averaging equally weighted component scores. A higher score indicates better performance. Changes in indicator scores over time indicate improvements.

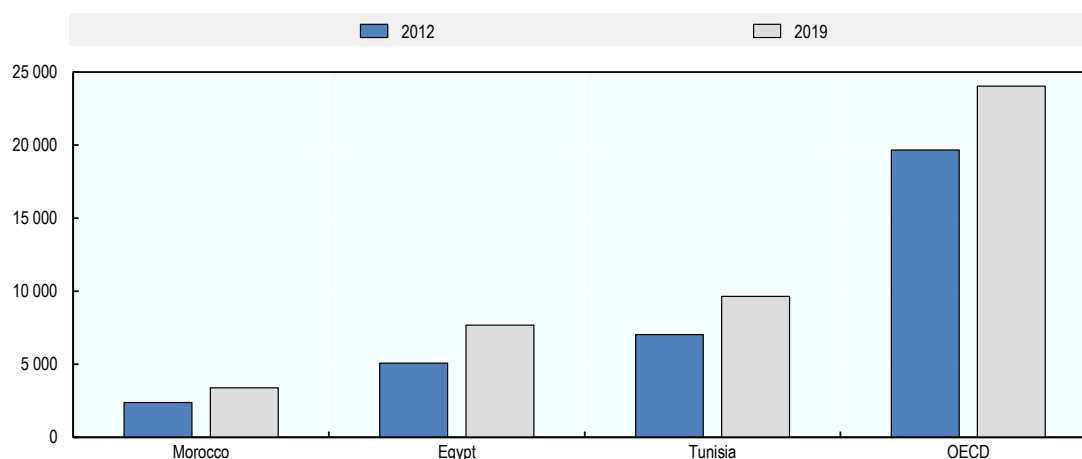
Source: World Bank (2022), *Enabling the Business of Agriculture*, <https://eba.worldbank.org/en/eba>.

Help small-holder businesses enhance their productivity and integrating value chains

Most of the businesses in the agro-food value chain are small-holder businesses, including own-account workers, family businesses relying on contributing family members, and SMEs. Because a significant share of workforce currently relies on these small business models, questions arise how to support them with the view of raising their productivity, and eventually incomes. Indeed, the productivity of farm labour, despite on the rise rising in Egypt, Morocco and Tunisia in the past years, still remains relatively low compared to OECD countries (Figure 4.5). Increasing productivity can boost profits and wages, while also ensuring that small stakeholders are included in sector development. Helping existing small farms to scale up and organise also has potential to expand non-farm opportunities and spur structural transformation for further development (Jayne et al., 2019^[62]; Wineman et al., 2020^[63]; World Bank, 2018^[64]). In contrast, replacing these businesses with large-scale farms that rely on wage employment with the hope of raising productivity is not always an ideal option, as it would necessarily drive many other workers, especially women and lowest-skilled, out of the labour market, and also may aggravate the environmental problems related to intensive land and water use, erosion, or deforestation which would eventually constrain productivity growth (OECD, 2021^[65]).

Figure 4.5. Labour productivity in selected MENA countries

Agriculture, forestry and fishing, value added per worker, in constant 2015 USD



Source: World Bank (2023), *World Development Indicators*, <https://databank.worldbank.org/source/world-development-indicators#>.

Government support can come in many forms. One form is providing more secure rights for land ownership and acquisition, so that farmers can invest into land without fear to be unable to benefit from their investment. Another form is support of investments into better machinery, tools, and methods, for example through tax breaks, targeted loans and grants, and easier access to credit and soft loans to young entrepreneurs and small-scale businesses in the sector. Around 2020, only 7.4% of all bank loans in Egypt went to small and very small enterprises (Central Bank of Egypt, 2020^[66]); this figure stood at 39% in Morocco (Bank Al-Maghrib, 2020^[67]). The agricultural production sector receives only 1.4% of lending and discount in Egypt (Central Bank of Egypt, 2020^[66]), 3.8% in Morocco and around 4% in Tunisia. Easier and greater access to credit, soft loans, and insurance schemes is also needed, especially when credit demands concern initial investments in new machinery, equipment and technologies or meeting environmental and quality requirements.

Access to finance is a binding constraint on doing business in MENA in general (Farazi, 2014^[68]). Improving such access, including through stronger legal frameworks and improved credit protection regimes, can promote formal private sector activity by increasing the transparency of firms to investors and facilitating investment (Massenot and Straub, 2011^[69]). In 2019, Egypt implemented policies in this area, such as new insolvency resolution laws. The adoption of financial technologies (fintech), such as innovations that automate financial transactions, can also facilitate access to financial services by informal, unbanked individuals and SMEs (Inutu Lukonga, 2018^[70]).

Support to small-holder businesses can also come from co-operatives (Box 4.2), regional and local governments and communities. Examples exist of how these entities can support business development include providing services such as marketing, project management and certification; offering assistance with loan and grant applications; providing IT support; and sharing information about potential markets (see examples in (OECD, 2021^[3])).

Box 4.2. Co-operatives in the artisanal fishing sector in Morocco

The co-operative movement in the artisanal fishing sector plays a significant role in organising the work of fishing communities in Morocco, allowing fishermen grouped in co-operatives to generate higher profits and increase their income. This directly improves the socio-economic conditions of fishermen. Forming co-operatives helps fishermen to unite around a development project, promoting a co-operative spirit, contributing to the preservation of resources through responsible and sustainable fishing, and diversifying their activities through the valorisation and commercialisation of fishery products. In turn, the co-operative becomes a privileged and sole interlocutor with the administration, facilitating communication and the implementation of training and support programmes tailored to the needs of the members.

Statistics confirm the presence and impact of fishing co-operatives in Morocco: 111 co-operatives have a total of 4 864 members engaged in various fishing activities, including artisanal fishing, pelagic and cephalopod fishing, algae collection, shellfish collection, coastal fishing, and commercialisation and export. To support and accompany these fishing co-operatives, the Moroccan government implemented a programme (“Programme d’appui et d’accompagnement des coopératives de pêche”) that includes the generalisation of social and medical coverage. It also offers capacity building for co-operatives through training and mentoring of board members, vocational training, outreach, and functional literacy programmes that ultimately benefit 20 000 fishermen, as well as women and children of the fishermen. The programme also organises workshops and inter-co-operative exchange visits. Additional efforts focus on improving working conditions by developing reception structures and upgrading and equipping infrastructure dedicated to artisanal fishing in ports and fishing sites. In turn, the initiative promotes income-generating activities by providing mechanical workshops, ice factories, refrigerated trucks and outboard motors, and by establishing mussel farming and valorisation units. Ongoing projects involve

constructing and equipping shellfish packaging units, algae drying facilities and fish sales stands, as well as providing tricycles for marketing.

To further strengthen the co-operative movement in the maritime fishing sector, individual co-operatives are being organised into regional unions, including the Mediterranean, North Atlantic, Central Atlantic and South Atlantic regions. A national federation is being created to connect all these unions. Individual coaching is provided to the co-operatives, and the support and assistance programme continues with national partners. International co-operation is promoted and encouraged through visits, expertise exchanges with foreign partners, and the organisation of international seminars in Morocco.

Source: Authors' compilation based on a range of interviews. See also (Ministère de l'Agriculture, de la Pêche Maritime, du Développement Rural et des Eaux et Forêts, 2023^[71]).

Support job creation, especially formal wage employment, to make jobs in the sector more attractive

Agro-food value chains, and especially manufacturing of food, food processing and packaging, and retail, would particularly benefit from a job creation and growth model that boosts formal wage employment. This would enable employers to attract motivated workers and invest in developing the skills of their wage employees while wage employees could have access to labour and social protections.

To create wage jobs with decent working conditions, greater effort should be made in the areas of inclusive value chain development (iVCD), which links farmers to buyers and other stakeholders, and engagement in food co-operatives (Christiaensen, 2020^[72]). More generally, governments should prioritise decent, formal job creation and support SME growth in all nodes of the agro-food chain (Fabrizio et al., 2019^[73]). Finally, it is also important to develop a positive image of the whole agro-food sector as being relevant, innovative and attractive (Ryan, 2023^[31]).

Help improving working conditions, including through better labour regulations, social protection and social dialogue

One important way to improve working conditions in MENA countries is to create a solid basis for more effective labour regulations and practices, better social protection and stronger social dialogue. As farms increasingly rely on hired labour, and enterprises in other segments of the agro-food chain develop, labour market regulations become increasingly important in ensuring that wage employees have decent working conditions. As the agro-food sector employs a large share of non-wage workers, it is important to ensure, through other means, that their working conditions are also improved.

- Contractual arrangements

One particularity of the agro-food sector is that, by nature, it relies heavily on temporary labour. Among numerous reasons contributing factors, two are especially influential: the seasonal nature of production; and the purchasing practices and organisation of production within the value chains (OECD, 2023^[74]). Temporary labour may be hired in various ways, including on fixed-term contracts, seasonal contracts or as casual labour, even on a daily basis. Compared to contracts of indefinite duration, these arrangements typically offer a lower level of protection to workers in terms of termination of employment (Aleksynska and Muller, 2015^[75]), poor career prospects and skill development possibilities, and poorer working conditions in general (ILO, 2016^[76]). In all three countries – Egypt, Morocco and Tunisia – labour laws do not place any limitation on the number of temporary contracts an employer can use consecutively; in fact, Egypt has no regulations on temporary contracts (ILO, 2023^[77]). Establishing legislation that ensures appropriate use of temporary labour is a vital first step towards offering temporary workers hope of decent working conditions and prospects for development.

Still, in the vast majority of cases, temporary labour in the agro-food sector is hired on an informal basis (World Bank, 2020^[78]; OECD, 2023^[74]), which means even the few legal rights that temporary workers may have are not enforced. In this regard, laws and regulations should embed self-enforcing mechanisms and be coupled with appropriate enforcement policies.

- Working hours

Non-standard working hours is another particularity of the agro-food sector. In agriculture production, for example, hours may be either too long or too short. In retail, restaurant and catering, workers may be on call or systematically work in shifts at asocial hours, such as in the evenings or on weekends. Very often, enterprises have little guidance from labour law on how to manage working time issues. In Morocco, for example, part-time is not regulated, though interest in regulating it exists (Ministère du Travail et de l'Insertion Professionnelle, 2020^[79]). Better and clearer regulation of working time arrangements – with the aim of providing workers with the principles of equality of treatment, minimum pay and minimum notice – could help protect workers while also allowing enterprises to use non-standard working hours more efficiently. In certain settings, clear regulations on the use of part-time work could help stimulate female employment and may help better reconcile work with family responsibilities (ILO, 2016^[76]).

- Wages and earnings

Low pay is a major factor in the agro-food sector being unattractive to youth. Ensuring and enforcing an adequate level of minimum pay is an important precondition to making employment in the sector more socially desirable.

Having recognised this issue, both Morocco and Tunisia have introduced (in the early 2000s) a guaranteed minimum wage specifically for agricultural workers (SMAG). Morocco has since revised the SMAG several times, with the latest increase being implemented in 2022. Tunisia revises the SMAG levels annually, after consultation with social partners. The SMAG levels also serve as a reference for negotiating and adjusting wages under collective agreements (Lopez-Acevedo et al., 2023^[80]). In both countries, these increases remain modest in real terms and are mainly intended to catch up with inflation. Despite these provisions, many wage employees in agriculture in both Morocco and Tunisia receive less than this guaranteed minimum. This is because, on one hand, compliance with the minimum wage policy remains problematic, especially for small-hold farms that employ workers informally, and or on a seasonal basis, and typically show low productivity. On the other hand, enforcement is difficult, especially in rural areas, where labour inspectorates have limited capacities. Some commentators consider that the SMAG is set at relatively high levels (ibid). Others consider that the existence of SMAGs and their level play an important “lighthouse” role in terms of minimum standards that employers and workers should strive to reach in both formal and informal sectors (Berg, 2015^[81]).

Supporting enterprises, especially SMEs and self-employed workers in the sector is vital to increase their productivity and, in turn, their earnings and wages. Despite the rise of large industrial firms in the MENA region, the agro-food sector will continue to rely on a large share of small-scale actors and family businesses. Government and other sector stakeholders need to find solutions to support these businesses and make them more profitable.

- Occupational safety and health (OSH)

Occupational accidents and work-related diseases have significant consequences for workers worldwide. Young workers experience higher rates of occupational injury compared to adults. Because young workers are still developing physically and mentally, they are more vulnerable to harm from chemicals and other agents (ILO, 2018^[82]).

The agro-food sector is highly hazardous. Agricultural workers face various risks, including working with machinery, vehicles, tools, and animals; exposure to noise; falls from height; heavy lifting; repetitive work; awkward positions leading to musculoskeletal disorders; exposure to dust, chemicals, and infectious

agents; and challenging rural working conditions such as extreme temperatures. The food manufacturing sector also poses significant safety and health hazards for workers, with higher proportions of occupational accidents involving young workers. Hazards in manufacturing include chemical usage; machinery and vehicle operation; electric tools; inadequate ventilation; high noise levels; high temperatures; and poor lighting (ILO, 2018^[82]).

Egypt, Morocco and Tunisia have taken important steps to improve OSH, including in agro-food sector. Morocco established the National Institute of Working and Living Conditions (INCVT) to promote OSH and provides training programmes for employers and workers (ILO, 2023^[83]). Tunisia implemented laws and regulations to ensure OSH compliance in the workplace and established the National Institute of Health and Safety at Work (INRSMT) to promote OSH awareness and provide training (ILO, 2023^[84]). Egypt developed OSH legislation and established the National Institute for Occupational Safety and Health (NIOSH) to conduct research, training and awareness campaigns (ILO, 2023^[85]).

These efforts should continue, taking into account the specificities of hazards and of employment type across the agro-food sector. Involving employers is important in the implementation of OSH prevention methods. In rural areas, governments should act to integrate OSH issues into various types of trainings, including general education, and support awareness raising campaigns (ILO, 2018^[82]).

- Social protection

Throughout the MENA region, a large number of workers in the agro-food sector do not have access to social protection. This happens for numerous reasons related to coverage of existing schemes, informal work arrangements or type of employment. As a result, workers in this sector are unprotected in face of various hazards. To increase coverage by and access to social protection, in its Green Generation 2020-2030 strategy (launched in 2020), Morocco established a new worker status, *l'exploitant agricole* (agriculture exploiter), in order to ensure access to social protection for workers registering under this status. The framework of the same strategy envisages a series of actions to recognise and declare helping family members as employees, also with the objective of ensuring social protection rights (Royaume du Maroc, 2023^[60]).

Efforts should continue, throughout the region, to extend existing social protection provisions to self-employed workers (including own account and contributing family workers) and to SMEs. Additional effort should encourage formalisation of those workers and firms that are, in principle, covered by existing provisions but operate informally.

- Organisation and social dialogue

Throughout the world, primary mechanisms to create regulatory responses for improving working conditions have included worker organisation, representation in new or existing trade unions, and collective bargaining. Worker organisation in agro-food sector, and especially in agriculture, is limited for many reasons, including a poor culture and practice of organisation and limited awareness about the rights to organise. Importantly, this is also linked to the status in employment of a large number of self-employed workers. As such, these workers fall outside the scope of labour laws and often cannot legally be part of a trade union. Nation-wide collective bargaining agreements often do not apply to them, and they do not have a clearly attributable employer who would serve as a collective bargaining counterpart. Another key challenge is of a practical nature, related to the dispersion of workers across different geographical areas, sectors of activity and types of work performed. They may have limited opportunities to organise collective action and it may be unclear which trade union could best represent their interests.

In this regard, co-operatives can play a significant role in allowing workers to organise. Beyond serving their main function of resource pooling and sharing, co-operatives can become privileged interlocutors with the administration, facilitating communication and the implementation of support programmes tailored to the needs of their members. In Morocco, co-operatives in the fishing sector are a successful example of such a dialogue (Box 4.2).

Articulation with other policies and actions aimed at enhancing the socio-economic benefits of the agro-food sector

Channel the development of domestic value chains and activities in non-farm employment to where they deliver the greatest socio-economic benefits

One reason why integration of young people into local value agro-food chains remains largely underexploited is that, currently, a large share of youth, especially outside of big cities, is engaged in the first node – domestic agriculture production. A relatively smaller share participates in productive non-farm employment. To a large extent, this mirrors under-investment in other parts of the value chain, despite their huge potential.

Indeed, as Chapter 3 shows, untapped potential exists for investing in the local value chain of domestic and regional markets. The food industry, especially food processing, is labour-intensive and generally requires a low and medium level of skill. As compared to agricultural production, it is usually more friendly to employing women. To reduce post-harvest waste, it is best to locate this industry close to the production source – i.e. in rural areas and adjacent small towns. As such, the industry can create jobs in small and medium-size towns that can absorb abundant young low-skilled and semi-skilled labour, thereby improving incomes, fulfilling youth aspirations to switch to non-agriculture jobs, and stimulating regional development. It can also help ensure food security in these regions (Christiaensen, 2017^[86]). Finally, it can create strong forward and backward linkages with other nodes of the chain and provide more opportunities for SMEs and smallholders, paving the way for a virtuous cycle of local development (OECD, 2021^[3]).

Invest in larger agro-food chain projects that would otherwise remain underdeveloped

While some production facilities will develop on their own through private investments, national and local governments have a vital role in channelling new production to where its socio-economic impact will be greatest. This can be achieved, on one hand, through better information sharing to private investors as to where the needs and opportunities are the greatest. On the other hand, it also requires massive public investments into larger agro-food chain and related projects that would otherwise remain underdeveloped. Desalination facilities, which play an increasingly important role in sustaining modern agriculture while also providing employment opportunities, is one example (Box 4.3).

In addition, more specific investments are needed to strengthen value chain linkages through logistics and marketing infrastructure, including warehouses, packing houses or cold chains. This infrastructure plays a vital role in enhancing value addition, reducing post-harvest losses, and expanding input market and support services in rural areas (OECD, 2018^[19]). Such linkages can be achieved through PPPs, which may also attract foreign direct investment (FDI). Egypt, for example, is the third-largest recipient of agro-food greenfield FDI in Africa, where such funding plays an important role in logistics and distribution, including through construction of grain silos and barges in Egyptian ports to facilitate imports (OECD et al., 2022^[87]).

In this regard, agro-parks, agro-based clusters, agro-corridors, agro-based special economic zones and agro-business incubators can be interesting solutions to build synergies among agricultural producers and processors, input providers, and the recycling and use of agro-industrial waste and residues. Such linkages naturally also stimulate activity across rural and urban areas (Nogales and Webber, 2017^[88]). By 2022, Egypt had at least 67 industrial zones specialised (at least partly) in agro-food industries, with the largest agro-park in Qalioubeya (OECD et al., 2022^[87]; UNIDO, 2023^[89]).

Box 4.3. Use of non-conventional sources of water for food production delivers direct economic benefits

The value of water for food production

Lack of water security puts at risk agricultural production, which can have significant impacts on the economic stability of households, especially the poorest ones (UNESCO, 2021^[90]). Improving water security for food production can lower poverty by increasing crop diversity, reducing crop failure risk, and improving employment prospects, among other direct benefits. Water also has indirect benefits, such as improving nutrition, creating jobs, and mitigating and adapting to climate change.

Various management techniques can optimise the benefits of water for food production, such as sustainable intensification and increasing knowledge of water use. To satisfy growing demand, especially in metropolitan areas, countries in MENA region have increased reliance on non-conventional sources of water, including desalination and treated wastewater. Around 2020, MENA featured 50% of installed desalination capacity worldwide (Eyl-Mazzega and Cassagnol, 2022^[91]). Desalination facilities are increasingly being used to provide water for agriculture as well.

Desalination facilities in Morocco

In 2022, about 100 000 people were employed in the agricultural sector in Morocco's Chtouka Ait Baha Province, near Agadir. Rapidly declining water supplies are an increasing threat to the sector's viability: in 2008, supply was estimated to be just one-seventh of the level in 1982. Looking ahead, rainfall is projected to decrease over the long term (Assem et al., 2022^[92]).

The Chtouka Ait Baha Province desalination facility, which started operating in January 2022, uses solar energy and an energy recovery turbine. The facility will initially generate an average of 275 000 cubic meters (m³) of desalinated water daily (UNESCO, 2021^[90]), providing drinking water to over 2 million people across the Souss-Massa region (UNESCO, 2021^[90]). According to Nizar Baraka, Minister of Water, the country plans to install some 20 desalination plants by 2030 to address problems related to the lack of water (Yahya Benabdellah, 2022^[93]). The national water and energy provider and the Moroccan Ministry of Agriculture, Maritime Fishing, Rural Development, Water and Forests have entered into a PPP.

An important change is that farmers in the area were used to getting water for free while paying fees for significant infrastructure and running expenses to use water. Developers have worked with farms to demonstrate the hidden cost of water, which had the effect of reducing what was originally thought to be the cost advantage of desalinated water. In turn, they negotiated a tariff with farms and a government subsidy that partially covers the higher price of desalinated water. Around 45% of the desalinated water produced at Chtouka Ait Baha Province desalination facility is used to irrigate 15 000 hectares of land with crops that have high water usage but all deliver high added value, primarily citrus fruits and vegetables (Assem et al., 2022^[92]).

Source: Authors' compilation.

Invest in infrastructure in rural areas, develop secondary towns and rural-urban linkages

One reason rural youth show disinterest in agriculture – and migrate to urban areas – is the general underdevelopment of rural areas. This concerns, first and foremost, productive infrastructure such as electricity, piped water, basic sanitation facilities, roads, telephone and broadband connectivity. These

facilities and services are key to augmenting productive capacity and diversification of domestic agriculture production and linking it to the rest of the value chain. They also improve quality of life in rural areas.

Development of medical and education facilities, including affordable and reliable childcare, is also important to make rural areas more attractive for daily life, improve labour force participation of women, and reduce the isolation of small farmers.

In addition to developing rural infrastructure, unlocking the youth employment potential can greatly benefit from directing resources and investments to developing secondary towns. For small-hold farmers and processors, such towns have strong potential to offer local markets while also serving as a stepping stone into national and regional markets (OECD, 2016^[94]; OECD, 2022^[95]). In turn, they have potential to create job opportunities in non-farm employment, especially in retail and food consumption sectors – again responding to youth aspirations to switch to better-paying jobs and more vibrant lives.

Support the adoption of digital technologies throughout the agro-food sector

Egypt, Morocco and Tunisia are experiencing the start of the digital technology revolution in the agro-food sector (Box 4.4). All three countries are taking steps to adopt new digital agriculture technologies including precision agriculture, e-extension services (both public and private), e-finance services for farmers, and e-commerce applications to expand market access (FAO, 2020^[96]).

Many of the e-finance and e-commerce services are still at the initial stages of development in Egypt, Morocco and Tunisia. Their current development is uneven across countries, but their use is expected to expand rapidly (FAO, 2020^[96]; Trendov, Varas and Zeng, 2019^[97]). Some technologies already proved to be particularly useful during the COVID-19 pandemic in MENA region (Elsabbagh, 2021^[98]), saving crops from being wasted and sustaining the livelihoods of farmers. When faced with throwing away significant parts of their harvests during the crisis, farmers used digital platforms to find buyers for their produce (Lampietti, El Abed and Schroeder, 2020^[99]).

Box 4.4. Examples of digital technology adoption in the agro-food sector in Egypt, Morocco and Tunisia

Egypt

Among 11 countries in the Nile Basin, Egypt has the largest irrigation area. As part of a comprehensive national strategy to employ modern irrigation techniques, in 2020, the government initiated a pilot programme for a novel mobile-based irrigation system. Collaborating with Cairo's MSA University, the Ministry of Water Resources and Irrigation developed a handheld device capable of measuring moisture levels in agricultural soil. This device sends timely notifications to farmers' mobile phones, enabling them to make informed decisions regarding their crops based on water levels (Tricarico, 2021^[100]).

Involvement of the private sector is crucial to promoting smart farming initiatives. An app called IrriWatch, developed in the Netherlands, helps farmers optimise their irrigation practices by using “virtual sensing” technology that combines measurements from various thermal satellites to detect soil water potential and moisture data. Advanced remote sensing algorithms analyse the data to infer evaporative cooling, sap-flow and root zone soil moisture conditions. This information, along with weather forecasts, is then used to determine the need for irrigation in the next 24 hours. The IrriWatch App, available for free download online or through a web application for tablets or laptops, offers guidance on the recommended minimum and maximum amount of irrigation water. Even farmers with limited digital skills can benefit from such technology to optimise field irrigation (Tricarico, 2021^[100]).

Vodafone Egypt, a prominent mobile operator, is using its extensive coverage in rural regions to offer agricultural advice to small-hold farmers through daily SMS messages. With the Ministry of Agriculture, Vodafone introduced a service called “Egyptian Farmers” to provide this support (Tricarico, 2021^[100]).

Morocco

Smart farming is a key focus for the government, evident in its launch of the “Green Generation 2020-30” strategy in 2020, which encompasses goals such as introducing new technologies and digitising agricultural services. One main objective is to install over 100 000 solar pumps for irrigation.

AgriEdge, an agritech startup, stands to gain from this initiative. They offer a precision agriculture platform that uses various data sources – such as weather, satellite imagery and drone images – to determine optimal levels of fertiliser and water for each crop.

Tunisia

Tunisia boasts several innovators in the field of smart farming. One company, Ezzarya, specialises in installing sensors in irrigation pipes and soil to enhance agricultural practices by giving farmers the ability to monitor and regulate soil salinity. As needed, they can then inject mineral salts to enhance crop yields. The system facilitates centralised management of irrigation and fertilisation processes, while also detecting and identifying drip leaks, triggering rapid repair for efficient resource utilisation.

Herundo is another noteworthy example in Tunisia’s smart farming landscape. The company offers e-commerce services specifically tailored for the National Olive Oil Exporter Association. Their business-to-consumer platform aims to broaden market access, lower transaction expenses, capitalise on economies of scale and enhance branding efforts. By leveraging digital solutions, Herundo aims to facilitate efficient and cost-effective export operations while boosting the visibility and reputation of olive oil products (FAO, 2020^[96]; Bravi and Sylvester, 2020^[101]).

Source: Authors’ compilation.

Despite recent progress and innovations, numerous hurdles constrain development of digital skills and wide adoption of digital agriculture technologies throughout the agro-food sector in Egypt, Morocco and Tunisia. These include farmers’ resistance to innovative technologies (Blaise, 2020^[102]), a lack of good Internet connection and digital services in rural areas, legal and regulatory obstacles, and logistical and administrative barriers to entry (Bravi and Sylvester, 2020^[101]; Elsabbagh, 2021^[98]). Internet content in local languages, such as Arabic, remains limited and useful Internet platforms in the region are scarce. In rural areas in particular, education systems have not provided local young people with the skills needed to use technology effectively to access information and build networks.

The stakes of non-adoption or low adoption of digital technologies, especially because of the lack of digital skills, in MENA countries are high (Klerkx and Rose, 2020^[103]). The agro-food sectors may lose competitiveness, fall further behind other countries and miss out on lucrative export markets (Bahn et al., 2021^[104]).

Technology also has potential to significantly expand the opportunity space for rural youth in MENA countries; in fact, this segment of the population is best positioned to take advantage of new ICTs that can increase the competitiveness of rural communities.

If MENA countries are to pursue digital agriculture, public and private actors alike will need to partner and keep pace with fast-moving technology actors (Bravi and Sylvester, 2020^[101]).

Adopt necessary food safety and environmental laws and standards

Finally, to help increase demand for agro-food products, governments have an essential role in setting and harmonising environmental standards, as well as standards governing animal and plant health, food quality production, and traceability. It is equally important to ensure compliance with these standards.

From the perspective of processors, traders and food retailers, standards and their related labels offer recognition of aspects such as quality assurance and product differentiation. Ultimately, they can reassure consumers and encourage them to shift to certified, healthier products (Rousset et al., 2015^[105]).

For producers (farmers and companies in agro-food processing and packaging business), clear and transparent environmental, hygiene and food quality standards and regulations can provide a major stimulus for change, such as adopting relevant technology and production methods. In turn, this can facilitate access to lucrative markets and supply chains (Rousset et al., 2015^[105]). Standards are indeed critical to developing a competitive and sustainable food sector – but only if they are respected, enforceable and enforced (ETF, 2021^[106]).

That said, environmental, hygiene and food quality standards need to be realistic and applicable to small-hold producers and local SMEs. Complicated food safety regulations will likely exclude small-scale and low-income producers, as well as the dense network of informal traders and SMEs (OECD, 2021^[3]). Indeed, increasingly complex regulations in the food processing segment carry the risk of accelerating consolidation of the sector towards large-scale processors, in turn triggering the disappearance of many small firms (Reardon et al., 2014^[107]).

Improving food standards in MENA countries may have significant impacts on the domestic food industry. They can contribute significantly to sustainable development and upgrading supply chains (OECD/FAO, 2016^[108]), eventually stimulating and helping to upgrade exports, including to the European Union (EU), MENA's main trading partner.

Morocco, for example, has substantially updated its food safety legislation, exemplified by implementation (in 2010) of the *Loi n° 28-07 "relative à la sécurité sanitaire des produits alimentaires"* (van Wagenberg et al., 2012^[109]). This legislation mandates that food business operators adopt self-control systems for food safety authorised by the competent authority, thereby ensuring a comprehensive approach across the entire supply chain. Additionally, it requires farmers to keep records of fertiliser and pesticide usage, promoting accountability and transparency. Morocco took a further step by establishing the *Office National de Sécurité Sanitaire des Produits Alimentaires* (ONSSA), a national food safety authority (van Wagenberg et al., 2012^[109]). This demonstrated the country's commitment to ensuring the highest level of food safety standards. Implementing such quality standards and controls needs to be well accompanied by developing clear and easy-to-understand food safety and hygiene guidelines and raising awareness about associated legislation.

Concluding remarks

This chapter shows that the agro-food sector can become a viable solution for youth employment in the MENA region, while also responding to developmental, climate and technological imperatives. For this to happen, governments must be proactive on many fronts. Improving the skill match and ensuring that young workers are equipped with the right skills for the new and emerging demands of the sector is one policy area. But perhaps even more important area is boosting the development of the domestic components of various agro-food value chains, with the view of creating greater and better economic opportunities for young people.

Importantly, the flourishing of the agro-food sector cannot be relegated uniquely to ministries of agriculture. Co-ordinated approaches are needed, involving the ministries of education, youth, transportation, finance,

economic planning, and trade to collaborate on elaborating a common vision for the agro-food sector in broader socio-economic development. Such co-ordinated approaches should ensure that all segments of the value chain develop in parallel, that labour is well matched to jobs, and that environmental policies are shared and applied widely by all actors.

Providing access to information and elaborating sector-specific plans with involvement of all stakeholders – and especially young people – is also one of the secrets to making the full agro-food chain flourish.

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