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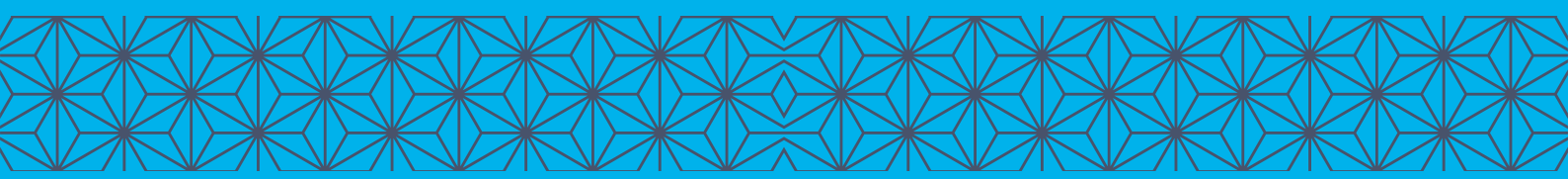


UNOPS

# Post Covid-19: Opportunities for Growth, Regional Value Chains and Mediterranean Integration



February 2022





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## Foreword

### **Blanca Moreno-Dodson, CMI Director**

From Marseille to Cairo, through Beirut and Tunis, and across the Saharan desert and the many islands in the Mediterranean, there is no one community in the region that was not affected by the consequences of contagion, lockdowns, job losses, supply chain disruptions, and deviation of resources towards emergency solutions as a result of the COVID-19 pandemic. Before this unprecedented crisis, the Center for Mediterranean Integration (CMI) focused on enhancing regional integration as the catalytic factor that will trigger socio economic transformation and build the resilience of the region to external shocks. Not having achieved those goals yet, now we urgently need to add one more layer of resilience and recovery so that Mediterranean societies can thrive in the wake of this major health shock which, otherwise, risks erasing any progress previously made.

The crisis is highlighting the fact that health systems are weak, lacking solid investments and failing to serve entire populations in an equitable manner. The precarity of jobs for the most vulnerable, many of them women, has also shown us how easy it is to fall into the poverty trap. Meanwhile, some countries are wondering whether they will be able to afford importing basic food items they are not producing at home. These issues are being addressed in this report, underlining that responses must come necessarily from policy dialogue and collaboration across countries. Concretely, trading products and services among neighbors

could provide rapid and effective solutions. In that sense, the crisis could constitute a unique opportunity window for enhancing regional integration. Our report investigates the new challenges for global value chains and proposes concrete and immediate “niche” opportunities for economic integration between the EU and Mediterranean countries.

Capitalizing on the knowledge and technical excellence of the CMI and FEMISE teams, our aspiration is that this report will be useful for those stakeholders that seek to seize existing opportunities to increase trade and, more broadly, collaboration and integration between EU and Mediterranean countries.

### **Ibrahim Elbadawi, FEMISE President**

The past two years have challenged the resilience of the Mediterranean region as countries and communities were strongly hit by the negative impact of the pandemic. However, there are many reasons to be optimistic about how the region will come out of this global crisis.

The pandemic forced governments of the South Med region to act quickly and use innovative ways to mitigate its immediate impact across all sectors: from health and education to trade and production. This showcased an unprecedented capacity of these governments to mobilise, coordinate and implement agile and innovative policies to protect their population and their businesses. This ability to create targeted and effective policies should continue to be the driving force for the South Med governments, as they come out of this crisis.

Many opportunities are presenting themselves “up for grabs” to the South Med countries within this crisis. However, governments need to act quickly and reset their priorities if they are to seize these opportunities, which will help restore the resilience of their economies.

FEMISE has been advocating the importance of regional integration, inclusivity in its broader meaning (particularly for women and youth), private sector participation, innovation-led growth and sustainable development. This report brings forward many of these issues by diving into the root causes of some of the challenges that the region is facing and that were exacerbated by the pandemic such as food security, the fragility of the health sector and the stagnant trade integration. The report

highlights the many opportunities available for the South Med countries on how to move forward: from ways to improve on food security capacities, to digitalization of the health sector, to the prospects of the pharmaceutical sector and ways to deepen EU-Med integration through prioritising shorter regional value chains.

We are delighted to join the CMI team in bringing forward this timely report, which we believe will contribute to the better understanding of the many current challenges facing our region and of the opportunities that exist. Most importantly, the report provides recommendations to the stakeholders and the policy makers on how to seize these opportunities towards achieving a more sustainable and resilient region.

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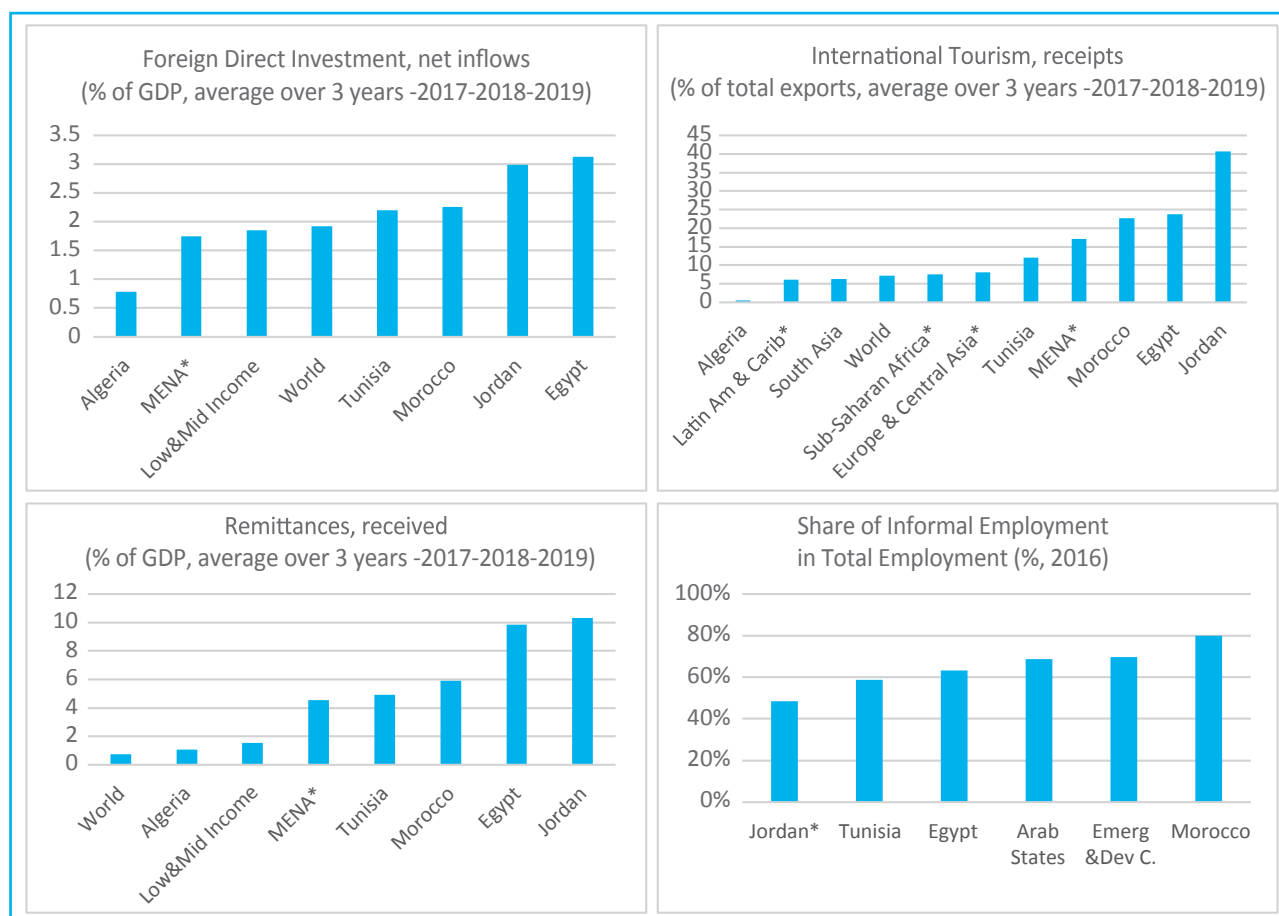
## Introduction

The economic and social costs of the pandemic will be very high in South and East Mediterranean countries. In addition to the effects of national measures taken to contain the pandemic (national and international travel restrictions, lockdowns, curfews, closure of certain activities, etc.), low and middle-income countries are also suffering specific negative effects that are amplified in this region, owing to:

- **The sharp fall in foreign direct investment (FDI)**, while these same FDI inflows by which inflows represented on average 3.1% of GDP in Egypt, 3% in Jordan, 2.3% in Morocco and 2.2% in Tunisia over the three-year period preceding the pandemic, above the average for comparable income level countries (1.8% of GDP) (Figure 1). A recent World Bank report (2020) indicates that FDI inflows to non-oil producing MENA countries, between January and June 2020, accounted for only one quarter of the inflows recorded during the same period the previous year. This recent trend in foreign investment in the region has contributed to the decline in growth and integration prospects in the region.
- **The massive drop in remittances**, linked to the significant slowdown in economic activity around the world and the volatility of oil prices. Previously, with the exception of Algeria, remittances represented a higher share of GDP in the region than in all comparable income countries: more than 10% in Jordan, 9.8% in Egypt, 5.9% in Morocco, 5% in Tunisia, as compared to 4.5% for

MENA as a whole and 1.6 percent for all low- and middle-income countries (Figure 1). Although a 20% decline was estimated for 2020 (World Bank, 2020b), the forecasts for 2021 were more favorable.

- **The collapse of the tourism industry.** For these countries, with the exception of Algeria, tourism represents an even greater source of income than in other regions. Over the three years preceding the pandemic (from 2017 to 2019), tourism accounted on average for almost 41% of exports for Jordan, 24% and for Egypt, 23% for Morocco and 12% for Tunisia. The average for MENA countries was 17%, i.e. more than double that of other regions with similar income levels (Figure 1). The consequences of the sudden and prolonged halt in tourism activities have affected economic growth and employment, with negative impacts on inequality.
- **The very large proportion of the population working in the informal sector and who are therefore highly exposed and vulnerable.** According to ILO estimates (2018), the percentage of people working in the informal sector in Morocco amounts to almost 80%, while this figure is 63% in Egypt, 59% in Tunisia and 48% in Jordan (Figure 1). This proportion is around 70% for low and middle income countries). While the countries of the region had managed to reduce poverty relatively better than in the rest of world, the impact of Covid-19 has pushed these vulnerable populations over the threshold into extreme poverty.

**Figure 1. Factors amplifying the negative impacts of the pandemic**


For the first three graphs:

Source: WDI, World Bank

\* Excluding high income.

The group of Low and Middle Income is not available for the receipts of International tourism.

For the last graph:

Source: ILO calculations based on national labor force or household survey data.

\* 2018 for Jordan in ILO Stats.

The Covid-19 crisis has hit the economies of Mediterranean countries that were already struggling, where GDP per capita grew by only 1.9% on average annually between 1995 and 2017, compared to 4% for comparable income level. The growth rate of exports has been consistently lower, on average, over

the past fifteen years than that of other middle-income countries, and the region's trade deficit has continued to grow<sup>1</sup>. Unemployment rates have remained very high over the past decade, especially for young people and graduates (27% and 29% respectively on average for the region in 2107). Horizontal inequalities<sup>2</sup>,

1. These data are from the Femise report (2019a). For more details on the economic situation of the Southern Mediterranean countries before the Covid-19 crisis, see Chapter 1 of this report.
2. Vertical inequalities are related to differences in income (or wealth or spending). Horizontal inequalities refer to all the other factors that can foster a sense of inequality or inequity between populations, such as differences in access to education, health, employment opportunities, etc.



more specifically in the field of health and education, are increasingly felt and resented by the populations. The number of people, in particular women and youth, who are excluded from an economic system that is at once sclerotic and suffering from a severe health and economic crisis for a period that remains uncertain, will continue to increase and everything suggests that more and more young people will be potential candidates for forced emigration. It is also possible that despair, poor job prospects and the lack of opportunity for economic and social integration, might push the young into the hands of extremist groups, thus creating a risk of political instability in these countries, which is even more difficult for decision-makers in the region to manage in the current context.

Prior to the pandemic, a large body of work sought to identify the causes behind the low growth and lack of jobs in the region. Examples include the World Bank report (2016) and the Femise report (2019a). We know that these poor performances are related to a series of problems essentially linked to the business environment (access to financing, administrative red tape, access to land, logistical problems, a training system that is poorly adapted to the needs of businesses, the high incidence of informal work, corruption, etc.) and the lack of competition for the private sector given the excessive weight of the state in several countries. Weak integration among countries in the region, be this in the field of trade

or other socioeconomic aspects, has also contributed to a level of growth that falls short of the region's potential.

Beyond the development of trade between Mediterranean countries, the region needs greater South-South and North-South cooperation, as emphasized by the CMI report (2020), for the promotion of regional investment flows to finance joint projects and enable speedier technology and know-how transfers on a larger scale than achieved so far. This strengthening of regional cooperation is essential to encourage North-South and South-South co-production systems, to launch large-scale projects in specific sectors (energy, agriculture and agri-food, pharmaceutical industry) and thus favor the socio-economic transformation of the region. The same imperative is also emphasized in the latest joint CMI-World Bank MENA Economic Update report (2020).

This work is therefore an extension of these reports and aims to highlight the common interest of regional integration which, aiming at a more sustainable and inclusive development of the Mediterranean region, must go beyond the development of trade in goods and services, and the technical aspects of trade facilitation alone.

Given the current context, the objective of this report is to underscore the vulnerability of Mediterranean countries in two key areas, namely food security and health, and to reassess new opportunities for deepening

regional cooperation, particularly in the face of the Covid crisis. Thus, the aim is (i) to analyze the specific needs of Mediterranean countries related to food security and health and to distill policy options for South-South and North-South cooperation, and (ii) to identify medium-term opportunities to increase trade integration, more broadly, collaboration between EU and Mediterranean countries.

The report is organized into three chapters. The first focuses on the current food security situation in the Mediterranean. The second investigates the new challenges for value chains and economic integration in the Mediterranean countries, while the third looks at the health sector in the Mediterranean region in the face of the Covid-19 crisis, highlighting the challenges and opportunities for improvement in this sector.

## References

- World Bank (2020) Trading Together: Reviving Middle East and North Africa Regional Integration in the Post-Covid Era, MENA Economic Update, October.
- World bank (2016) What's holding back the private sector in MENA? Lessons from the Enterprise Survey, with European Bank for Reconstruction and Development and European Investment Bank.
- World Bank (2020b) Covid-19 Crisis through a Migration Lens, Migration and Development Brief 32, Avril.
- CMI (2020) Enhancing Mediterranean Integration, Center for Mediterranean Integration, Marseille.
- Femise (2019a) The Private Sector in the Mediterranean Countries: Main Dysfunctions and Opportunities for Social Entrepreneurship, Coordinated by P. Augier, Femise Euromed Report.
- OIT (2018) Women and Men in the Informal Economy: A statistical Picture, Geneva: ILO.

# Chapter 1. Food security in the Mediterranean during the Covid-19 crisis

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## Key points of the Chapter

- Food security should not be understood in the sense of self-sufficiency. Its ultimate goal is to guarantee the availability of food with a sustainable level of dependence on food imports while ensuring access to quality food for all.
- An assessment of food security in the Mediterranean region highlights its fragility: (i) The countries of the region depend heavily on cereal imports, even though they form part of their staple diet, (ii) populations are highly vulnerable to extreme poverty, which weakens their access to food.
- The Covid-19 crisis is having a negative impact on food security in the countries of this region, increasing the incidence of poverty. We may expect to see increasing malnutrition among the region's populations while the economic crisis, caused by the pandemic, remains ongoing.
- Food security can be improved in these countries by (i) increasing production through an agricultural strategy designed to cope with scarce water resources and climate change, (ii) continuing to stamp out poverty, (iii) improving logistics, (iv) reviving the Mediterranean diet and (v) enhancing regional cooperation.

## Introduction

Food insecurity has once again been rising globally since 2015, as a result of climate-related disasters, particularly in Southern Africa and Central America, and civil wars in the Horn of Africa, the Sahel and the Middle East. The pandemic that broke out in early 2020 has exacerbated this worrying trend. The South-East Mediterranean, which is at once highly dependent on food and exposed to economic risk (notably due to the prevalence of informal work, high unemployment rates and very low labor force participation rates), as well as to risks related to climate change (which have been found to be higher than in other regions of the

world), deserves special attention in this regard.

After recalling the challenges of food security (section I), we will measure its level in the Mediterranean countries on the eve of Covid-19; we will then highlight the risks of weakening food security in the region as a result of the pandemic (section II). Since this global crisis is not the only one underway, we shall therefore broaden our reflection to consider ways in which food security could be improved, while taking into account climate change and the scarcity of water resources (section III). In the final section (section IV), we will present a series of recommendations.

## I. Is food security being threatened?

### I.1. The food security concept

Feeding ourselves is an essential daily necessity that cannot be avoided by political agendas. The states are fully aware of its importance as civic security and a certain form of state sovereignty figure high among the related stakes. In the wake of independence, Southern and Eastern Mediterranean Countries (SEMCs) often insisted on the need for a certain level of self-sufficiency. After centuries of tutelage, gaining autonomy from the former powers of occupation was a matter of political independence. Syria, Egypt and Morocco, for example, have shown boldness in this area with varying degrees of success. In all cases, they have sought to raise their level of agricultural productivity through hydro-agricultural investments. Morocco has thus transitioned from 150,000 hectares of irrigated farmland, at the end of the French protectorate, to over 1.5 million hectares today. Egypt has greatly increased its irrigated surface areas, not by extending the amount of land irrigated (horizontal extension), but by doubling or even tripling the crops grown on the same amount of land (vertical extension). In Syria, the creation of irrigated land along the Orontes and Euphrates rivers, as well as the use of ground water, allowed access to food self-sufficiency until the country was hit by a drought between 2006 to 2010, which greatly reduced production and was among the root causes of armed conflict.

Food self-sufficiency has thus been the hallmark of many states in the region. But demographic growth (the population has increased fivefold since 1950) has made this difficult.

Countries have thus sought to focus their agricultural production on goods for which they have the necessary comparative advantages to export and earn foreign exchange, even if this means importing other commodities for which they are insufficiently competitive. This economic extraversion of agricultural sectors has thus shifted the States' objectives from self-sufficiency, with strong political overtones, to that of food security, a notion that has been progressively defined and advanced by researchers and international institutions since the end of the 1970s. This paradigm shift is also linked to the work of Indian researcher Amartya Sen, who has shown that hunger is less a problem of food availability – the ultimate goal of self-sufficiency programs – than of access to food for the most vulnerable populations. Even if a country is self-sufficient, there is no guarantee that its population can meet its dietary requirements. After focusing on national self-sufficiency goals, the individual dimension of “access to food” has gained momentum among researchers and international institutions alike.

For these reasons, the notion of food security became popular from the late 1970s onwards, although it took some time to find a unanimous definition. Indeed, the concept evolved considerably from its inception until



1986, when a definition was finally adopted by the World Bank in its report *Poverty and Hunger*. In this sense, food security became the “access by every individual, at all times, to food resources for an active and healthy life”. Ten years later, at the World Food Summit in Rome, the definition was further clarified: “Food security exists when all people, at all times, have the physical, social and economic possibility to gain access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”. This definition, which is still in use today, is based on the four pillars established hereafter:

- Availability, i.e. sufficient quantities of food, whether from domestic production, stocks, imports or aid;
- Access, i.e. the ability to produce one’s own food and therefore have the means to do so, or the ability to buy one’s food and therefore have sufficient purchasing power to do so;
- Quality food and diet from a nutritional and health perspective;
- Stability of access and therefore of prices and purchasing power, availability and quality of food and diets.

Food security is therefore not only a health and a social concern, but also a political one, as it affects the country’s stability. We may recall the quotation by Josué De Castro in his book *“The Geopolitics of Hunger”*, published in 1952. For this expert who raised the world’s awareness of the problems of hunger and underdevelopment, “few phenomena have influenced the

political behavior of people as intensely as food and the tragic need to eat.”

## I.2. The challenge for the countries of the region

This concept of food security clearly illustrates that the primary question is not one of national production, but of regular access for all, both in quantity and quality. In the Southern and Eastern Mediterranean countries, which are known to be highly dependent on agricultural imports, food availability has been facilitated by purchases on world markets, even if this has meant the implementation of import subsidy systems to cushion against rising prices.

Until the mid-2000s, world markets experienced few price shocks, which was to the advantage of high import countries. In a context where the agricultural policies of the United States and Europe were inclined towards productivism, based on a system of guaranteed prices, their trade dynamics did indeed tend to impede increases in agricultural prices. This was achieved thanks to massive stocks, which they could dispose of on world markets even if this could prove costly. Thus, for example, large quantities of grain and milk, previously strongly subsidized by these two major players in agricultural trade, were sold at a loss.

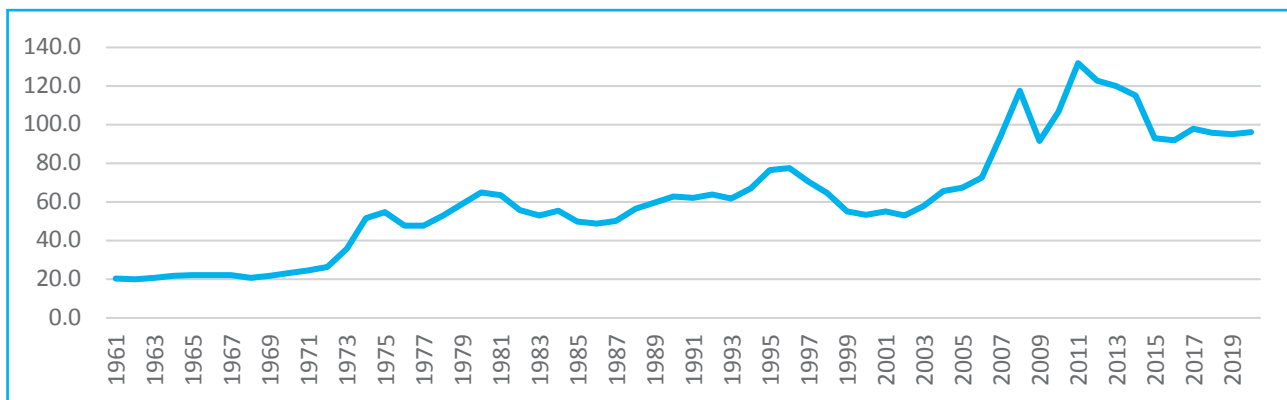
However, this trade war and the productivist dimension of these two systems were challenged by the 1994 Marrakesh agreements, which gave birth to the WTO and its regulation of agricultural products. Since the stocks could no longer be sold off, they were gradually reduced. The

idea was, among others, to limit heavily subsidized exports from these major agri-exporters in order to align agricultural trade with free trade rules. It was also expected that these new practices would raise prices to better reward farmers from developing countries, who constituted the bulk of the world's poor and were thus among those most affected by food insecurity.

These new WTO rules, which put an end to agricultural dumping, were intended to counteract agricultural deflation. In 2007-2008, the world experienced a first price surge coinciding with the global crisis.

We now understand its causes, in which structural factors played an important role, and shall therefore briefly describe them hereafter. On the one hand, large countries such as China and India have seen their demand for food products increase, more as a result of their food transition towards richer diets than of their demographic transition, which is already very advanced (India) or even complete (China). On the other hand, the orientation of agricultural development policies has led some countries to favor cash crops to the detriment of staple products, including cereals, in order to improve their capacity to repay their external debt.

**Figure I.1. Long-term evolution of the world food price index (1961-2019)**



Source: *Annual FAO Food Price Indices (2014-2016 = 100)*.

Cyclical factors also contribute to this cluster of causes. Climate shocks affect production and subsequent losses cannot always be cushioned leading to the subsequent depletion of stocks enforced by Europe and the United States, and the subsequent depletion of stocks.

Moreover, the concomitant correlations between the rise in oil prices and those of agricultural products cannot be ignored, as agriculture tends to be highly carbon

intensive, from the manufacture of agricultural inputs to mechanization.

In addition, agricultural land once used for food production was converted to the production of agrofuels, thus reducing food production. The upward market also gave rise to speculation, which in turn bolstered the trend. Indeed, derivative markets operate in such a way that the risks related to price fluctuations can be hedged, but this was distorted by the influx of capital attracted by the possibility -

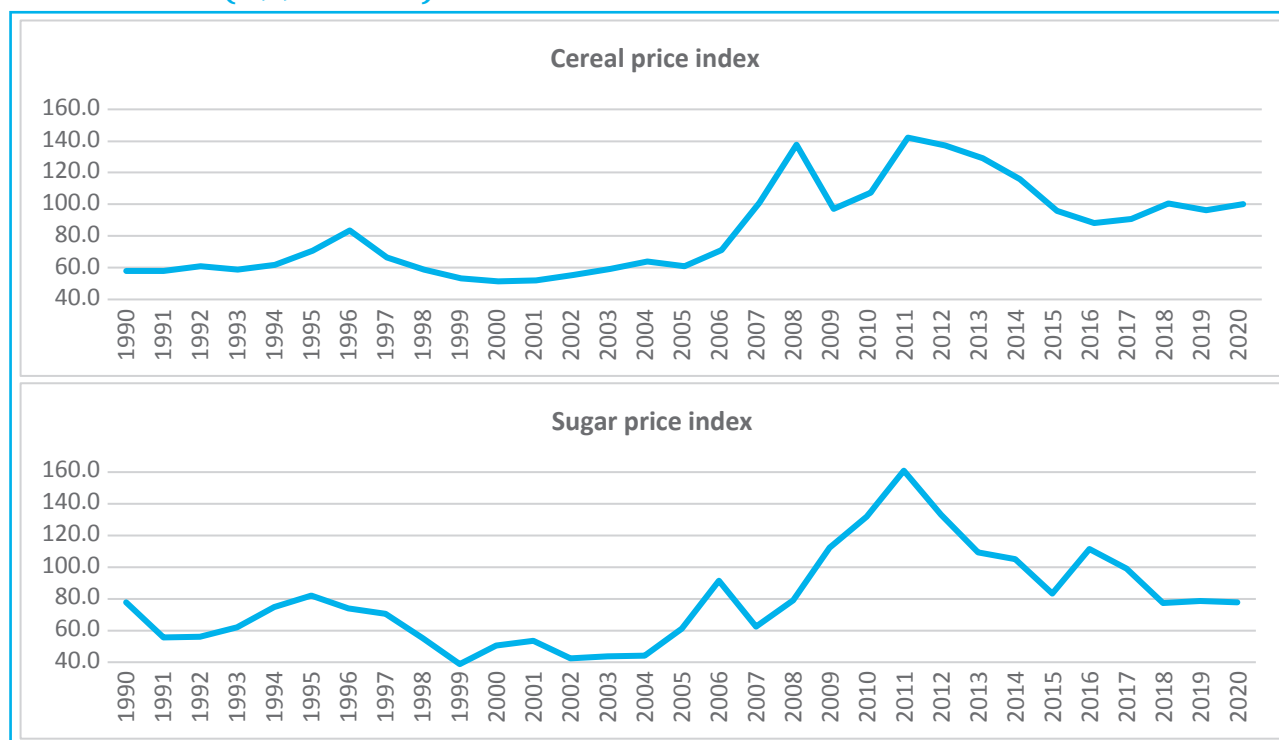
apparently reinforced by globalization - of investing in commodities without ultimately having to buy them<sup>3</sup>. Finally, certain States reduced their exports to preserve their stocks while prices were soaring.

Farmers, who had long been at the forefront of food insecurity, have not benefitted from this surge, as their constraints go far beyond the simple price of agricultural products. As for the urban populations, which were long spared thanks to low-priced imports, some found themselves suddenly, albeit momentarily, at risk of food insecurity. As this affected urban areas where social mobilization is facilitated by population density, the repercussions have been sometimes brutal, leaving a trail of victims in South America - Mexico in particular - sub-Saharan Africa, Asia and, to a lesser extent, in the Mediterranean. Indeed, in the SEMCs, State intervention worked hard to cushion this shock, notably by increasing import subsidies.

The same thing happened again, some two years later between 2010 and 2011, when a further spike in prices occurred. As the previous two decades were marked by frenzied uprisings in Egypt, Tunisia and Jordan, this second shock could be interpreted as one of the reasons for the Arab Spring. From Morocco to Egypt, from Tunisia to Syria, throughout the Arab world, governments increased their subsidies in January 2011, hoping that this would extinguish the first stirrings of revolt. But nothing could halt the movement, at least in the countries where revolt was rife. This proves that the causes were more complex, notably associated with cases of authoritarianism. However, the agrarian situation contributed to the fueling of criticism, like in Syria, where peasants long privileged by the regime were exposed to economic liberalization during a severe drought. Over the decade following these events, however, agricultural price trends have become less buoyant, as shown by the evolution of world grain and sugar prices in Figure I.2.

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3. A US Senate report published on 24 June 2009 concluded that in 2008 “The activities of commodity index traders, by and large, constituted excessive speculation in the Chicago wheat market. Indeed, reflecting the upward trend produced by derivative market operations, the futures prices remained higher at contract expiry than the physical market price, whereas they should be aligned. The price differential has even fallen from 13 cents per bushel in 2005 to \$1.53 in 2008, a phenomenon ‘largely’ due to the influx of capital diverted to commodity index contracts, the Senate report concluded. It therefore recommends phasing out the exemptions granted by the Commodity Futures Trading Commission (CFTC) to traders in these indices, which allow them to trade without position limits.” *Le Monde* 30 June 2009

**Figure I.2. Evolution of cereal and sugar price indices on the world markets (1990-2020)**

Source: Annual FAO Food Price Indices (2014-2016 = 100).

For the SEMCs whose dependency has continued to grow in line with their growing populations, this downward trend has come at the right time. However, their food security has at times deteriorated significantly. In Syria and Libya, civil war has plunged millions of people into food insecurity, hunger and even famine<sup>4</sup>. As for Lebanon, the financial crisis that has rocked the Land of Cedars since 2019 has driven a large part of the population to ruin, plunging them into food insecurity. These are extreme cases, but nevertheless remind us of how fragile access to food remains in the SEMCs, at a time when the Covid-19 pandemic, a tragic new episode in contemporary history, is posing a very real threat in terms of food insecurity. We will thus take stock of the food security situation in the region prior to the outbreak of the pandemic.

## II. An evaluation of the food security in the region and the COVID-19 risks

This assessment of the food security situation in the region prior to the pandemic will focus on five countries (Algeria, Egypt, Jordan, Morocco and Tunisia), in line with the choice made in this report.

Although the Covid-19 pandemic has not incurred the same food risks - as we will see later - the crisis of 2007-2008 might well be replicated in the region, especially in the context of climate shocks.

As already mentioned, the development of the concept of food security leads to a distinction between (i) the national dimension, which reports on food availability and assesses whether countries

4 We may recall what happened in the Yarmouk camp, placed under siege by the authorities in July 2013.



have enough food to meet the needs of their populations, whether through domestic production or imports and, (ii) the individual dimension, which refers to the population's standard of living and indicates whether all the inhabitants of a country have access to food products in sufficient quantity and quality. National food security is therefore a necessary, but insufficient, condition to guarantee individual food security. We shall analyze the food security situation

in Mediterranean countries by assessing these two dimensions, in order to better understand the key impacts of the Covid-19 crisis on the region. It should be noted that, since this study focuses on food security, we have chosen not to include the sustainability index (Food Sustainability Index, briefly presented in the following box), as it is a little too far removed from the subject of our work. Moreover, the large number of indicators included in this index makes it difficult to interpret.

### **Box 1: The Food Systems Sustainability Index: a new approach to assessing a country's food situation**

The Food Sustainability Index (FSI<sup>5</sup>) of the Barilla Foundation and The Economist assesses not food security but food sustainability. This database was compiled with the participation of 67 countries, including 4 of the 5 countries included in our study, as Algeria is not mentioned. The index is based on three sub-indices: food loss and waste, sustainable agriculture and nutritional challenges. These sub-indices are derived from the aggregation of a very large number of indicators that are not always related to the food security issue itself.

However, the results of the different countries in the region are very similar, with a score of 63.5 for Morocco (ranked 47th) and 62.3 for Tunisia (ranked 52nd). Egypt is ranked 48, Jordan 50 and Lebanon 51. Internationally, France has the highest score of 76.1 and the United Arab Emirates has the lowest score of 52.3, as the country is strongly challenged by the sustainability its agriculture. Among the three components of the index, nutrition weighs down Egypt (54.8) and to a lesser extent Morocco and Jordan (58.8 and 58.9 respectively), in line with the results we are going to describe. The loss and waste component, while it may be improving, is around 62-63 for these countries, but this does not make it the most damaging factor. This is even truer for the sustainable agriculture component, which varies from 64 in Jordan to 70 in Tunisia.

#### **II.1. The national dimension of food security: assessing availability**

According to the food availability indicator<sup>6</sup> presented in graph I.3, each individual benefits, on average, from a very satisfactory level of nutrition

(expressed in kilocalories) in the five countries studied: All, except Jordan, have a number of kilocalories available, per person and per day, that exceeds the world average. However, the informative value of this indicator remains limited. On the one hand, it

5 <https://foodsustainability.eiu.com/>

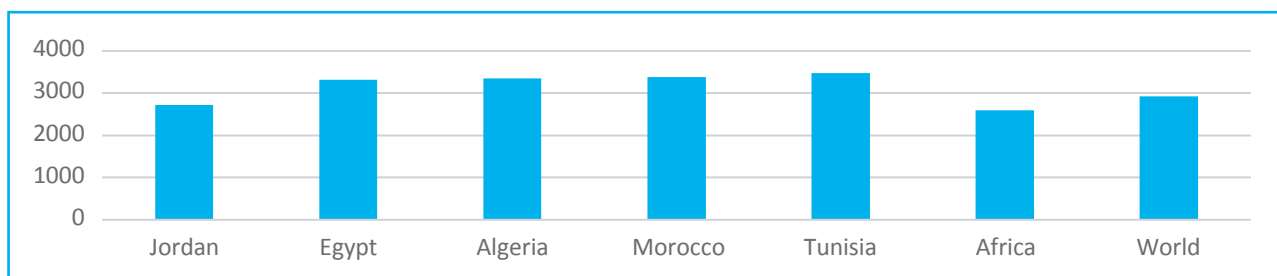
6 This indicator measures food availability per person and per day, expressed in kilocalories. It is calculated by subtracting, from the amount of food in the country, everything that is not consumed by the country's population (non-food products, exports, industrial use, animal feed, seeds, wastage and stock variation).

only indicates the average potential for each inhabitant to gain access to sufficient food, without taking into account inequalities in access to food.

On the other hand, it is important to understand the role of imports in the

countries' average food availability. We will therefore analyze, hereafter, the relative importance of food imports by studying the food trade balance, the ratio of food imports to total exports and the most imported food products, with a more specific focus on cereals.

**Figure I.3. Food availability (Kcal/person/day) in 2017**

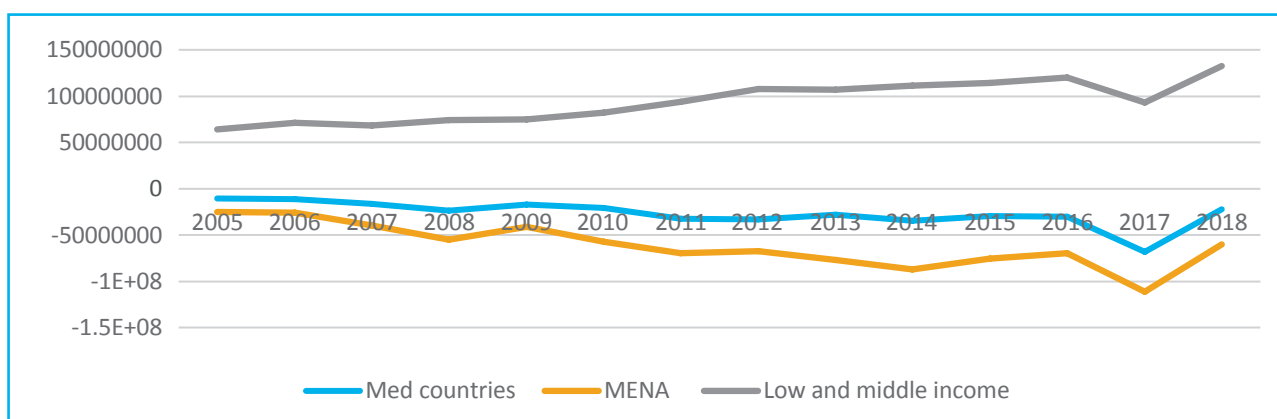


Source: FAOSTAT. Indicator not available for North Africa and middle-income countries.

For low and middle income countries as a whole, the balance of trade in foodstuffs is positive, a surplus that has moreover continued to increase since 2005. However, for the Mediterranean, and more broadly, MENA countries, this has always remained negative, following a downward trend (Figure I.4). Regarding the sample's five countries more specifically (Figure I.5),

all have recorded a negative annual balance since 2005, with the exception of Morocco where the food balance has been slightly positive for six of the last fifteen years (2005, 2006, 2015, 2017, 2018 and 2019). Tunisia has remained close to balance, without ever quite reaching it, whereas for Egypt and Algeria, the external food balance has deteriorated throughout the period.

**Figure I.4. Food trade balance\* of Med, MENA and comparable income countries (in thousands of US dollars)**

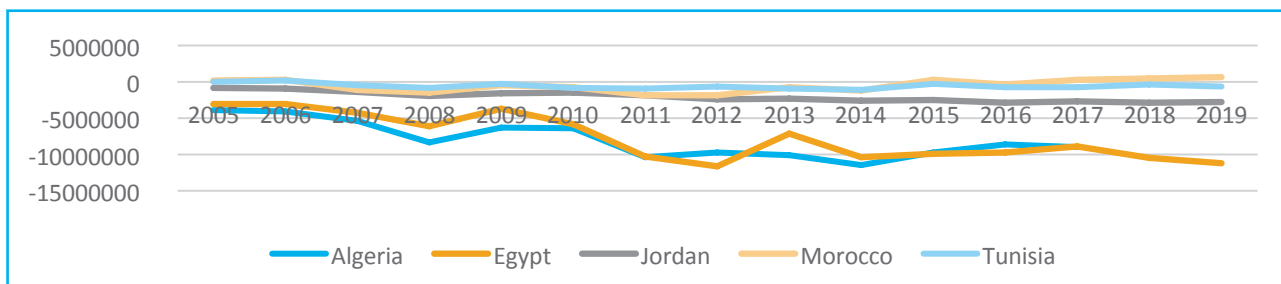


Source: UNCTAD - COMTRADE database. Calculations by the authors.

Med countries: Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine, Tunisia.

\* Exports - Imports (in value) of the "Food" product group in the SITC Rev3 nomenclature.

**Figure I.5. Food trade balance\* of countries in the region (in thousands of US dollars)**



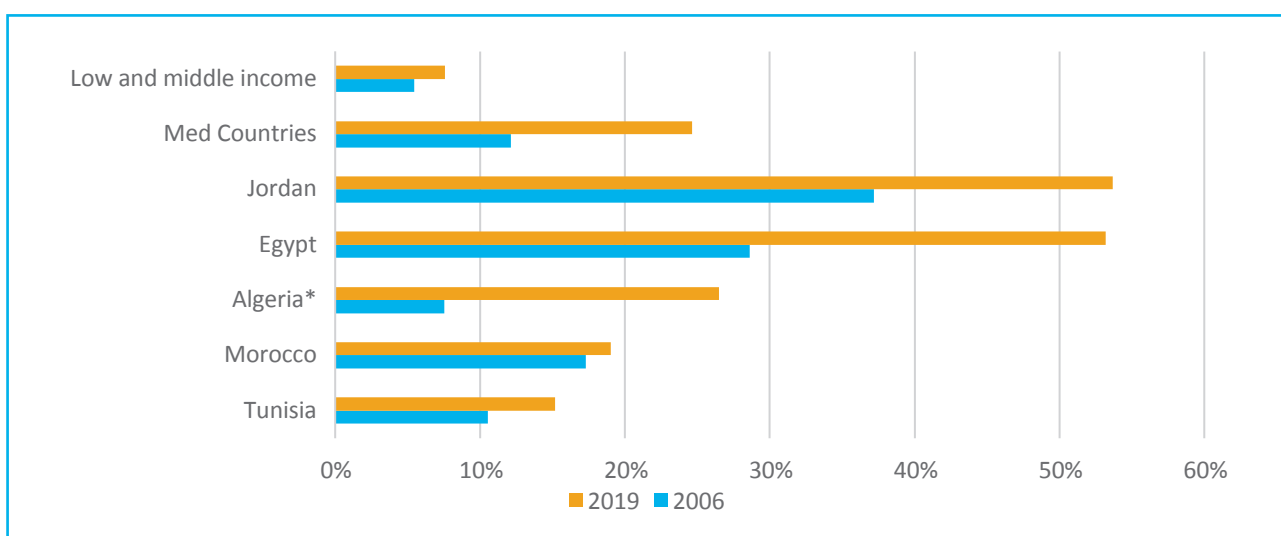
Source: UNCTAD - COMTRADE database. Calculations by the authors.

\* Exports - Imports (in value) of the “Food” product group in the SITC Rev3 nomenclature.

Another useful indicator for assessing the national dimension of food insecurity is the ratio of food imports to total exports, which measures the share of external revenues needed to cover these imports. This indicator is presented in Figure I.6. All countries in the region share a very high ratio, which has increased, in some cases significantly, over the past twelve years. This can be explained by the lack of water resources in the region, coupled with a rapidly growing population as a result of the demographic transition, which has already been largely achieved. For the Mediterranean

countries as a whole, food imports represented a quarter of export earnings in 2019, compared to 8% for comparable income countries. In 2006, this share amounted respectively to 12% and 5%. In Jordan and Egypt, food imports accounted for more than half of their total export earnings (54% in 2019 and 37% in 2006 for Jordan and 53% in 2019 and 29% in 2006 for Egypt), while in Algeria they were aligned with the average of the Mediterranean countries. They were, however, slightly lower in Morocco (19% in 2019 and 17% in 2006) and Tunisia (15% in 2019 and 11% in 2006).

**Figure I.6. Share of food imports in countries’ total exports (%)**



Source: UNCTAD - COMTRADE database. Calculations by the authors.

\* For Algeria, the latest year available is 2017.

Even more worrisome in this region is its specific dependence on the importation of essential commodities that form part of the staple diet, namely cereals (Figure I.7). With the exception of Egypt, these countries import more cereals than they produce (Figure I.8). In Jordan, imported volumes are even 30 times higher than the national production (Table I.1). More significantly, Figure I.9 shows the cereal import dependency ratio<sup>7</sup>, calculated by the Food and Agriculture Organisation of the United Nations for our five countries, the group of North African countries and the group of middle-income countries. While for middle-income countries, the dependency rate is only 3.2% with a comparative decline in the early 2000s, the dependency rate for North African countries as a whole has increased

to over 55% in recent years. Among the countries covered by this study, three have even higher dependency rates: Jordan, which imports almost all the cereals consumed in the country (98%), Algeria (76%) and Tunisia (71%). At 54%, Morocco is close to the average dependency rate for North Africa. Although Egypt has the lowest rate of the five countries, it remains very high (45%).

The nature of other essential food imports differs across countries. These are dairy products and sugar for Algeria, meat and oilseed preparations for Egypt, fruit and vegetables and meat preparations for Jordan, animal feeds, animal and vegetable oils, fats and waxes for Morocco and oilseeds, beverages and animal and vegetable oils, fats and waxes for Tunisia.

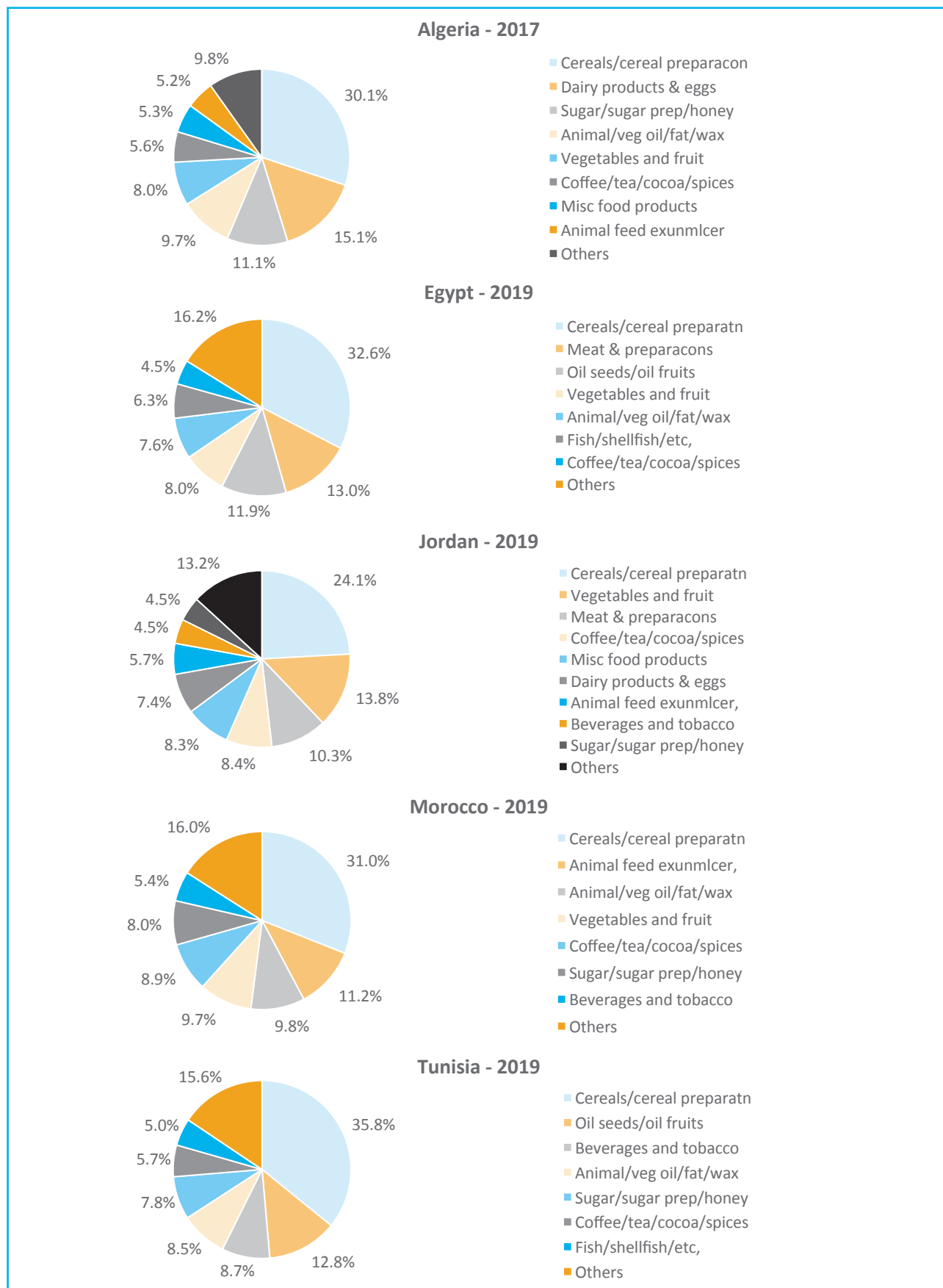
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7 The cereal import dependency ratio is calculated by the FAO as follows  $(\text{imports} - \text{exports}) / (\text{imports} - \text{exports} + \text{national production})$ . The construction of this indicator implies that:

- The lower the national production, the closer this dependency rate is to 100.
- If exports exceed imports, then the indicator is negative.

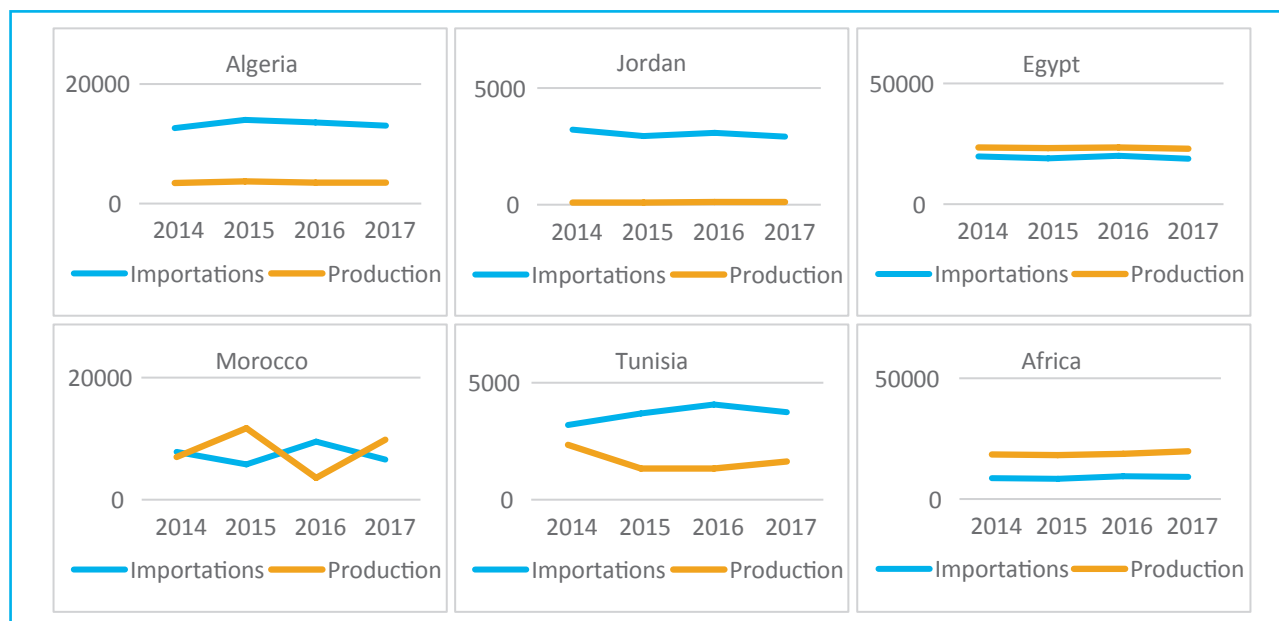


**Figure I.7. The foodstuffs most commonly imported by Mediterranean countries (Share in % of the main products in total food imports)**



Source: UNCTAD - COMTRADE database. Authors' calculations.

**Figure I.8. Quantities of cereals produced and imported by Mediterranean countries - comparison with Africa (in thousands of tons, for the years available)**



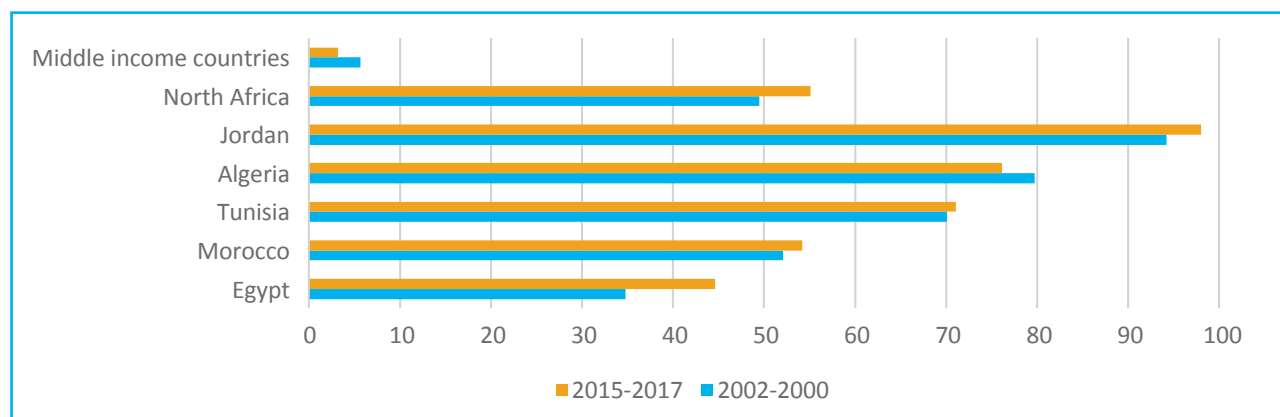
Source: FAOSTAT. Calculations by the authors.

**Table I.1. Ratio of Imports to Domestic Production (in volume, average 2014-2017)**

|         |      |
|---------|------|
| Algeria | 3,8  |
| Egypt   | 0,8  |
| Jordan  | 31,0 |
| Morocco | 0,9  |
| Tunisia | 2,2  |
| Africa  | 0,5  |

Source: FAOSTAT. Calculations by the authors.

**Figure I.9. Cereal import dependency rate\* (%) (3-year average)**



\* The level of dependency on cereal imports is equal to the following ratio:  $(\text{imports} - \text{exports}) / (\text{imports} - \text{exports} + \text{domestic production})$ .

Source: FAOSTAT.

## II.2. The individual dimension of food security: assessing access

In order to assess food security at the individual level, we relied on the set of indicators used by the Food and Agriculture Organisation of the United Nations (FAO) for the same purpose. We focused on four indicators: the prevalence of undernourishment, the percentage of underweight children, the prevalence of moderate and severe food insecurity and the prevalence of obesity. We also included data on the poverty level within these countries. All these data are prior to the Covid-19 pandemic.

We can thus see a decrease in the prevalence of undernourishment<sup>8</sup>, illustrated in Figure I.10, within all countries or groups of countries, with the exception of Jordan, the only country where it has increased over the last 14 years - due to the arrival of Syrian refugees on its soil. However, the percentage of undernourished people in the region as a whole remains lower than the average percentage in comparable income level countries (6.2% for North African countries versus 12.7% for middle-income countries).

Among the Mediterranean countries analysed in more detail, Jordan has the highest undernourishment rate and is closest to the middle-income country average at 8.5%, followed by Egypt (4.7%), Morocco (4.3%) and Algeria (2.8%). Importantly, according to these data, Tunisia has completely eradicated undernourishment among its population since 2014, despite the difficult economic context<sup>9</sup>.

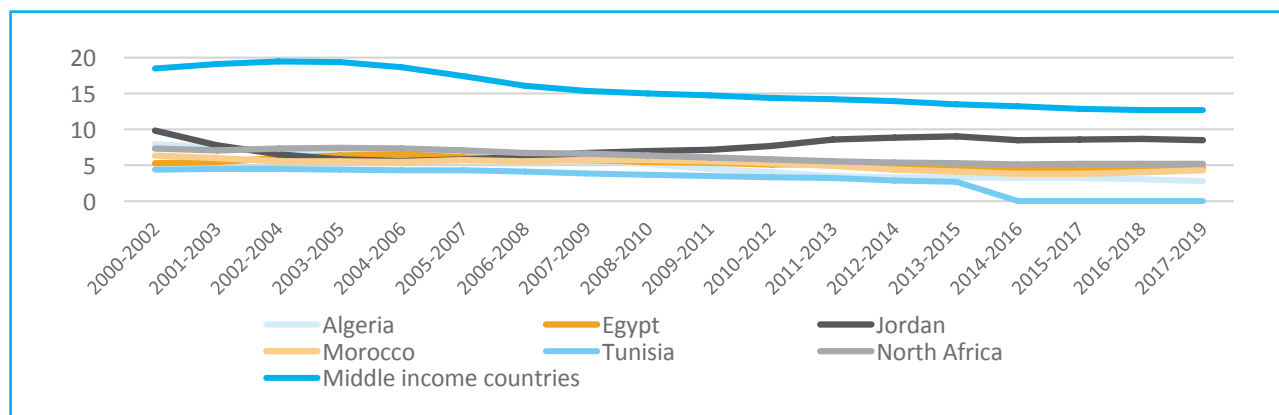
In its State of Food Security in the World (2019) report, the FAO points out that dependence on food imports is associated with an 8% increase in the prevalence of annual undernourishment. The results of this study, which covers 129 low- and middle-income countries over the period 1995-2017, might suggest that the sample's five countries have a higher proportion of undernourished people, given their very high dependence on imported food. However, although the results do highlight the increased risk of food security vulnerability, at the individual level, for countries that are highly dependent on food imports, this correlation does not yet seem to be reflected in the figures for these five countries.

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8 The prevalence of undernourishment indicates the probability that a randomly selected person in the population consumes an insufficient amount of calories to meet the minimum energy requirement of an active person (as estimated by the FAO).

9 The instability of the democratic transition has indeed affected some vital sectors such as tourism.

**Figure I.10. Prevalence of undernourishment (% of total population, 3-year average)**



Source: FAOSTAT.

When looking at the percentage of stunted children under the age of 5 within these five countries (see Figure I.11), paradoxically, it is Jordan - with a rate of 7.8% - which shows the lowest level. Although these percentages remain lower in Mediterranean countries than in middle-income countries as a whole (30%), they are far from negligible, with over 22% in Egypt, 15% in Morocco, almost 12% in Algeria and over 8% in Tunisia.

These figures should not to be taken as absolute values, but rather as indicators that allow us to compare different countries and regions. Indeed, FAO estimates of the percentage of people suffering from moderate or severe food insecurity<sup>10</sup> (Figure I.12), show that this is higher in Mediterranean countries, a fact

that is surprising given the figures on the prevalence of undernourishment in the region. This former percentage has moreover increased everywhere since 2014/2016, except in Algeria<sup>11</sup>. This increase is particularly strong in the case of Egypt, where the share of people suffering from food insecurity rose from 27.8% in 2014/2016 to 34.2% in 2017/2019. This rate exceeds the average for North African countries (28.5%), which is similar to the average for comparable income countries (32.3%). The prevalence of food insecurity in the three other countries studied here are lower than these averages, but the proportion of the population affected by this problem remains high: 17.6% for Algeria, 20% for Tunisia and 26% for Morocco. This indicator is not available for Jordan.

<sup>10</sup> The percentage of people suffering from moderate or severe food insecurity (food insecurity prevalence) is estimated on the basis of the FAO Food Security Survey. An individual classified as subject to moderate or severe insecurity when he or she has been exposed to poor quality diets over the year and has also reduced the amount of food normally consumed due to a lack of money (or other resource). It is therefore an indicator of a lack of access to food.

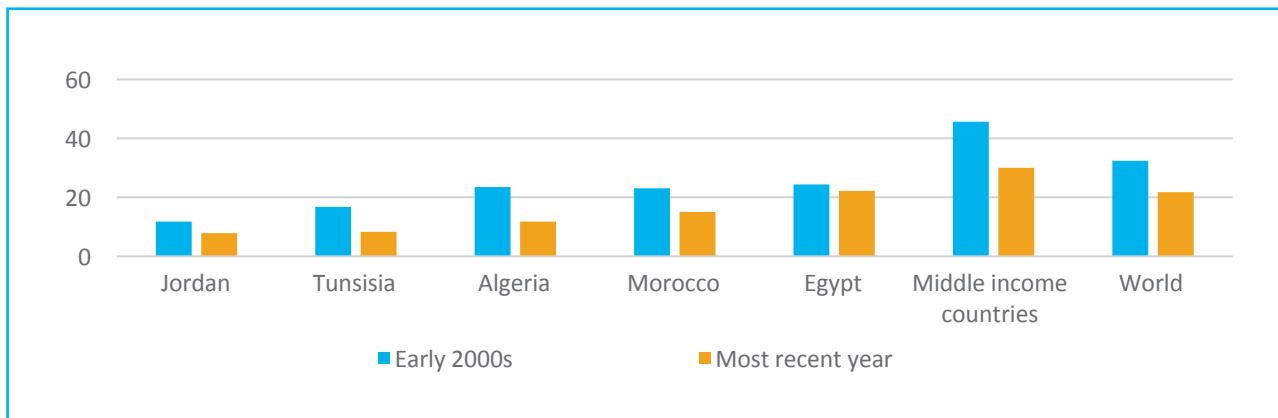
<sup>11</sup> There is no data prior to 2014 for this indicator and data for Jordan is not available.



Overall, the analysis of food security at the individual level shows that, although levels of food availability within these countries are not alarming

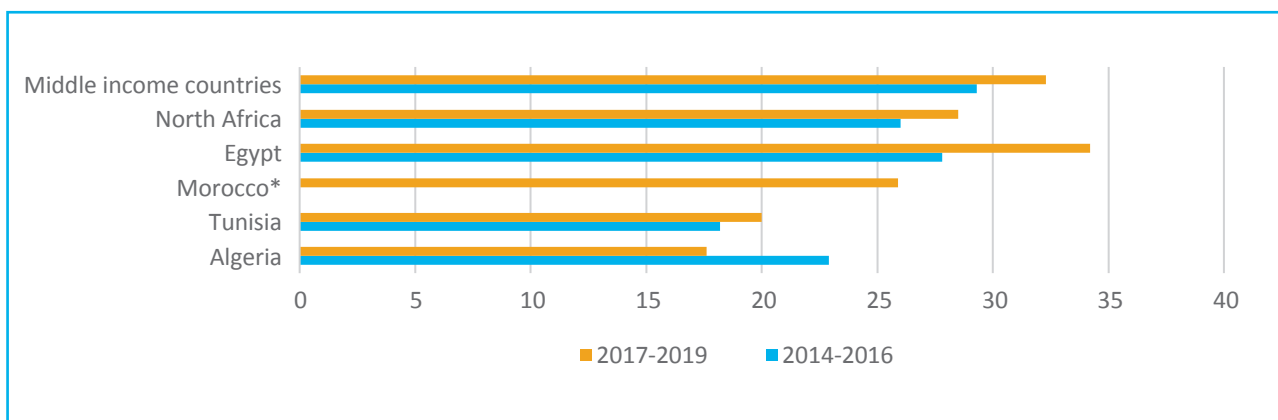
at the national level<sup>12</sup> - thanks to the significant food imports described above - there are clear problems of undernourishment.

**Figure I.11. Percentage of children under 5 presenting stunted growth (%)**



Source: FAOSTAT (Data not available for all North African countries).

**Figure I.12. Prevalence of moderate or severe food insecurity (% of total population, 3-year average)**



\* Data for Morocco are only available from 2017. Data are not available for Jordan.

Source: FAOSTAT.

It is interesting to note that this food insecurity in the Mediterranean region is accompanied by a very high rate of obesity. Figure I.13 shows that the

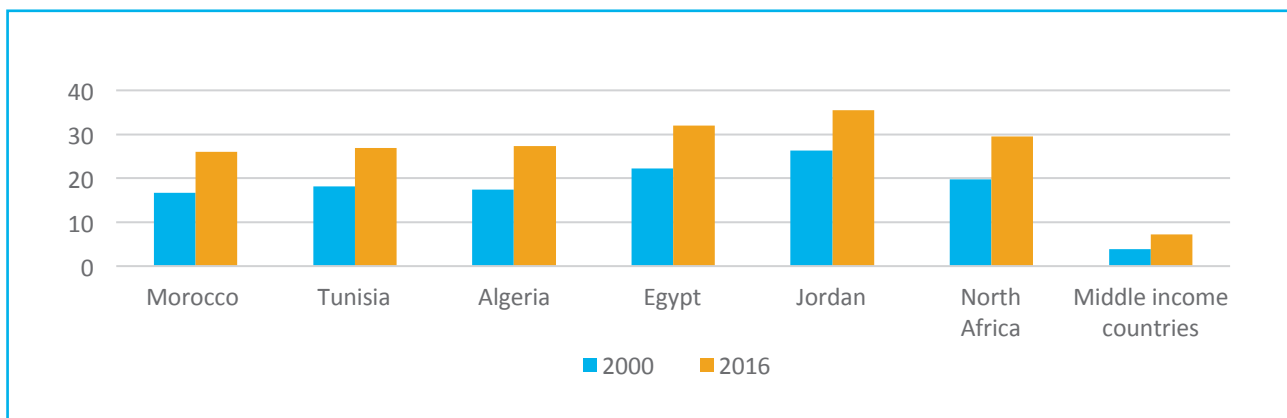
percentage of obese adults has increased in North African countries by almost 10 percentage points over the past 15 years, from 19.8% in 2000 to 29.5% in

12 As already mentioned, due to conflict, their political instability and/or/economic crises, Syria, Libya, Palestine and, more recently, Lebanon have been in the throes of a far more problematic food crisis. Libya, whose difficulties are exacerbated by the presence of refugees, is classified by the FAO as a country suffering from severe food insecurity. Syria and Lebanon (since July 2020) are among the countries with an exceptional food supply deficit (FAO, 2020). In Lebanon, the explosion that occurred in August 2020 in the port of Beirut, which destroyed the main cereal silo, has aggravated an already difficult food situation in a context of financial and economic crisis, to which is added the influx of a very large number of refugees in recent years.

2016, whereas in comparable income countries, although the proportion of obese people has also increased, it remained limited to 7.2% in 2016. The MENA region has one of the highest prevalences of obesity in the world (ESCWA and FAO, 2017). Paradoxically, at first glance, the two countries most affected in North Africa by child undernourishment or malnutrition, or by food insecurity, have the highest percentage of obesity: Jordan and Egypt exceed the regional average with 35.5% and 32% respectively.

Algeria, Morocco and Tunisia have about the same share of obese adults in their population, with between 26% and 27%. This concomitance between food insecurity and obesity among the population suggests a problem of dietary balance and nutritional quality related to the products consumed in Mediterranean countries. Moreover, wheat consumption per capita is double the world average (ESCWA and FAO, 2017). Similarly, the consumption of sugar, meat and processed foods is very high.

**Figure I.13. Prevalence of obesity in adults (% of total population, 3-year average)**



Source: FAOSTAT.

For a more complete picture of food security in these countries, analyzing the individual dimension must take into account the incidence of poverty in these countries. Whether we consider multidimensional indicators<sup>13</sup> (Figures I.14 and I.15) or only the standard of living (Figures I.16 and I.17), countries in the region

had, prior to the Covid-19 pandemic, relatively low poverty rates compared to the rest of the world. Extreme poverty (less than \$1.90 per day)<sup>14</sup>, affected more than 9% of the world's population in 2017 and up to 17% of people in lower-middle income countries (in 2014), while it affected only 3.8% of Egyptians (in 2017),

13 This multidimensional poverty index is estimated by the Oxford Poverty and Human Development Initiative (OPHI). It incorporates ten indicators associated with three dimensions of poverty (education, health and living standards). For more details, see <https://ophi.org.uk/multidimensional-poverty-index/>

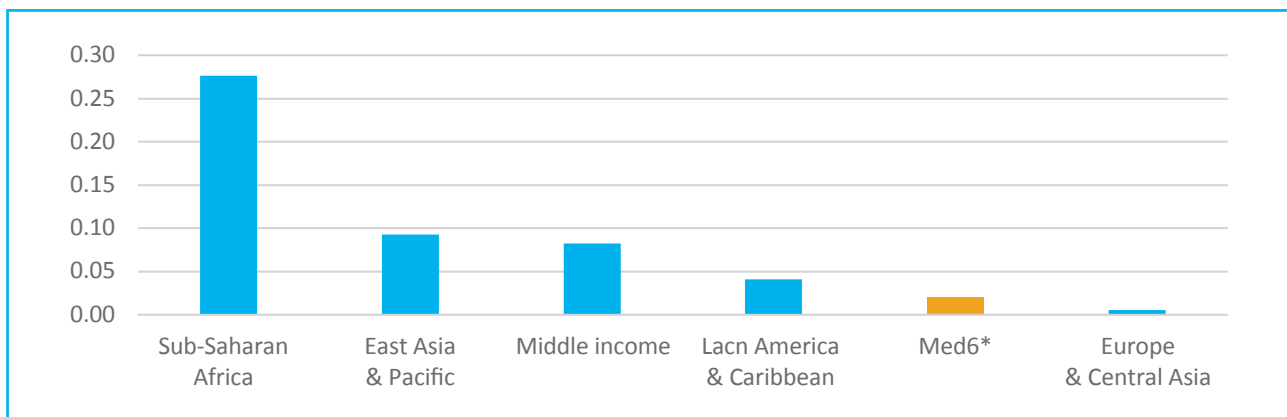
14 The poverty rates shown here are calculated at the identical international threshold of €1.90 per day (taking into account the purchasing power parity of the countries). Poverty rates calculated according to national thresholds are higher: 32.5% in Egypt in 2018, 26% in Lebanon in 2012, 15% in Tunisia in 2015, 14.4% in Jordan in 2010, 9M in Morocco in 2007 and 5% in Algeria in 2011.

0.9% of Moroccans (in 2013), 0.4% of Algerians (in 2011), 0.2% of Tunisians (in 2015), and 0.1% of Jordanians (in 2010). Apart from Egypt, our countries of interest have rates that are even lower than the average for upper middle-income countries (1.6% in 2018). Moreover, there has been a significant drop in extreme poverty over the last two decades throughout, with the exception of Egypt where the decline was limited to 1.4 percentage points<sup>15</sup>.

The coexistence of relatively low extreme rates of poverty<sup>16</sup> and situations of malnutrition can be explained by the high thresholds used to measure the incidence of poverty, indicating that people in the region are in fact highly vulnerable to extreme poverty. Indeed, although this level

is relatively low, the proportion of people living on less than \$3.2 a day or less than \$5.5 a day, is very high, and close to the rates of other comparable income countries (Figure I.17): with almost 73% of people living on less than \$5.5 a day, Egypt is almost at the same level as the average rate for lower middle-income countries (76%). In Algeria and Morocco, around 30% of the population live below this threshold, which is above the average rate for upper middle-income countries (21%). Only Jordan and Tunisia, both with a rate of 17.5%, show a slightly lower level. Another argument put forward by IFRI (2012), to add to these results, could be that poverty and inequality within these countries are higher than suggested by the official data.

**Figure I.14. Multidimensional poverty index by region (most recent years)**



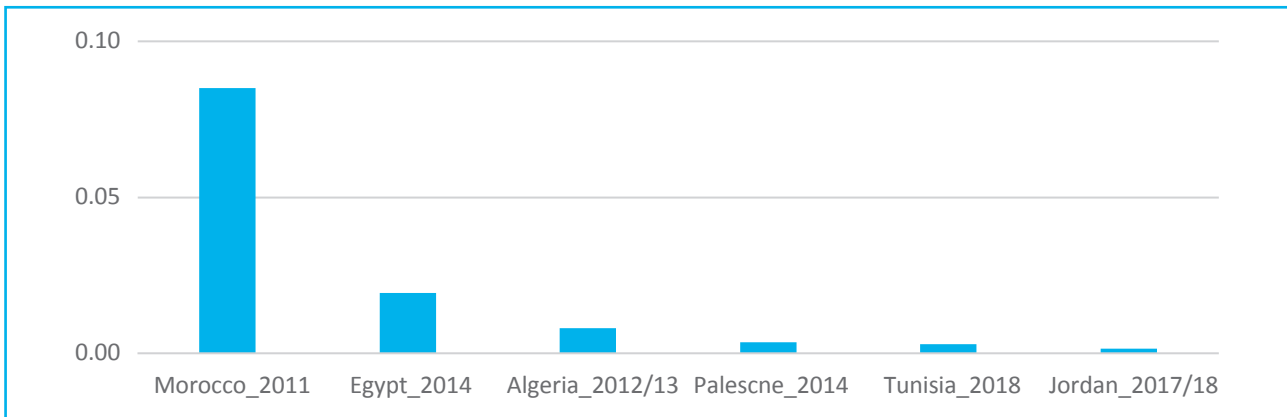
Source: *Global MPI Data (OPHI)*.

\* *Med6: Algeria, Egypt, Jordan, Morocco, Palestine, Tunisia (Lebanon is not available).*

15 This increase in the poverty rate in Egypt is more pronounced when the national threshold is used. The proportion of the population living below the poverty threshold in Egypt increased from 16.7% in 1999 to 27.8% in 2015 and, as already mentioned, to 32.5% in 2018.

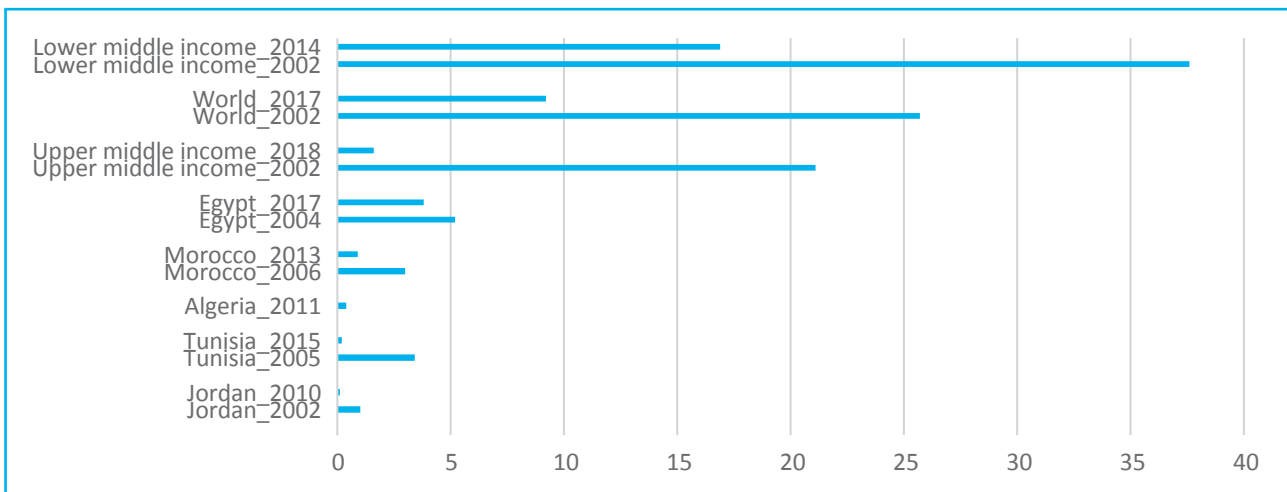
16 Again, the poverty situations in Lebanon, Libya, Palestine and Syria are very different. Poverty levels in Lebanon, assessed according to national thresholds, were 29% in 2017 (the last year available before the Covid-19 crisis). For Syria, this rate was about 35% before the war and 50% before the pandemic. There is no data available on poverty rates in Libya prior to the Covid-19 crisis.

**Figure I.15. Multidimensional poverty index by country (for the most recent years)**



Source: Global MPI Data (OPHI).

**Figure I.16. Trends in extreme poverty (proportion of the poor population living on less than \$1.90 per day, 2011 PPP)**



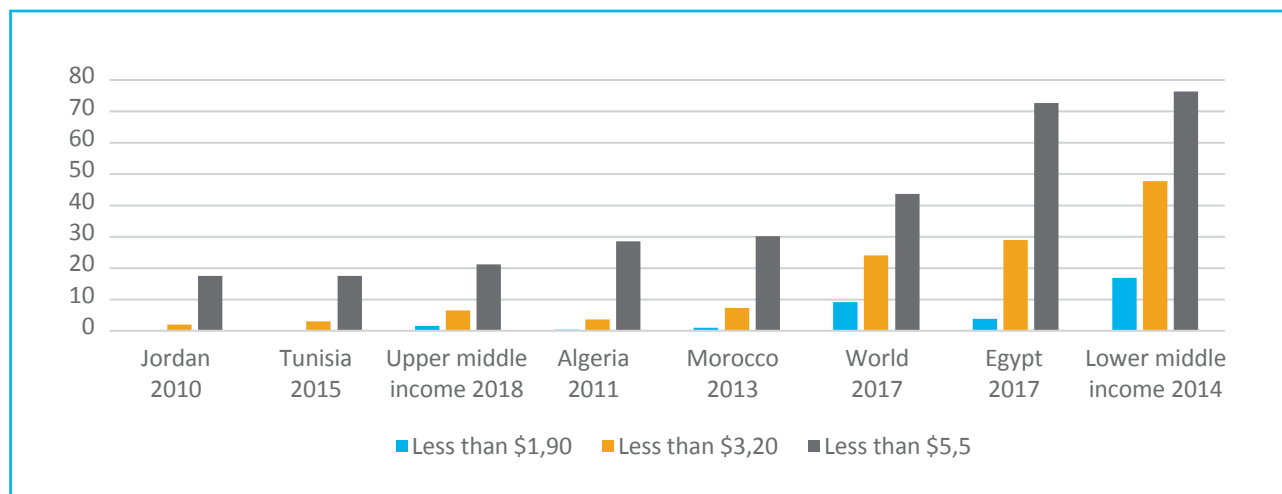
Source: WDI 2020, World Bank.

Data on poverty are not available for all middle-income countries. They appear in the WDI database only when a distinction is made between upper-middle and lower-middle income countries. It should be noted

that according to the World Bank’s classification, Algeria, Egypt, Morocco and Tunisia belong to the lower bracket of middle-income countries, and Jordan, according to the same category, is in the upper bracket.



**Figure I.17. Share of the poor population as a percentage of the total population according to international poverty thresholds of \$1.90, \$3.20 and \$5.50 per day (2011 PPP) for the most recent year**



Source: WDI 2020, World Bank.

To conclude this section on the situation in Mediterranean countries, we may note that IFRI proposed an evaluation of food insecurity that combines both national and individual calculations (IFRI, 2011), according to which the countries are classified into five categories: low food insecurity, moderate food insecurity, serious food insecurity, alarming food insecurity and extremely alarming food insecurity. We can observe that the pre-Covid-19 fragility of our countries, highlighted in our analysis, is entirely consistent with IFRI results: Algeria, Egypt, Jordan and Morocco were considered to be in the serious food insecurity category in 2011. Only Tunisia was classified in the moderate food insecurity category.

### **II.3. The risks of weakening food security in the countries of the region due to Covid-19**

The economic and social crisis linked to Covid-19 poses multiple risks to

food security in low and middle income countries. In the specific case of the five countries under review, these risks reside in two dimensions:

Firstly, regarding the individual dimension: In all regions of the South, we can expect to see a considerable increase in poverty. We found that people's vulnerability was particularly high in these countries, suggesting that a very high proportion of people could be pushed into extreme poverty by any adverse event. Indeed, the Covid-19 epidemic is an economic shock of unprecedented proportions. Poverty will therefore affect a large part of Mediterranean's population, making it much more difficult for millions of people to gain access to food. Our view is supported by a study by Summer et al (2020) which estimates that poverty rates in MENA countries could return to 1990 levels, i.e. those of thirty years ago. These authors estimate that among the new poor who will fall below the

\$5.50 a day threshold worldwide, 10% will be in the MENA region. The figures announced by the World Bank point in the same direction: the number of poor people in the MENA region is estimated to have risen from 12 million to 15 million (still at the \$5.5 a day threshold) in 2020 alone and could reach 23 million by the end of 2021<sup>17</sup>. Estimates of the impact of Covid-19 are not yet available for all countries: preliminary estimates indicate that poverty rates are currently around 20% in Morocco and Tunisia<sup>18</sup>. Preliminary results of telephone surveys conducted by the World Bank in several MENA countries, and presented in a recent report (World Bank, 2020), point in the same direction: the pandemic has eroded the purchasing power of the population as a whole, but even more so for the poorest households. In Tunisia, for example, on average 19% of households consume smaller amounts of preferred foods and 18% eat less overall. Households in the poorest wealth quintile are about five times more likely to have reduced their food consumption than those in the highest quintile. Among the poorest, about one in three households have reduced their food consumption. In the top quintile, by contrast, the ratio is

one in 16 households. Many of these poorest households are self-employed or work in the informal sector.

We may therefore expect to see an increase in malnutrition and a decrease in food quality for the populations within the five countries under review<sup>19</sup>.

Secondly, regarding the national dimension: We have seen above that food imports represent on average, for all Mediterranean countries, a quarter of export earnings and even more than half for Egypt and Jordan. However, the Covid-19 crisis has reduced not only the exports from these countries<sup>20</sup>, but also foreign exchange revenues from tourism, migrant remittances and foreign direct investment. These effects of the pandemic therefore significantly reduce the foreign exchange available to pay for food imports, which could undermine domestic food availability. This national risk might also be aggravated by other risks. With Covid-19, there has been a disruption in supply chains, both for products coming from outside (e.g. operation of quarantines, maritime transport) and for domestic products (harvesting, logistics, etc.). The fact that the agricultural sector often relies upon informal employment, meaning

17 <https://www.banquemonddiale.org/fr/region/mena/overview>

18 In Lebanon, according to the Ministry of Finance, approximately 45% of the population was living in poverty in April 2020, with 22% in extreme poverty (FAO, Sept 2020). As the economic crisis deepens and is exacerbated by the pandemic, these figures are expected to rise further. In Gaza, the poverty rate is estimated to be 90%. unprecedented levels of hunger and poverty: as a result of the pandemic, 83% of people are currently living below the poverty threshold. In Libya, the total number of people in need of food aid in 2020 was estimated at 0.34 million, with refugees and IDPs being among the most vulnerable populations. This number is expected to increase further.

19 Lower incomes lead people to considerably reduce their consumption of nutritious products (fruit and vegetables, meat, fish, etc.).

20 This drop in exports is aggravated in Algeria by the drop in oil prices.

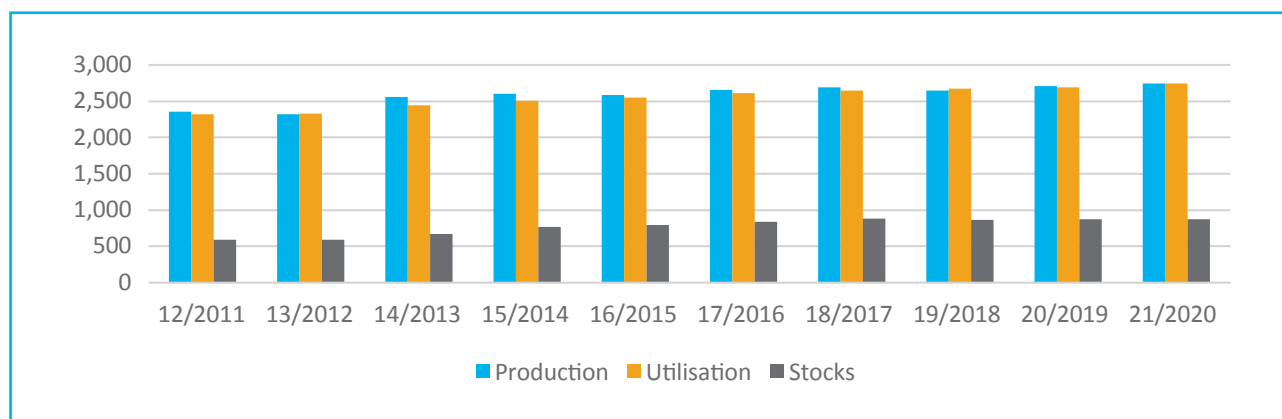
that it is impossible to deliver work certificates, has prevented work from being carried out in the fields during the lockdown<sup>21</sup>. But, above all, as the countries of this zone are heavily dependent on food imports, there is the fear of price shocks on international markets, like those that occurred in 2007-2008 and again in 2010-2011. So far, however, the pandemic crisis has not led to food inflation.

It is true that at the beginning of the crisis, food exporting countries, particularly those exporting cereals, considered withholding part of their production, with the risk of a surge in prices. This was the case for Russia, which once again became the world's largest wheat exporter in 2015, a position it had held in 1914 before disappearing from international markets for almost a century. This was also the case for Romania, Europe's second largest wheat supplier, which considered suspending its exports

outside the EU. Similarly, in Central Asia, Kazakhstan and Ukraine have not only considered restrictions, but both countries enforced them up until May 2020. However, this risk of exports drying up has receded since the first weeks of the pandemic crisis.

In the region, certain countries hesitated in the same direction. For example, at the end of March 2019, Egypt suspended its lentil and bean exports for three months to address possible supply chain disruptions in the country. Since the beginning of the crisis, little tension has been observed in international markets. Not only have the threats of restrictions faded, but current harvests are relatively good worldwide and stocks are high, unlike in 2007-2008 and 2010-2011. According to the FAO, by the end of 2020 the cereal stock-to-use ratio was expected to be comfortable at around 31%, which is a relatively high level by historical standards (see Figure I.18).

**Figure I.18. World grain production, use and stocks from 2011/2012 to 2020/2021**



Source: Annual FAO Food Price Indices (2014-2016=100) FAOSTAT.

21 This is particularly true for Jordan (Raouf et Elsabbagh, 2020). Mariam Raouf, Dalia Elsabbagh, Impact of COVID-19 on the Jordanian economy, food systems, and households, IFPRI, novembre 2020.

### III. Ways to improve food security

#### III.1. Producing more by producing better

Although price shocks seem to have been mostly avoided so far, they could recur in the future beyond the current pandemic crisis. In particular, due to the context of climate change which is affecting the Mediterranean more than the rest of the world. The climate change is all the more damaging in this region as it is among the most exposed to a lack of arable land and water resources. The IPCC (the Intergovernmental Panel on Climate Change) considers the region to be a climate change hot spot in which certain countries are highly affected.

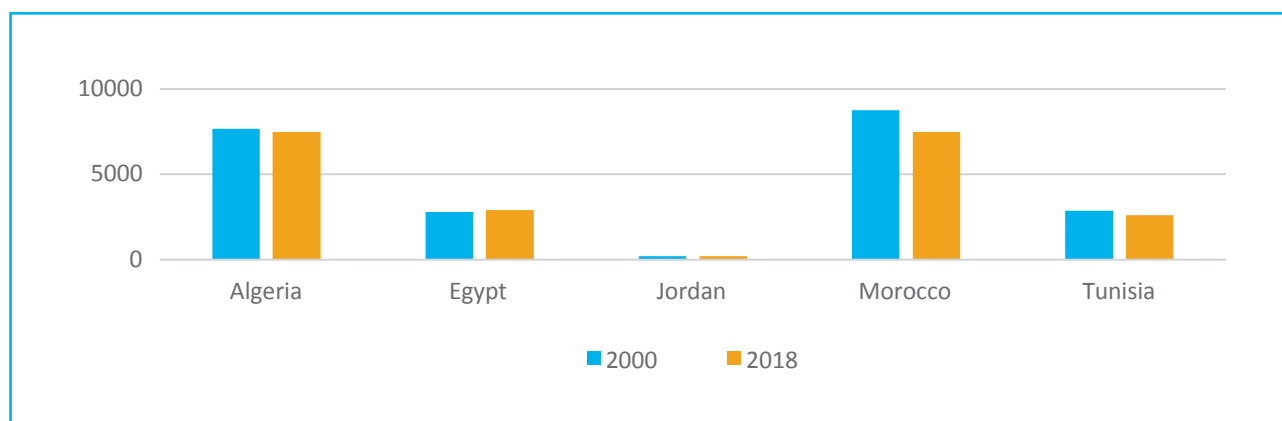
North African countries and Jordan are particularly exposed to climate change, with rainfall that is ever more erratic and expected to decrease over the long term, and rising temperatures giving rise to greater evaporation of dam water reserves and an increasing need for irrigation. The risk of water scarcity in Egypt, which already receives very little rainfall, is mainly linked to developments in the Ethiopian Nile water tower, while the possible effects of climate change on the Ethiopian high mountains remain unclear. The construction of the Renaissance Dam on the Blue Nile, the main tributary of the Egyptian Nile, however, is almost certain to affect downstream water supplies.

Rounds of African Union-sponsored talks to resolve the decade-long dispute around filling and operation between Egypt, Ethiopia, Sudan came to a freeze in April. To manage repercussions, Egypt is currently prioritising the rationalisation of water, lining canals, and recycling wastewater to meet the nation's water needs. In addition, Egypt faces possible issues stemming from the rising level of the Mediterranean Sea, linked to the melting of glaciers, and the subsequent potential salinization of arable land in the agricultural basin.

Beyond these agro-climatic and geopolitical constraints, food security partially relies upon improving national production. Increased production can improve availability, and if this increase were not to be left solely in the hands of a few agro-investors but were to rely on the many, and often poor, small-scale farmers, access to food would also be improved. When it comes to increasing production, the question of expanding the surface area dedicated to agriculture immediately arises. However, before this can be envisaged, an expansion of cities would be needed, which is often easier said than done, as urban sprawl has been driven by demographic expansion, which is still very much ongoing, particularly in Egypt. It should be noted that since the beginning of the century, the trend has rather been towards the shrinking of arable land, sometimes very significantly, as in Morocco. Only Egypt has succeeded in increasing the amount of arable land since the year 2000 (Figure I.19).



Figure I.19. Evolution of arable land (comparison between 2000 and 2018)



Source: FAOSTAT.

However, there seems to be a growing awareness of this urgent topic. Morocco has just set up a land mapping system in the agricultural region of Souss-Massa, in the south, which distinguishes three categories of land according to their pedological properties: land with high agricultural potential to be protected, land with medium agricultural potential to be safeguarded and finally land with low agricultural potential to be developed. More generally, land use plans, where they exist, must be more thoroughly enforced. This refers in particular to the issue of corruption, where land deemed to be arable may be given over to real estate usage

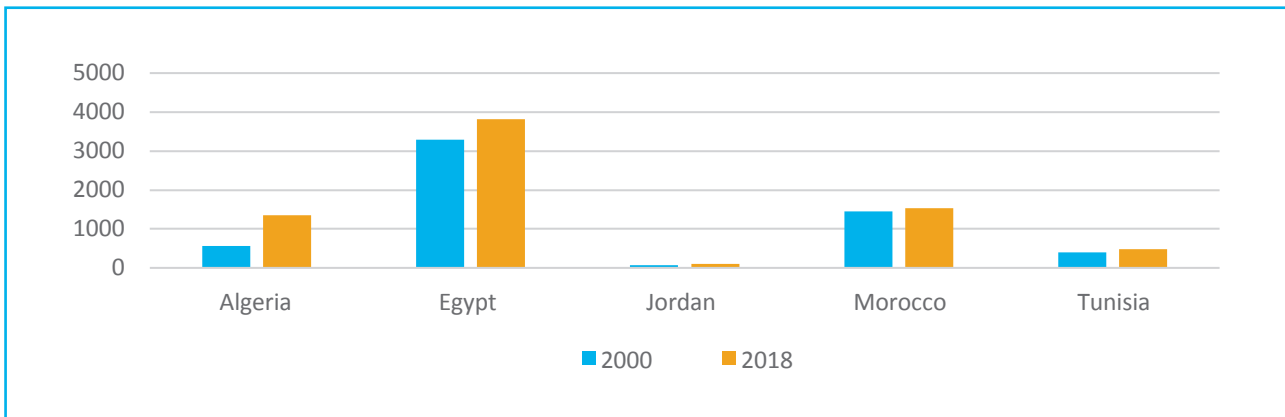
following questionable transactions. A number of cases have recently come to light in Algeria, while trials on these issues were brought to court in Tunisia and Egypt, in the wake of the revolution<sup>22</sup>.

While traditional farming land is sometimes seen to be shrinking due to the pressure of urban sprawl<sup>23</sup>, the expansion of agricultural land remains a very active option, but always conditioned by access to water, as irrigation has a major impact on productivity. There has been little increase in the area of irrigated land over the past 18 years, except in Algeria and Egypt (Figure I.20).

22 On Algeria, one can read, in particular, Omar Bessaoud's article published in 2019, *Economie politique du pillage du foncier agricole*, *Le Soir d'Algérie*, 19 juin 2019. For Tunisia, one may refer to Mathilde Fautras' thesis, "La terre entre racines, épargnes et spéculations. Appropriations foncières et recompositions de l'espace rurale à Regueb (Tunisie)", Thesis in geography from the University of Paris Ouest Nanterre La Défense, 2016.

23 See for example for the case of Egypt, Billion and Parant, 2020. It should be noted, however, that Egypt is the country that has expanded its agricultural area the most, with an increase of 40% between 1963 and 2007 (Faostat).

**Figure I.20. Evolution of areas equipped with irrigation systems (comparison between 2000 and 2018)**



Source: FAOSTAT.

This quest for irrigable land is particularly important in desert areas. In Algeria, in the midst of the Covid-19 crisis, a national office for Saharan agriculture was established on 3 May 2020, with a long term objective to enhance one million hectares. In Egypt, the policy of reclamation of desert lands has been at the heart of political agendas since the Nasserite era; it was renewed in 2015 with the launch of a land reclamation mega-project (600,000 hectares). Financed as part of the country's recovery plan, this project is intended to enable private investors to acquire agricultural land, mainly reclaimed from desert areas on the fringes of the Nile delta and in the south. Unlike the more traditional and fragmented farms of the delta and Upper Egypt, these farms, which are generally dedicated to high value-added crops (market gardening, fruit and vegetables exported to Europe), cover several hundred hectares and have a high level of mechanization. However, this type of project does not always have a direct impact on food security, as these products may be intended for export. Moreover, despite

the political announcements, the reality is often quite different, as the cultivation of rangeland or desert land requires large investments in water supply and irrigation infrastructures, as rain-fed agriculture in these areas is reputed to be difficult or even impossible. In addition, the soils are often poor.

Jordan has also engaged in the valuing of new lands especially in the Highlands, to the northwest, and in the Disi region, to the south. But more or less all of these projects come up against the harsh reality of water resources. In this country, where the ecumene is highly concentrated in the north-east, the aquifers are under such pressure that they are all being depleted. As a result, it is very difficult to pursue the expansion of agriculture. As for the south, in Disi, even though less populated, the groundwater has been pumped since 2013 to supply the northern cities, notably Amman. This jeopardizes the development of irrigation in this southernmost area of the country. The situation has been exacerbated

by the influx of Syrian refugees, which has increased the domestic use of water to the detriment of irrigated agriculture<sup>24</sup>. The extra water carried from Disi to Amman has, indeed, been taken up by the increasing population of refugees.<sup>25</sup>

In the Maghreb, land expansion is also burdened by a water crisis already underway due to climate change and competing uses. In recent years, the three Maghreb countries have experienced tension around water. In 2013, incidents occurred in Setif in Algeria, but also in Tunisia, in the region of Sidi Bouzid, due to the development of a very water-intensive agricultural model. In 2016, the Tunisian Water Observatory issued a warning about possible future thirst riots. In 2017, small incidents broke out in the Drâa region of Morocco, which suffers from a lack of water, where the alleged culprits were watermelon farmers. Certain signs of potential future crises are therefore apparent. A recent study by the United Nations Economic Commission for Europe (UNECE), published in September 2020, shows that the largest groundwater reserve in North Africa - the Northern Sahara Aquifer System (NSSA) shared by Algeria, Libya and Tunisia - is at risk.

Finally, in Egypt, the greening of the desert is also subject to water

constraints. The Nile may offer opportunities, once a resolution to the GERD dispute is reached. With regard to the expansion of agricultural areas in the Libyan desert oases west of the Nile, projects launched in the 1960s are no longer in progress, as the quality of the water extracted from the subsoil is not very good and the soil is poor.

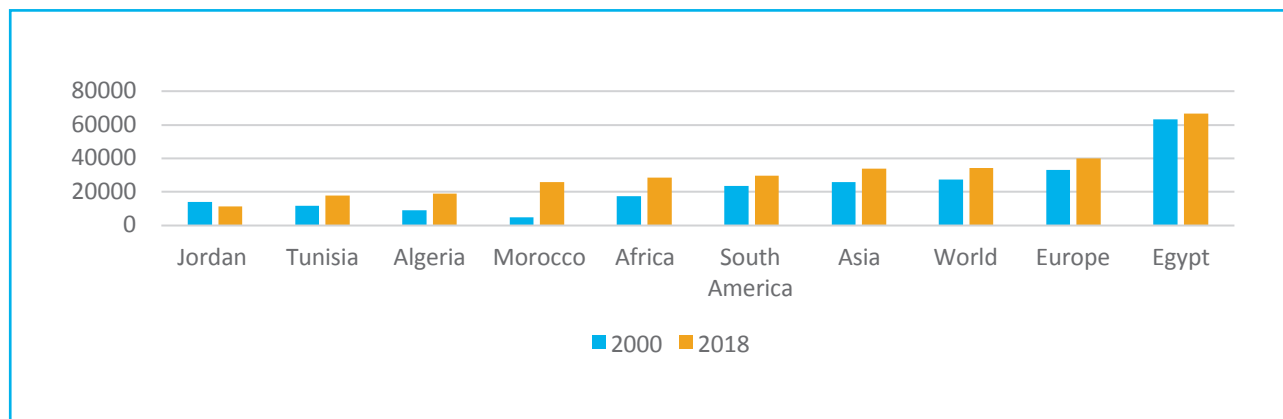
Given the pressures on water resources, the possibility to extend irrigated land is therefore limited in the SMECs. In any case, irrigated land must operate with limited water supplies, which means that the water must be used more efficiently. This raises the question of water productivity, in other words, it is important to develop agricultural policies to encourage the farming of crops that offer a good ratio between added value and m<sup>3</sup> of water used. But above all, an effort must be made to improve productivity in both the rainfed and irrigated sectors. There is plenty of room for improvement in the countries under review, particularly technological improvements, starting with digitalisation. As shown in Figure I.21, agricultural yields of wheat are lower than the average for African, South American and Asian countries, except for Egypt, which is unique as they grow two crops per year on the same plot.

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24 However, these refugees can also offer opportunities to Jordan, especially as agricultural labourers.

25 Testimonials collected in April 2018, Pierre Blanc.

**Figure I.21. Evolution of wheat yields (comparison between 2000 and 2018, in hg/ha)**



Source: FAOSTAT.

Hence, the problems to be solved are related to agricultural development. Of course, technical and economic solutions such as easier access to credit and inputs, technical support, agricultural training, securing land, development of agricultural research, agrarian extension, and professional organizations<sup>26</sup> need to be implemented and/or strengthened and/or improved. Up until now, these solutions, even those contained in ambitious programs such as the PNDA in Algeria at the beginning of the century and the recent Green Morocco Plan completed in 2020, have neither led to a significant increase agricultural production, nor solved the problem of poverty among workers in this sector thanks to improved productivity<sup>27</sup>. Even beyond these economic and technical measures, which should not be overlooked, we

believe it is even more important to insist, firstly, on the model of agriculture to be promoted and, secondly, on establishing the right conditions for the successful implementation and support of these programs, which determine their success. This dual emphasis on models and conditions for development, are an addition to be brought to the many reports on food security in the countries of the region, which make little mention of them.

Given the requirements in terms of food security (due to population growth) and the environment (climate change, pressure on resources), the key question is which agricultural model to support. Although the green revolution of the 1960s greatly increased productivity with the help of technological packages (selected seeds, pesticides, fertilizers, irrigation), it showed its limits in

26 On this topic, the index of public expenditure on agricultural research compared to agricultural GDP clearly illustrated that Arab countries were far below the 2.36% invested by developed countries. In fact, while the number of researchers is relatively high in Arab countries, the average funding per researcher is low.

27 The agro-economist Naji Akesbi, for example, has a particularly critical view of the Green Plan programme (see Green Morocco Plan: Najib Akesbi's alarming assessment <https://www.youtube.com/watch?v=ZjKYw2pj1sw>). Regarding the evaluation of the Green Plan, we may also cite a FEMISE report (2013) coordinated by L. Oulhaj, which highlights the limitations of this program.



environmental (pollution, lowering of water tables) and economic (debt) terms. In the light of this observation, in the early 1990s, the agronomist Michel Griffon advocated the doubly green revolution, whose ambition was to increase production without reducing environmental capacity and biodiversity, and to reduce poverty and food insecurity while respecting the conditions for economic and social viability and equity. This idea has gained ground, even though it is now more focused on agroecology.

In the context of the countries of the region, this type of agriculture is to be favored, as it is extremely promising in terms of productivity, while saving limited resources and contributing to the fight against climate change, which is particularly salient here. Building on the research of functionalities provided by ecosystems, agroecology seeks to make full use of nature as a production factor, while ensuring that its capacities for renewal are preserved. It is thanks to this systemic approach that technical and economic results can be maintained or reinforced while improving environmental performance, which is essential in a context as unfavorable as that of the five countries under review. Even better: as they are particularly exposed to climate change and the erosion of biodiversity, agroecology can provide these countries with a means of storing carbon in the soil<sup>28</sup>. Similarly, the re-diversification

of agricultural production systems and landscape mosaics, strengthens biodiversity, which is now considered as a production factor. With its full range of cultivation techniques (limitation of soil tillage, use of organic inputs, development of intermediate crops, maintenance of grasslands and plant cover, deployment of hedges and agroforestry), agronomy is at the heart of agro-ecological production systems. Sound knowledge in this area is essential, both for farmers and their advisors; it is therefore necessary to rethink extension and training systems and, above all, to put farmers at the center of the processes, whereas they have long been considered as mere receptacles for prescriptions from above.

This vertical approach, in contrast to a participatory process, focuses on the conditions required to support development which, in addition to the agricultural model to be favored, constitutes the second element that we would like to underscore. Until now, the gap between the technological and regulatory measures of agricultural policies in the region and their results can be partially explained by the notably vertical conditions required to set public policies in motion, which fail to involve sectoral stakeholders in the design of policies and their implementation. This top-down approach highlights the highly centralized nature of operations in the countries studied. Algeria,

28 One example is the 4 per one thousand initiative conducted on an international scale, focusing on the question of soils, which constitute the world's largest biological carbon stock, after the sea. By capturing CO<sub>2</sub> from the air through photosynthesis, a plant absorbs carbon. If this plant decomposes in the soil, it returns this carbon to the soil in the form of organic matter. The soil is then enriched with carbon and becomes more fertile. If the organic matter in agricultural soils were increased by four grams per thousand grams of CO<sub>2</sub> each year, we would be able to compensate for all the greenhouse gas emissions produced by the planet in one year.

which benefits from a dense network of local public institutions and is in a position to allocate public resources in light of its oil and gas revenues – although these have admittedly been undermined - has not yet accomplished its agricultural revolution.

This top-down approach more broadly underlines – and this is obviously related – the weakness of professional organizations. Within the different sectors, producer organisations are the least organized components. How can such a numerically important profession fail to be active in public debates and decisions? This paradox is quickly swept aside: the top-down approach, in an authoritarian context, has obviously hindered the emergence of an autonomous profession. Where they do exist, as in Algeria and Egypt, these organizations are not very representative: it has been clearly established that they are linked to a local figure or, since the implementation of a certain degree of liberalization, they often represent the interests of a group of farmers, usually the one that is in tune with the market (e.g. the agro-exporters). They are also sometimes created as part of a project to raise funds, but in this case they do not survive for long. Thus, in the end, the state finds itself in a decision-making position without being able to benefit from a structured dialogue with the other production and market players. This is because creation

of such autonomous professional organizations is often coerced by the state. In the area of agricultural development, public power therefore borders on impotence. A “forceful state” is not a “strong state”.

Yet the benefits of this professional organizations, which is hindered here for socio-political reasons, no longer needs to be demonstrated: it is useful for the transfer of information, the better sharing of added value, the qualification of human capital, etc. For example, it is known that the implementation of an irrigated area is all the more successful if the irrigation associations are involved in the project from the beginning.

This combination of a fairly omnipresent State and the weakness of professional organizations (producer organizations, irrigation associations, inter-professionals, consumer organizations) is obviously not conducive to the development of trustful relationships between public authorities and agricultural stakeholders. Whereas we are fully aware that, beyond sectoral policies, development - and not just growth – is based on the model of “trustful societies”<sup>29</sup>. In the region, due to a lack of trust, public policy measures are viewed with suspicion. In Egypt, for example, farmers sometimes prefer to sell their grain to wholesalers even if the purchase prices are lower than those offered by the state-linked Agricultural Development Bank, as the latter is

29 Du miracle en économie, Leçons au Collège de France, Alain Peyrefitte, éditions Odile Jacob, 1995. On the subject of trust, Prince Hassan of Jordan spoke in unequivocal terms in an interview on the eve of the Arab Spring: “Arab societies are lobotomized by bad governance [...]. In Arab countries where authoritarian leaders have prevailed, the concept of conversation and listening has atrophied. The Citizen’s Charter, the Social Charter [...] are genuine paths to explore.” La Croix, 22 juillet 2009.

perceived as bureaucratic and even corrupt. This lack of confidence does not facilitate the foresight necessary for investment. Moreover, this mistrust between private stakeholders, in particular between banks and farmers, leads to increased transaction costs<sup>30</sup>.

This lack of trust does not facilitate relations among different actors within the sectors. However, they must be organized to ensure agricultural success. Without trust, the balance of power between stakeholders is highly asymmetrical, particularly in the grain sector. About ten years ago, researchers studying sectors in North Africa wrote: “collective organizations of grain producers hold very little political weight in negotiations with public authorities and other stakeholders of the sector. [...] Whereas, intermediaries working in the processing and distribution sectors, in particular bakers, are far better organized and form strong pressure groups that are able to put pressure on the public authorities.”<sup>31</sup> There is, however, a glimmer of hope when we see the proliferation of organizations in Tunisia today, in the context of a democratic transition that seems to be well underway (Ben Becher, 2014). In Egypt, on the other hand, the short period during which peasant organizations appeared, starting in 2011, may have come to an end by 2014.

### III.2. Overcoming poverty

Advances in agricultural production are not only the primary driver of food security by accelerating the internal availability of food, but they also facilitate access to these resources in a context where farmers are among the poorest populations in the region<sup>32</sup>. As long as yields are improved without harming the environment, and production costs do not increase proportionately, the income of farming communities will indeed increase.

But when it comes to improving farmers' performances, it is important to target the key agricultural sub-sectors. In the region, as elsewhere in the world, a more export-oriented sub-sector has developed alongside family farming (Purseigle, Nguyen et Blanc, 2013). This contributed to the shift in the economic and food paradigm that took place in Arab countries at the end of the 20th century. Arab countries that had often relied on self-sufficiency, with a great deal of public intervention, turned to export sectors by promoting comparative advantages. Parallel to the trade liberalization initiated by a series of trade agreements, the countries of the region pursued internal liberalization, which was supposed to promote investment in agriculture. Thus, regarding the hydraulic strategy, the countries that had established public systems abandoned this approach – considered to be too rigid

30 Let us recall that according to Wallis and North (1986), the two essential vectors for growth lie in the reduction of transaction costs as well as in anticipation, i.e. the capacity to engage in forwards thinking and, therefore, to invest.

31 Dynamiques des acteurs dans les filières agricoles et agroalimentaires, AFD-CIHEAM study, 2009.

32 In 2009, 76% of the poor in Arab countries were reportedly farmers or agricultural workers (IFAD-FAO-World Bank, 2009).

– in favor of private irrigation drawing upon underground water tables, as seen in Morocco (Jouve, 2006). Concerning land, after the agrarian reforms previously implemented, Egypt engaged in a counter-reform from 1996 onwards, the aim - or at least the effect - of which was to push for a certain re-concentration of land. Even Jordan privatized land in the strategic Jordan River region in 2001. After the period of state supervision, it was time to promote private investment as the main driver for agriculture. This new conception of agricultural production led to a shift away from family farming and, even more so, from subsistence farming.

By private investors in agriculture, we mean retailers, industrialists or other private parties who also included large firms, often of foreign origin. Egypt, in particular, welcomed agricultural investment on the newly reclaimed land of the delta, on the land of the North Sinai, irrigated by the al Salam canal and on land in the Toshka region, irrigated thanks to the Aswan dam. Some of these agricultural companies are listed on the Cairo stock exchange but their fortunes vary. The Kadco company, for example, founded by the Lebanese-Saudi prince Al-Walid ben Al Talal, ran into trouble after the Tahrir revolution<sup>33</sup>.

This agricultural model, with its high degree of capital intensity, is adapted neither to the region's environmental requirements nor to the fight against rural poverty; not to mention that its orientation towards exports only

indirectly affects food security through the collection of foreign exchange. Regarding the latter, it would also be necessary to measure the real net flow of foreign exchange insofar as a very large share of production materials and inputs linked used in this agriculture are imported. However, the question here is not necessarily to oppose the more capital-intensive and often export-oriented agriculture against family farming structures, provided that regulatory policies are careful not to let the former encroach on the latter. However, the measures implemented in recent years (such as those contained in the Moroccan Green Plan<sup>34</sup>) have tended to relegate traditional agriculture to the sidelines.

In the post-Covid context, when it is urgent counter increasing poverty, the family farming sector, in particular, should benefit from increased support. This could help increase national supply while promoting biodiversity and securing access to food for an agricultural population that largely remains among the poorest in the region. We should recall that many small farmers have no access to credit and are poorly connected to markets due to a lack of infrastructure and information on prices. All of this affords opportunity for public action. Farmers need to be provided not only with means, but also with consideration and support as the stakeholders of a multifunctional sector whose contribution should be given recognition, including on the financial level.

33 Pierre Blanc, *Proche-Orient, le pouvoir, la terre et l'eau*, Paris, Presses de sciences po, 2012.

34 In the Green Plan, funding for traditional family farming accounted for only 10% of the program. In Egypt, this trend has also been demonstrated, notably by Habib Ayeb (2010). For Tunisia, we may refer to Mathilde Fautras (2014).



For example, they could be rewarded for the positive externalities of agro-ecological cultivation practices, which contribute to the fight against climate change and the erosion of biodiversity.

However, it would be futile to try to solve the problem of rural - mainly agricultural - poverty in the absence of ambitious economic policies, to which agricultural policy guidelines must be added. Can we deal with agricultural issues without considering them in relation to industrial policies? Regarding the latter, the agri-food industry sector, which grows the value of agricultural production but remains too atomized in North Africa and Jordan, offers plenty of room for improvement. The processing of agricultural products is a challenge for the future both in terms of added value and the fight against poverty, through the jobs it generates.

More generally, poverty among farmers and the rural population as a whole could certainly be mitigated through a greater concentration of small-scale farming land to reduce the fragmentation of production structures that reduces their economic capacity. But this might deprive certain smallholders of their livelihood and would therefore be counterproductive in the effort to alleviate poverty<sup>35</sup>. The issue of land concentration raises the question of the alternatives to be offered to those who are forced to vacate their land in a region where the economy is struggling, particularly

in Egypt and Tunisia. This of course refers to the main economic and social policy guidelines of the five countries and more specifically to the rural development policies, which must be ambitious and massive in order to create professional opportunities, and not only in agriculture. This also leads to a reflection on possible honorable reclassification policies for the many older farmers, which could thus free up part of the land stock for younger farmers.

In fact, we cannot afford to wait for a “demographic shift” to be boosted by a massive relay from other economic sectors, but should take immediate action to place the very large number of small-scale farmers at the heart of public policies to give them access to credit, the market, training, land security and infrastructure. The market access gap between small and medium-sized producers and large production units must be closed. It goes without saying that the development of the farming community can simultaneously stimulate the development of a rural economy (small-scale industry, services, etc.), which would in turn call upon part of the agricultural labor force, thus increasing the size of the farms. But on this last point, land policies must be aligned to allow some land mobility. There is also a need for rural infrastructure and local development policies that can accompany the revitalization of rural areas. This orientation of agricultural and rural development policies does

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35 It is truly difficult to accurately qualify the different farming structures in North Africa and Jordan. The terms small-scale farming can refer to survival farming and family farming. But when we talk about small-scale farming it is also difficult to specify the size of the farm. Additional research work is required to clarify the subject and understand the situation.



not boil down to a social treatment of small-scale farming that aims to keep families in place for lack of other work opportunities. In this case, it is a question of giving the necessary means to small and medium-sized farmers to make them truly productive and the driving force of agricultural development.

Although farmers are among the most impoverished and exposed to food insecurity, they are not the only poor populations in the countries of the region. The question therefore arises as to how we may reduce the exposure of these populations. There are, of course, short-term responses, in particular consumer subsidies. If food prices rise, poor families face two risks: the budgetary risk, which consists in the eviction of other expenses, in particular medical and educational care, and the dietary risk, which consists in favoring calorie intake over nutritional diversification (with the dual phenomenon of malnutrition and simultaneous overnutrition). In view of these risks, the question arises as to how to improve food security policies: for example, rather than maintaining widespread regulated prices for certain commodities, which means that the subsidy system is not very redistributive, would it not be more useful to move towards more targeted systems aimed at the poorest households?<sup>36</sup> The targeting of aid is in fact already partly applied in some countries through the geographical and social modulation of their food policy: distribution of national flour quotas according to the geographical

distribution of poverty in Morocco, increased quantities of flour for the most populated governorates in Egypt. But perhaps it would be possible to go further, for example by setting up direct income support, conditional on the purchase of food, for the poorest categories or by allocating highly targeted food vouchers. In the longer term, it is the general treatment of poverty that must be implemented. But this relates to economic and social policies (in particular the demographic issue in Egypt), as well as to the evolution of the political and geopolitical situations of the countries studied. This lies beyond the scope of this study.

### III.3. Improving logistics

Food safety is also linked to the quality of logistics, which can help in the fight against food waste and losses representing a true scourge in the region, as elsewhere (Blanc et Abis, 2014). A World Bank report (2007) mentioned the poor state of logistics in some of the five countries under review. Out of the 150 countries evaluated, Algeria ranked 140<sup>th</sup> with a logistics performance index of 2.06, Egypt 97<sup>th</sup> (2.37), Morocco 94<sup>th</sup> (2.38), while Tunisia and Jordan showed better performances, being respectively ranked 60<sup>th</sup> (2.76) and 52<sup>nd</sup> (2.89). In 2014, a new report (Arvis et al.) noted a clear improvement in Algeria, ranked 96<sup>th</sup> with an index of 2.65, in Morocco, which had risen to 60<sup>th</sup> position with a score of 2.9, and in Egypt, which had risen to 62<sup>nd</sup> position

36 In 2009, only one third of aid benefited the poor in Egypt. See Sélim et al, (2009), Egypt: subsidized and non-subsidized bread, ECON 302 Market research Project. Department of economics, American University of Cairo, Egypt.

with a score of 2.97. However, the situation deteriorated slightly in Jordan (60<sup>th</sup> with an index of 2.87), while the situation in Tunisia gave cause for concern, as the country dropped to 110<sup>th</sup> position with a deteriorated index of 2.54.

The subject of storage capacity is particularly relevant to the question of logistics. We are well aware that price shocks are all the more difficult to control when stocks (especially public stocks) are low. Storage capacity techniques have suffered from a lack of prioritization within management systems for far too long. This was no doubt due to the hasty conclusion that globalization was the end of food crises. But the crisis of 2007-2008 brought an end to this notion. In addition to the establishment of an international agricultural market information system (AMIS) created at the G20 in 2011, with a tailored version for Mediterranean countries (Med-Amin)<sup>37</sup> and in response to the challenge of global food commodity price volatility, the Food Policy Research Institute (IFPRI) in New York suggested, among other things, the establishment of an international system of public grain stocks, under the auspices of the UN, to feed the market in the event of imbalances. It is obvious, however, that while waiting for a hypothetical concerted action on an international scale - and even if it were to be implemented - we should also think of a storage policy on a national scale, and even better, regionally. However, pending

this hypothetical concerted action on an international scale - and even if it were to be implemented - should we not also be developing a national and/or regional storage policy?

Efforts have been made regarding storage policies in Algeria and also in Egypt, which doubled its capacity, between 2014 and 2019, from 1.5 million to 3 million with support from France and the United Arab Emirates. This demonstrates that the response to food insecurity can be managed via international cooperation. In addition, the Egyptian government aims to promote a port silo project in the Suez Canal Zone, which is to become a “grain hub” for the entire Middle East.

#### III.4. Access to a quality diet

As seen above, dietary quality does not seem to be changing for the better. Increasing saturated fats and sugar contents are causing a sharp rise in obesity, particularly in Jordan and Egypt, where the respective rates of 35.5% and 32% exceed the regional average of 29.5%. We can also note a high occurrence of type 2 diabetes and cardiovascular diseases. This underlines that the notion of food security for the poorest populations does not just mean access to food, but also access to a varied and nutritional diet.

It is interesting to note that the region actually invented the balanced diet. The study by Keys (1997) and Keys et al. (1986) shows that the Mediterranean

37 Under the political impetus of the CIHEAM Ministers of Agriculture meeting in 2012, the network was created in 2014, bringing together the 13 CIHEAM member states. Given the cereal dependence of some CIHEAM countries, it is hardly surprising that cereal markets are at the heart of the monitoring mechanism.

diet makes a positive contribution to public health and the conservation of resources. A team of researchers (Hachem et al., 2016) has made an inventory of these amenities in terms of public health and the environment. The Mediterranean diet is much more sparing in the use of water than the Western diet: the water footprint of the western diet is 70% higher than that of the Mediterranean diet. Regarding biodiversity, the Mediterranean diet maintains a relationship with endemic resources that is dwindling with the development of intensive farming methods. However, these researchers also noted a massive erosion of the Mediterranean diet due to urbanization and food globalization. A transition back to the Mediterranean diet would therefore be beneficial not only for the population's health, by enriching the nutritional quality of rations, but also for the environment, by sparing resources at a time when climate change weighs heavily.

Would this also benefit food dependency in the countries under review? The question deserves to be raised, as cereals compose around 50% of Tunisian and Algerian diets, and even 60% in Morocco and Egypt. In this regard, a report published by IFAD, the FAO and the World Bank (2009, op.cit) recommended launching awareness-raising campaigns to promote changes in food rations in Arab countries, which seemed to be a step in the right direction. But these changes should favor a balanced Mediterranean diet, rich in fruit and vegetables - many of which are produced in the countries concerned

– and in endemic whole grain cereals, rather than so-called refined cereals, which are often imported. Obviously, this would not prevent grain imports, but it may at least help to reduce them while also benefiting the environment and biodiversity.

This would require a range of policy measures, including campaigns to promote such a diet among the poorest members of the population. Indeed, so far the only approach has often been to simply guarantee sufficient calorie intake - hence the subsidies on commodities including refined cereals – rather than enabling them to eat a varied diet.

### **III.5. What can be achieved through international cooperation?**

As it has already been largely underlined, food security is as much about access, which is strongly linked to development, as it is about internal food availability and securing external supplies. While internal socio-economic and political dynamics are decisive, particularly in terms of the institutions that facilitate the emergence of “trustworthy societies”, both Mediterranean cooperation and Euro-Mediterranean collaboration can provide a valuable contribution to this food security. This can be achieved directly, by facilitating technological transfers, promoting scientific and agronomic cooperation, and partially financing the rural policies required to reduce poverty, and, in parallel, by enabling shared prosperity that creates income earning opportunities and promotes a balanced and healthy diet.

In the agricultural field, CIHEAM developed a number of scenarios and recommendations (Box 2), as did Rastoin et al (2012) in an IPEMED report, which envisaged a Euro-Mediterranean agricultural and agrifood policy based on the

complementarity of the two shores. In the same spirit, FEMISE, in a 2013 report directed by Khaoua, proposed an ecodevelopment approach within the framework of the EuroMed Partnership. Here again, the necessary instruments were clearly identified.

## Box 2: Retrospective of a virtuous scenario

In 2008, it was time to open up new horizons. Hervieu, Abis and Blanc (2008), in a CIHEAM prospective report on “The future of agriculture and food in the Mediterranean”, imagined a virtuous scenario entitled “a secure Euro-Mediterranean”: “ By the end of the 2020s, the Euro-Mediterranean region would thus have a concerted, even integrated, agricultural and agri-food development model, committed to true sustainability[...]. This agricultural, environmental and rural development policy would create a de facto solidarity that would make partnership increasingly essential. The policy would be a factor of cohesion between the States and a factor of social cohesion (reinforced food security, mitigation of conflicts between water users, etc.). [...]. This strategic policy could help prevent the risks of environmental degradation and promote the protection of rural landscapes while stimulating economic diversification in the countryside, which is once again a source of growth and innovation for SEMCs. It would also ensure better food safety and quality [...]. Its mission would be to meet the following major objectives: to ensure the independence and food security of the Euro-Mediterranean area, to contribute to the fight against climate change, to participate in the preservation of the environment and biodiversity and, to shape new socio-economic balances between rural territories and the urban world.

However, this Euro-Mediterranean cooperation, particularly in the agricultural field, did not take off in 2012. Even worse, it is the pessimistic scenario also envisaged by the CIHEAM that unfortunately seemed to predominate. This scenario mentioned in particular the possibility of “the emergence of social revolt and bitter conflict, [...] caused by growing inequality”. This is indeed what happened, and these uprisings contributed to fueling civil wars (in particular in Syria and Libya)

and authoritarian regimes. Meanwhile, the aftermath of the 2008 financial crisis left European countries in an economic situation that was hardly conducive to cooperation, while national-populism was spreading across the old continent. Thus, despite the many virtues of its institutions, the Euro-Mediterranean process has progressed in slow motion. However, ideas have set down their roots, particularly in the agricultural and food sector, as we have just seen in the various reports<sup>38</sup>.

38 Some of these ideas have already been put into practice. For example, the ARIMNet programme, initiated in 2008 for a period of 10 years and financed by the European Commission, aimed to promote synergies and encourage cooperation between Mediterranean countries in the field of agricultural research.



While waiting for this Euro-Mediterranean framework to gain new impetus, the Mediterranean countries must further develop their response to the food crises caused by the global crises that are currently shaking the region. Of course, the States hold the main leverage and we have drawn up the outlines of certain public policies relating directly and indirectly to the food issue. But cooperation between states on a smaller scale than the entire Euro-Mediterranean region is a one of the possible levers. In this respect, organizations such as CIHEAM and ACSAD (Arab Center for the Studies of Arid zones and dry lands) are to be supported, as they engage in research, training and exchange of good practices in irrigation management, agroecology, promotion of the Mediterranean diet and labeling of Mediterranean products, all areas where their expertise is broadly recognized. Having proven itself in these areas since its creation in 1962, the CIHEAM has recently been involved in a number of projects aimed at promoting agricultural cooperation. One example among others is the implementation, as we have seen, of an agricultural price monitoring system (Med-Amin), so direly needed in this region, which is subject to price shocks, particularly due to its dependence on cereals. In this respect, maybe it is time to overcome the reticence shown by some Arab countries, in particular those of the Maghreb, to envisage the implementation of a grouped purchasing policy. With Russia back on the world markets, competition between suppliers is increasing and buyer countries can

take advantage of this. This could be an opportunity to aggregate demands for better purchasing and contracting conditions? Parallel to this, the storage policy, which is necessary to absorb price shocks, as highlighted, could also be developed according to a supranational scheme. Given its geographical position and financial support, Egypt can not only improve its own capacity but also serve as a storage hub on a larger scale. Similarly, the Maghreb countries could set out to devise a common storage policy.

On the subject of water control, regional cooperation on the management of shared water resources should be supported. The Northern Sahara Aquifer System (NSSA), which we have seen is already under pressure, requires strong cooperation to avoid excessive drawdown. Over the last forty years, drilling has increased water extraction from 0.6 to 2.5 billion m<sup>3</sup>/year, which has led to worrisome signs. In addition to the lowering of the water tables, the Sahel and Sahara Observatory (OSS) has further analyzed the functioning and evolution of the system, and notes the disappearance of artesian groundwater and the drying up of outlets since the beginning of the millennium, confirmed by the aforementioned study by the United Nations Economic Commission for Europe in 2020.

An OSS report (2003) also recommended the need for the emergence of “basin awareness” and the concerted management of this shared resource. But the troubled situation over the 2010 decade, notably due to the civil



war in Libya, has so far been a major obstacle. This certainly doesn't detract from the importance of this institution as regional cooperation around water resources offers hope for the Nile, which is currently causing Egypt to fear for its future, and for Jordan, which is desperately parched. But the future of the concerted management of these basins is also subject to geopolitical developments that exceed the scope of this study.

## IV. Recommendations

This analysis gives rise to the following recommendations:

1. The climate and natural conditions present in the countries of the Mediterranean region do not allow them to produce sufficient essential foodstuffs to meet their dietary needs. The dangers related to water scarcity mean that it would be neither possible nor advisable to implement food autarky strategies. However, these countries can reduce their very high dependence on food imports by increasing their own production.
  2. To increase food production, it will be necessary to:
    - Protect farming land (through the implementation of land mapping systems to protect land with high agricultural potential, the setting up and/or enforcement of land use plans).
    - Install water-saving irrigation systems and to rehabilitate water supply systems to reduce water extraction<sup>39</sup>.
    - Continue the development, after a period of heavy investment in large dams, of small-scale hydropower, which reduces exposure to water loss while being less costly.
    - Improve the use of rainwater resources through improved practices that are financially sustainable for the countries, including with the support of international financing.
    - Develop a research strategy to identify crops with a high added value yield per cubic meter of water, with the understanding that this must be developed to take local situations into account. This crop research strategy should, in addition to water constraints, focus on the need to promote the Mediterranean diet.
    - Improve crop productivity through agronomic and genetic research.
- In any case, it will become a matter of urgency for the countries of the region, when they share the same river basin, to cooperate in the field of water resources management. As already highlighted in the World Bank report (2018), there is a need to promote an integrated regional

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39 We may note that one of the conclusions of the MISTRALS project (<https://www.insu.cnrs.fr/fr/cnrsinfo/vers-une-meilleure-gestion-de-leau-agricole-en-mediterranee-du-sud>), coordinated by the CNRS, is that despite ambitious public policies encouraging the modernization of practices (conversion to drip irrigation, water harvesting, deficit irrigation, and the reuse of waste water), these remain insufficient. The systems in the region must be developed much further to include a global and integrated vision of water management and related issues. To aid decision-making in this field, it would be useful to undertake a specific study on the most appropriate systems for the region, in order to achieve the greatest possible rationalization of water use in the Mediterranean.

approach to the management of water scarcity, mainly by strengthening collaboration and integration between different countries that share access to water.

3. Generally speaking, the countries of the region must establish agricultural models that meet the requirements of food security (by increasing production, as mentioned above), environmental constraints (climate change and pressure on water resources) and the need for more inclusive growth (poverty reduction, particularly in rural areas). The approach we propose is based on agroecology, which relies on more natural processes (especially in terms of soil biology), while allowing a coherent approach combining progress in productivity, the sparing use of limited resources and the fight against climate change. Along these lines, the Circular Economy Applied to the Food Sector in Coastal Cities project<sup>40</sup>, recently adopted within the framework of the Two Rivers Shores Dialogue, is entirely consistent with the approach that we are promoting. The major challenge is to move beyond a local project to integrate this approach within the countries' agricultural strategies with the support of political leaders and stakeholders. Moreover, the need for an integrated approach, as we advocated, that encompasses the three issues (food security, water management and environmental constraints), is underlined in the latest Plan Bleu report (2020), among others, including taking into account the negative effects of desalination on the environment<sup>41</sup>.
4. A successful transition to this new agricultural model must include the implementation of a large-scale rural development policy to develop and increase the productivity of family farming (access to credit, access to the market, access to training, ensuring land security, development of infrastructure, etc.).
5. The agri-food industry must be further reinforced, in particular through a more integrated approach. The development of regional value chains has a high potential for job creation. As such, they should be encouraged and be the focus of in-depth analysis.
6. Developing social policies to support households through safety nets that best target the poorest populations could ensure their access to a varied and high quality diet. Governments in the region have responded to the Covid-19 crisis increasing spending on social protection. The extent and type of support varies between countries. Most of them have cash transfer programs in place. These support policies could be made more effective by better targeting the most vulnerable households and, in the medium term, by paying the benefits directly to women. Indeed, it has been shown in

40 <https://dialogue-2-rives.fr/projets/circular-economy-applied-to-the-food-sector-in-coastal-cities/>

41 "Malgré les progrès technologiques, les rejets des stations de dessalement restent un enjeu environnemental pour les écosystèmes côtiers. Les stations de dessalement donnent généralement lieu à des rejets de saumures résiduelles hautement concentrées issues du fonctionnement et du nettoyage des stations et des unités de prétraitement. Ces polluants augmentent la température, la salinité, les courants et la turbidité de l'eau et causent des migrations de poissons." (Plan Bleu, 2020).

other developing and emerging regions that a much higher proportion of the benefits received by women are used for food and child-related expenses than if they were received by the father. In-depth studies are required to understand how the support given to households might be improved, in particular regarding conditions for implementation and optimization for increased effectiveness.

7. Promoting a food policy that encourages populations to eat a better diet by re-adopting the Mediterranean food model. In addition to the massive use of information campaigns via the media and social networks, a change in eating habits requires a strong mobilization on behalf of healthcare professionals. To be successful, these information and awareness campaigns must be supported by well targeted agricultural programs and cash support.
8. Revitalising cooperation between Europe and the Mediterranean countries in the agricultural sector. Europe must continue and even strengthen these programmes to finance projects that contribute to the intelligent development of agriculture in the region (such as the PRIMA project<sup>42</sup>), taking into account local conditions and integrating the issue of water management, adaptation to climate change and the need for inclusive growth. It is important to evaluate the results of these programmes in a clear and visible way

for all, using quantifiable criteria and involving civil society in the evaluation process. To further develop cooperation between Europe and the Mediterranean countries, the European market should be more broadly open to agricultural and agri-food products from the South. This might require an evolution of the Common Agricultural Policy (CAP) to integrate the imperatives of enhanced food security in the South and the development of sustainable agriculture practices that can create decent jobs and greater added value. Europe must also continue to provide the region with technical and human support to enable Mediterranean countries to meet the phytosanitary and regulatory standards for access to its market. Europe could also engage in a new type of partnership with Mediterranean countries to help improve the agricultural situation of the region, by financing training (or performance enhancement knowledge transfer), and the possibility of North-South mobility, both for students and young workers.

9. Moving towards regional cooperation, with a real political ambition, by launching a common agricultural programme for the Mediterranean, in order to have grouped purchasing policies, a common storage policy, joint research and training projects, exchanges of best practices in irrigation and agro-ecology, harmonization of non-tariff measures, facilitation of trade at borders, labeling of Mediterranean products, etc.

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42 Partnerships for Research and Innovation in the Mediterranean Area. The objective of this project is to achieve, support and promote the integration, alignment and joint implementation of national R&I programmes within a common research and innovation strategy to address the various challenges related to water scarcity, agriculture and food security.

These recommendations deserve further studying. A better understanding of the specific situation in each country is needed to develop a more targeted, operational, and in-depth analyses of the main issues raised. However, these recommendations provide useful guidance for Mediterranean countries, as well as suggestions for future research projects. It would indeed be useful to undertake additional analyses to develop this work. In addition to the questions raised in this chapter, directly related to food security, which could give rise to further research (design and implementation of a new agricultural model, strengthening of social policies, rural development, implementation of a regional agricultural and food policy, waste, etc.), this work highlights the need for targeted studies on issues such as the consequences of behavioural changes brought by the Covid pandemic<sup>43</sup> (use of digital technology, local market etc). Two important topics could also be the

subject of further work.

The first topic is the development of a coherent common agricultural policy and environmentally sustainable agricultural practices that generate decent incomes for the socio-economic benefit of rural communities – to be achieved within the framework of a revisited neighborhood policy and negotiations for the implementation of the FTAA (Comprehensive and Deep Free Trade Agreement, which should follow on from the Euro-Mediterranean Association Agreements).

The second important topic concerns the development of agri-food value chains between countries in the region: Can we identify those that are already established? Are there opportunities to develop them? If so, why do these opportunities not translate into effective regional value chains? This chapter thus opens up broad areas of analysis on which it will be useful to conduct further work.

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43 A study has been published on this subject, but only for the French case: Chiffolleau, Darrot et Marechal (2020), “Manger au temps du coronavirus”, Apogée.



## References

- Abis, S., Blanc P. and Hervieu B. (2008) Les futurs agricoles et alimentaires en Méditerranée, Mediterra, Rapport du CIHEAM, Sciences po Les presses.
- Arvis, J.F., Saslavsky, D., Ojala, L., Shepherd, B., Busch, C. and Raj, A. (2014) Connecting to Compete 2014: Trade Logistics in the Global Economy - The Logistics Performance Index and Its Indicators. World Bank, Washington, DC. World Bank.
- Ayeb, H. (2010) La crise de la société rurale en Egypte. La fin du fellah? Karthala.
- Banque Mondiale (2020) Trading Together — Reviving Middle East and North Africa Regional Integration in the Post-COVID Era, MENA Economic Update, October.
- Banque Mondiale (2018) Beyond Scarcity: Water Security in the Middle East and North Africa. MENA Development Report. Washington,DC: World Bank.
- Banque Mondiale (2007) Connecting to Compete: Trade Logistics in The Global Economy. Washington, DC.
- Ben Becher, L. (2014) Syndicalisme agricole et transition politique en Tunisie: enjeux, défis et perspectives, Mobilisations rurales en Méditerranée, Bibliothèque de l'Iremmo, 69-80.
- Billion, D. and Parant, A. (2020) La Bombe P, Futuribles, NO 438, Septembre-Octobre.
- Blanc, P., Proche-Orient: le pouvoir, la terre et l'eau, Paris, Les presses de sciences po, 2012
- Blanc, P. and Abis, S. (2014) Logistique et commerce agro-alimentaire. Un défi pour la Méditerranée, Mediterra, Rapport annuel CIHEAM, Paris, Presses de Sciences Po.
- Chiffolleau Y., Darrot C. and Marechal G. (2020) Manger au temps du coronavirus. Apogée.
- De Castro, J. (1952) Géopolitique de la Faim, Les Éditions Ouvrières.
- Fautras, M (2014), La terre entre racines, épargnes et spéculations: appropriations foncières et recompositions de l'espace rural de Regueb (Tunisie), Thèse de doctorat en géographie, Université Paris 10.
- FEMISE (2013) Évaluation de la stratégie du Maroc (Plan Maroc Vert) à l'aide d'un modèle d'équilibre général, Rapport Femise coordonnée par L. Oulhaj.
- FEMISE (2013) L'Écodéveloppement dans le cadre du Partenariat Euro-méditerranéen Application au Littoral d'Algérie et du Maroc, coordonné par N. Khaoua.
- Hachem, F., Capone, R., Yannakoulia, M., Dernini, S., Hwalla, N. and Kalaitzidis, C. (2016) La diète méditerranéenne, un modèle de consommation durable, In Mediterra. Zéro gaspillage en Méditerranée. Ressources naturelles, alimentations et connaissances, CIHEAM, FAO, Paris, Sciences po Les presses, 255-274.



- IFAD-FAO-World Bank (2009) Improving Food Security in Arab Countries, Report.
- Jouve A.M (2006) Les trois temps de l'eau au Maroc: l'eau du ciel, l'eau d'État, l'eau privée, in Eau et pouvoirs en Méditerranée, Confluences Méditerranée, P. Blanc (ed), 51-61.
- Keys, A. (1997) Coronary heart disease in seven countries, *Nutrition*, 13 (3), 249-253.
- Keys, A. Menotti, A. and Karvonen, M.J. (1986) Evidence That Diet Modification Reduces in Vivo Oxidant Damage, *American Journal of Epidemiology*, 50 (24), 903-915.
- Nawar, M.H. (2014) Current Status and prospective of farmers Unions and Syndicates in Egypt, *Mobilisations rurales en Méditerranée*, Bibliothèque de l'Iremmo, 81-93.
- Observatoire du Sahara et du Sahel (2003) Système Aquifère du Sahara septentrional, une conscience de bassin, Rapport.
- Plan Bleu (2020) Rapport sur l'Etat de l'Environnement et du Développement en Méditerranée, Programme des Nations Unies pour l'environnement.
- Purseigle, F., Nguyen, G. and Blanc, P. (2013) De la ferme à la firme: le nouveau capitalisme agricole, Paris, Presses de sciences po, 2017. Pierre Blanc, Matthieu Brun, Monde arabe: le salut alimentaire par la firme ? *Etudes rurales*, Revue de l'EHESS, n°191, 129-149.
- Raouf, M. and Elsabbagh, D. (2020) Impact of COVID-19 on the Jordanian economy Economic sectors, food systems, and households, IFPRI, Novembre.
- Rastoin, J.L., Bourgeois, L., Cheriet, F. and Movahedi, N. (2012) Pour une politique agricole et agrolimentaire euro-méditerranéenne, Rapport IPAMED.
- Summer, A., Hoy, C. and Ortiz-Juarez, E. (2020) Estimates of the impact of Covid-19 on global poverty, WIDER WP 2020/43, April.
- Wallis, J.J. and North, D. (1986) Measuring the Transaction Sector in the American Economy, 1870-1970, in *Long-term Factors in American Economic Growth*, S. Engerman and R. Gallman (Eds), University of Chicago Press.

## Chapter 2. What new export opportunities for Mediterranean countries?

*Patricia Augier and Michael Gasiorek*

### Key points of the Chapter

- A great number of factors (in particular, awareness of an excessive dependence on intermediate goods from Asia, consideration of the risk of supply disruption in the decision-making process of companies, the environmental costs of the entire production chain of goods and evolution of the regulatory frameworks in environmental matters) suggest a diversification and shortening of Global Value Chains (GVC).
- Mediterranean countries have the necessary assets (geographical and cultural proximity, competitive labor costs, etc.) to take advantage of these shifts affecting the region.
- We identify sectors and products from Mediterranean suppliers offering immediate opportunities for European companies to substitute part of the intermediate goods imported from distant countries, with products sourced from Mediterranean suppliers. These sectors and products also provide immediate opportunities to increase exports from Mediterranean countries to the EU.
- This is achieved by identifying intermediate goods that are imported by the EU from distant countries while also being exported (to other destinations) by the Mediterranean countries in question. We call these goods “common products”.
- There are between 400 and 500 of these “common products” per country, which create immediate opportunities for each of the Mediterranean countries and for European companies alike. From these “common products”, we derive the key industries (2-digits) and the key products (6-digits), retaining only those industries and products that represent a greater than 1% share in the exports of the given Mediterranean country. The names of these key industries and key products are stipulated for each country, the complete lists of 400 or 500 products being too cumbersome to be directly integrated.\*
- The key industries involved are few in number: 9 for Tunisia, 8 for Morocco and for Egypt and 7 for Jordan, while the 2-digit nomenclature includes 97 industries.
- The key intermediate products are also few in number: 12 for Morocco, 8 for Tunisia, 5 for Jordan and 3 for Egypt.
- These findings show that there are real opportunities to encourage exports-oriented investments in the selected industries in Mediterranean countries to serve the immediate needs of European markets that are currently importing those goods from Asia at an increased risk and at higher carbon footprint.

*(\*) These lists are available on request in Excel format.*

## Introduction

This chapter examines the opportunities that the post-Covid era might bring to Mediterranean countries for the development of their exports and, hence, the creation of jobs. The first section presents the reasons why the post-Covid context will be particularly favorable to Mediterranean industries. The second section focuses on identifying the sectors/products where Mediterranean countries have opportunities to increase their exports to the European Union. Meanwhile, these opportunities could offer immediate solutions to European companies seeking to substitute part of their intermediate goods imported from distant countries with those from Mediterranean suppliers.

### I. Why is this context an unprecedented opportunity for Mediterranean countries?

#### I.1. Two developments can be expected at the GVC level: Diversification and Shortening

The Covid-19 crisis has revealed that the world's production systems are highly dependent on Asia and, more particularly, on China. The automotive sector, for example, was forced in the first quarter of 2021

to sharply reduce its production due to a shortage of electronic parts, some of which are produced by less than five manufacturers in the world, all located in Asia<sup>44</sup>. More surprisingly, we observe that this dependence concerns other sectors, including the most sensitive ones, as shown in the following chapter with the pharmaceutical industry, as well as health, agri-food, energy, and even defense. In April 2020, the Vice-President of the European Commission, Vera Jourova, spoke of a “morbid dependence” on India and China for equipment, drugs and other diagnostic products, while referring to the fight against Covid-19.

Using both input-output tables and trade data, Baldwin and Freeman (2020) assessed the level of interdependence of the world's productive systems<sup>45</sup> and showed that the content of intermediate goods from China has increased significantly for all countries over the past decade. According to the European Bank for Reconstruction and Development (EBRD) (2020), about a quarter of the inputs used in high-tech exports (including pharmaceuticals and chemicals, machinery, vehicle engines, and other transportation equipment) from the United States, Japan, Korea, and Mexico come from China. This finding led Baldwin and Freeman to say that while it was clear

44 Le Monde (5 février 2021), Article by Ph. Escandre. Only two companies in the world know how to manufacture last generation microprocessors (Samsung in South Korea and TSMC in Taiwan).

45 Baldwin et Freeman (2000) calculate a total reliance indicator that takes into account both the direct content of imported inputs in domestic industrial production and the indirect content, which also reflects the source of imported input contents. For instance, the share of total reliance on inputs from China for the 4 countries that produce the most manufactured goods in the world rose from 8% in 2004 to around 28% in 2017.

that China's share of world industrial exports had risen sharply, the very strong growth in intermediate goods produced in China and exported to the world appeared to be a lesser-known fact. At the same time, the dependence of China's manufacturing output on intermediate goods from its main trading partners (Japan, the United States and Germany) has decreased.

How did we reach this level of dependence on Asia and such a high concentration of producers for certain goods? The situation results from the massive application, by large companies, of a model consisting of outsourcing the manufacturing of their inputs and choosing their suppliers according to a logic of cost minimization, regardless of their geographical location. This evolution towards a multi-country setting for production has been greatly intensified over the last twenty years by the concomitant decrease in transport costs, the generalized reduction of customs duties and by the decrease in coordination costs afforded by the development of information and communication systems<sup>46</sup>. Global value chains (GVC) -thus allow principals to take advantage of international competition to obtain their inputs at the best prices. In addition, large companies have also sought to reduce stocks as much as possible by extending the

“just-in-time” method to the entire system. This principle of inventory organization allows large companies to reduce their capital requirements. However, it makes the whole system vulnerable: a production failure or delivery delay of an input interrupts the entire production of the final good.

In Europe, this situation has caused a reaction in political circles that advocate a reduction of this dependency, as illustrated by Vera Jourova's statement: “We will review supply chains...try to diversify them and ideally produce as much as possible in Europe”<sup>47</sup>. This position is also found at the national level, particularly in Germany and France. Bruno Le Maire (French Minister of the Economy) referred to the reorganization of value chains to “gain independence and sovereignty”<sup>48</sup>. For Stefan Wolf, head of a major German automotive supplier company, “the Covid-19 pandemic has created a breach, it will lead to a profound reorganization of the German industry's subcontracting chains ... In the future, it can no longer be a question of just buying as cheaply as possible from China. Reorganizing subcontracting chains locally and relying more on German or European suppliers is the best way to extricate ourselves from our unbalanced dependence on certain regions”<sup>49</sup>.

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46 For more details on the development of global value chains, see Augier et al. (2019).

47 Statement by Vera Jourova, Vice-President of the European Commission on 19 April 2020.

48 Le Monde, 24 March 2020.

49 Le Monde, 4 June 2020.

But is it realistic to envisage a full-scale relocation of industries to Europe? The answer is clearly no, insofar as issues of European product competitiveness would quickly arise. Even if European citizens might be willing to pay more for products labeled “entirely made in Europe”, internationally, the increase in the price of exported goods as a result of higher production costs would reduce sales and result in market losses.

What, therefore, will be the most likely evolution? Under the assumption that in the future a large number of companies would no longer choose their supplies solely on the basis of the best price and would henceforth consider the risk factor, the result would be a greater diversification of their suppliers without necessarily reallocating to national or European territories. “Putting all your eggs in one basket does not diversify risk, even if the basket is at home<sup>50</sup>” (Javorcik, 2020). It can be expected that large companies will be increasingly pressured by their shareholders and agencies to diversify their suppliers to protect against the risk of producer failure or incidents affecting a particular geographic location. Risk management will become an increasingly important factor in decisions that will structure the organization of future international supply chains.

Can we expect this diversification of supply sources to be coupled with a shortening of value chains? As you will see in this report, we are convinced that this will be the case, for

several reasons. The first is that this shortening contributes, in addition to diversification, to reducing risk. The second, and probably the most important, is the need to move towards more sustainable development in the long term. GVCs, due to the fragmentation of production sites between different countries, may have a higher environmental cost. Sustainability concerns and related regulatory changes are likely to affect the business case for international production networks and reshape global supply chains. The carbon emission targets announced by many governments and the associated implementation plans (such as the proposal for a carbon tax at Europe’s borders, which is the subject of a forthcoming CMI study), will indeed change the cost calculations of multinationals and other firms regarding not only the levels of technology used in production, but also energy sources and transportation. These developments are also in line with the implementation of the SDGs (Sustainable Development Goals), in particular Goal 13 to fight against climate change. Moreover, new pressures on international production systems will come not only from policy and regulation, but also from the market. Consumer-citizens are increasingly aware of these environmental concerns and are more and more concerned by the way the goods they buy are being produced. The consideration given by citizens, especially Europeans, to the respect of social (child labor, working conditions of adults, etc.)

50 “Mettre tous ses œufs dans le même panier ne répartit pas le risque, même si le panier est chez nous”.



and environmental standards, as well as the number of kilometers traveled by the product inputs, will continue to grow<sup>51</sup>. Consumer pressure and reputational risks are factors that will push multinational companies to change their sources of supply and choose suppliers that are geographically closer and they know better. It should also be noted that an increasing number of stock markets are making it mandatory for large companies to present a report on their environmental and social commitments. One example is the Extra-Financial Performance Declaration (EFPD) imposed on large companies following a European recent directive. Finally, it should be noted that, as part of the European Green Deal, proposed in December 2019, EU trade agreements are expected to include social and environmental conditionalities, which will eventually have an impact on the choice of suppliers for European companies. Taken together, these elements point to a future shortening of GVCs.

Another factor that may encourage companies to shorten supply chains is

the rising cost of shipping. The cost of a container<sup>52</sup> rose from \$1,471 in May 2020 to \$4,931 in mid-May 2021. The largest increases are for containers from Asia. In the fall of 2020, CMA CGM (major French shipping company of Lybanese origin) acknowledged that China had asked them to contain price increases for fear that some multinational-owned factories would be relocated elsewhere<sup>53</sup>. This phenomenon is largely circumstantial<sup>54</sup>. However, given upcoming environmental regulations and the monopolistic structure of ocean freight markets, it is likely that post-Covid maritime transport prices will be higher than before the pandemic.

## **I.2. What are the opportunities for Mediterranean countries?**

This necessary combination of diversification and the shortening of GVCs may provide some countries with opportunities to win new markets; this is particularly true for Mediterranean countries. As seen above, it is in the interest of European companies to close the geographical gap with their suppliers, but a total relocation to Europe would weigh too heavily on

51 These findings show that: 73% of French people say that the notions of transparency and traceability justify paying more for a product (Enquête IBM 2020, Etudes NRF); 82% of French citizens say that companies with a negative carbon footprint should be financially sanctioned (Enquête IFOP 2020, Étude l'État, les entreprises et la RSE); the denim brand 1083 highlights the number of kilometers associated with the manufacture of a product. In addition, we are also seeing the emergence of ethical comparators for product brands, such as Moralscore, which take into account the commitment of companies to the environmental transition.

52 This is the Global Container Freight Index. The evolution of container prices can be seen on the Freightos Baltic Index website (<https://fbx.freightos.com>) but the data is only available for free download.

53 Le Monde, 4 February 2021.

54 Several factors explain this increase in the cost of maritime transport, including the reduction in the supply of containers following the crisis in Covid-19 and the failure of carriers to adjust supply, the unexpected rebound in demand in Europe and the United States due to massive recovery plans, the increase in demand for electronic products in countries subject to lockdown, the resumption of production in Asia before the other regions, etc.

production costs (linked essentially to much higher labor costs) and would challenge the competitiveness of European products. However, the EU could initiate a large-scale relocation policy that includes neighboring countries and, in particular, the Mediterranean countries. An industrial regionalization initiative of this nature, involving Europe and its neighbors, would offer many advantages and would benefit everyone, i.e. both European and neighboring countries:

- Politically, this initiative would relaunch the neighborhood policy on the basis of a more ambitious, federative, visible, and most likely, most likely more effective perspective in terms of positive socio-economic impacts in the neighboring countries.
- On the economic front, while ensuring a diversification of supply chains that limits the impact on production costs for European companies, such an initiative would contribute to the development of industries in neighboring countries and thus create jobs. This is what Mediterranean and European countries need: first, to reduce unemployment and inactivity rates among their populations and to offer prospects for improving their economic and social prospects; second, to avoid forced migration pressures and to create a Euro-Mediterranean large and strategic market for trade exchanges, additional investments and mutual benefits for Northern and Southern operators.

The Mediterranean countries could therefore benefit from this reorganization of value chains affecting European business, thanks to their numerous assets. First of all, they enjoy a privileged geographical position, being very close to Europe and on the border with sub-Saharan Africa. Their geographical proximity with Europe presents a number of advantages, in particular when compared to Asian countries; in addition, they are also closer to Europe in human, social and cultural terms:

- Trading with neighbours considerably reduces the environmental impact of products in terms of “product miles” (total distance travelled by the inputs, between the place of origin and the place of use, and by the final product, between the place of production and the place of consumption) and carbon footprint.
- Companies and citizens in Europe and SEMCs would be better protected in the event of new crisis situations (epidemiological, environmental, natural or technological disasters, etc.) ensuring continuity of access to goods. For example, as we will see in the next chapter, Asian manufacturers of pandemic-related products prioritized their buyers, favoring the domestic market and its neighbors. The nature of the relations and the agreements set up between principals and suppliers must also be taken into account; we believe this to be an additional argument in favor of co-production type relationships.

- This geographical and cultural proximity would allow principals to better control the manufacturing of inputs, particularly in terms of quality and compliance with standards, while taking into account consumers' preferences which they are familiar with. It also offers more flexibility to adapt production quantities, to introduce formulation changes (especially in the pharmaceutical field) or changes in manufacturing process. In a context of increasing environmental regulations and in anticipation of the European border carbon tax project, it will become increasingly strategic for principals to adapt and transform the production processes and the quality standards for manufacturing.

Meanwhile, their geographical position on the border of sub-Saharan Africa is also a boon for Mediterranean countries. Four of the five countries studied in this report are part of the African Continental Free Trade Area (AfCFTA), which came into effect in May 2019 and includes 54 countries. This area currently represents a market of 1.2 billion inhabitants and an estimated potential GDP of 2,500 billion dollars. The population could reach 2.5 billion by 2050. With the dismantling of tariffs and the adoption of a number of trade facilitation measures that should result from the implementation of this agreement, it is expected that Mediterranean countries will benefit from improved access to sub-Saharan countries and a consequent increase in intra-African trade. This will also position Mediterranean countries as destinations for transit and re-exporting towards Europe.

Regarding the cost of labor, the large average wage gap between Asian countries, particularly China, and the SEMCs countries, which still prevailed about ten years ago to the disadvantage of the latter, now tends to work against China. In the databases that allow for international comparisons, the minimum wage figures for the five Mediterranean countries are available only until 2013 (2012 for Tunisia). Figure II.1 thus compares, for 2013, the monthly minimum wage of the Mediterranean countries to EU countries (Belgium as a reference for high-income European countries, Bulgaria, Estonia and Romania as the countries with the lowest GDP per capita), to neighboring countries to the east of the EU (Turkey and Ukraine), and countries far from the EU (Brazil, Cambodia, China, Costa Rica, Indonesia, Malaysia, Thailand, Viet Nam). It appears that at that time, China had around the same level of wage costs as Tunisia (\$166) and was below Jordan (\$211), Algeria (\$227) and Morocco (\$278). The cost of labor in Bulgaria (\$210) was also lower than in these three countries, while Romania's cost of labor (\$240) was lower than Morocco's.

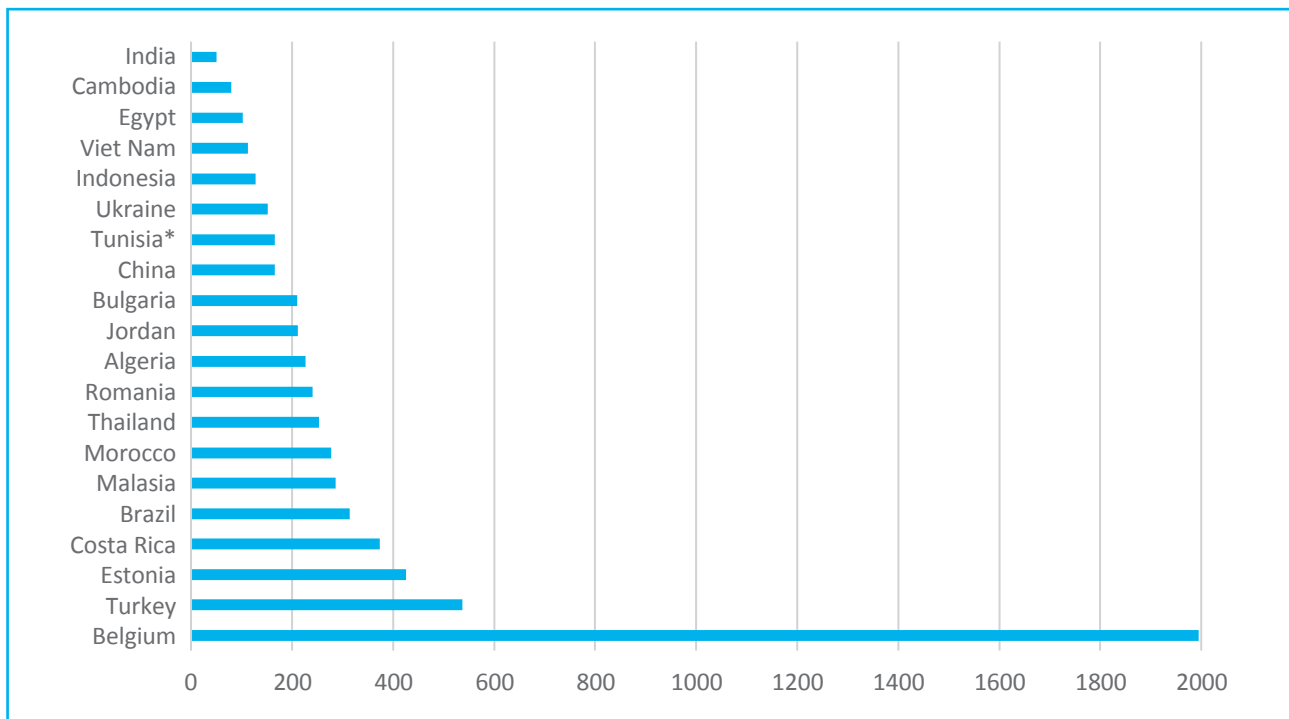
As shown in Figure II.2, alongside their economic development, wages in most of these comparator countries have risen sharply over the past 20 years. In 2010, the monthly minimum wage in Brazil, Bulgaria, China, Costa Rica, Estonia, Romania and Thailand ranged from \$100 (for China) to \$369 (for Estonia). In 2019, the minimum wage in these same countries ranged from \$220 (for Thailand) to \$604 (for

Estonia). Over the same period, wages in the Mediterranean countries have not increased as much. As a result, labor cost differentials between countries have changed: wages in Asia, and in particular in China, have caught up with (and in some cases far exceeded) wages in the Med countries, while wage differentials between the least advanced countries of the EU and the Mediterranean countries have increased. These developments clearly favor the later countries when it comes to cost of labor.

If we compare Mediterranean countries with EU countries and the rest of the world, we see that; the minimum wage in China (\$316) is

almost the same as in Morocco (\$322); in Bulgaria and Romania, the two EU countries with the lowest incomes per capita, the minimum wage is \$408 and \$562, respectively, compared to \$127 in Egypt, \$158 in Tunisia, \$199 in Algeria, \$322 in Morocco and \$367 in Jordan; the minimum wage in Estonia (\$717) is double the wage in Jordan and almost six times the wage in Egypt; in higher income European countries such as Belgium (which has a minimum wage of about \$2,000), the cost of wages exceeds five times that of Jordan, six times that of Morocco, ten times that of Algeria, thirteen times that of Tunisia and almost 16 times that of Egypt<sup>55</sup>.

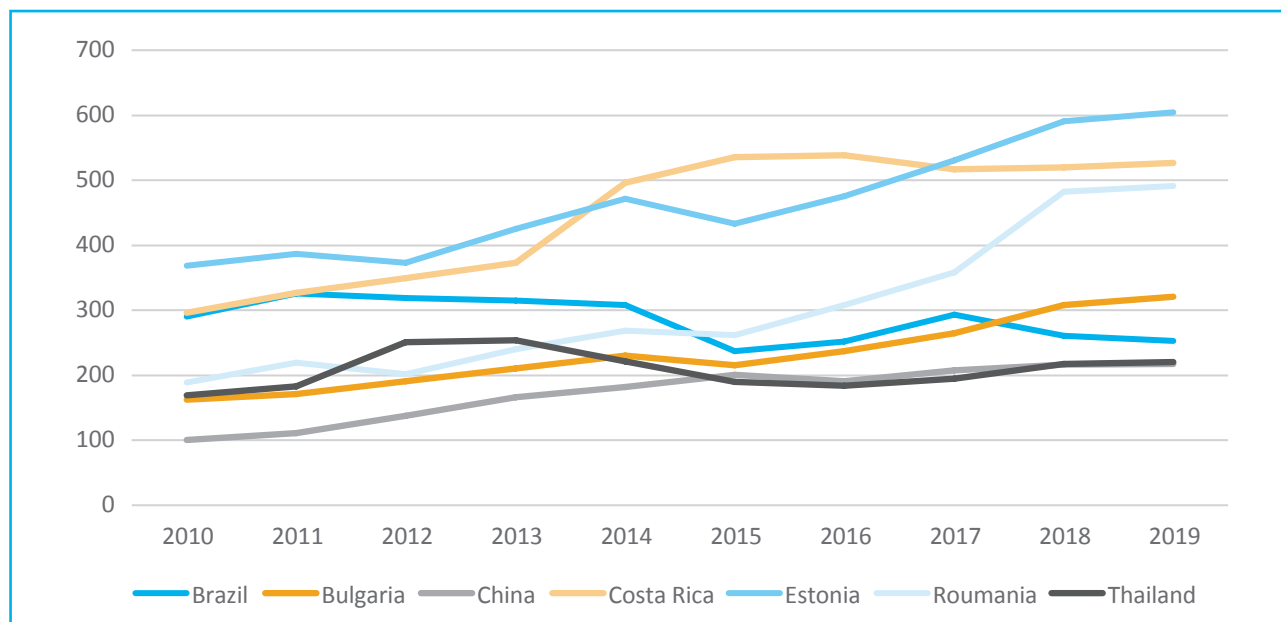
**Figure II.1. Minimum gross monthly wage in 2013 (nominal, in US\$)**



Source: *ILOSTAT*.

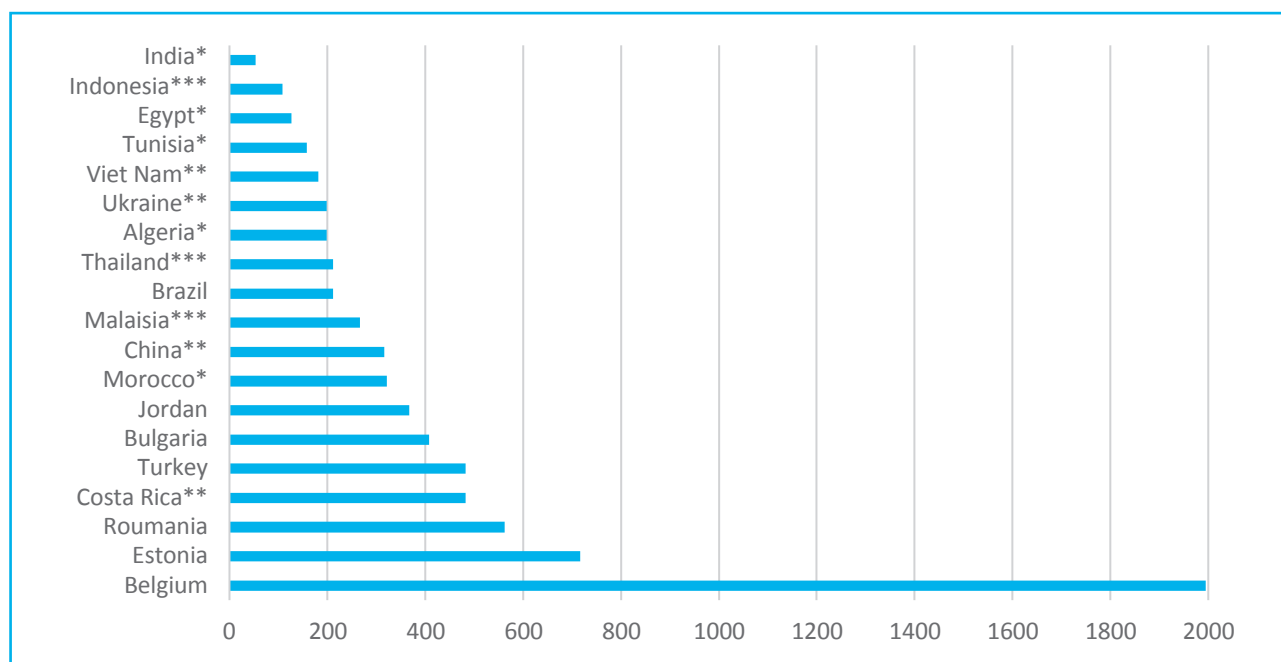
55 To give a more rigorous account of the differences in labor costs between European and Mediterranean countries, the analysis would have to be completed by including productivity levels. Since the objective here is only to present the most salient facts that characterize the current context, we have deliberately limited ourselves to a comparison of minimum wages.

**Figure II.2. Evolution of monthly gross minimum wages in comparative countries (nominal, in US\$)**



Source: ILOSTAT.

**Figure II.3. Minimum gross monthly salary in 2021 (nominal, in US \$)**



\* National data from 2021

\*\* 2020

\*\*\* 2019

Sources: *Countryeconomy.com* and *National Data*.

The general context presented here shows that European companies have every interest in turning to Mediterranean countries for their manufacturing and/

or input purchases. Hereafter, we will extend the analysis by identifying which products, or in which sectors, Mediterranean countries can offer the



intermediate goods needed by European firms. We will therefore seek to determine in which sectors and for which products, there are immediate opportunities for European companies to substitute part of the purchases of intermediate goods imported from distant countries, with purchases from Mediterranean suppliers.

## II. Identification of sectors/products of interest for European and Mediterranean companies

The aim of this work is to distill possible opportunities for the Southern and Eastern Mediterranean countries (SEMCs) to supply the European Union (EU) market following the COVID shock. Presupposing this work is the idea that, as a result of COVID, suppliers in the EU may be more inclined to buy fewer intermediates from more distant destinations and source these intermediates closer-to-home.

Closer-to-home could mean (a) Reshoring domestically, (b) Diversifying (i.e., buying from a wider range of suppliers in a wider range of countries), and/or (c) Buying from countries that are geographically closer. From the point of view of this analysis, (b) and (c) might offer opportunities for SEMCs.

Hence, the aim is to identify the sectors where these opportunities ‘might’ exist. To do this, we shall work along the following lines:

- Focus the analysis on intermediate goods imported by the EU.
- Identify which of these intermediate goods are exported by SEMCs.
- Identify the broader industrial groups of the products and the share they represent of the SEMCs’ total exports and identify the products in which the SEMCs have a revealed comparative advantage.

### Countries/Country Groups

For this analysis we will be looking at the following countries and country groupings:

- a) European Union (EU).
- b) Southern and Eastern Mediterranean Countries (SEMCs): Morocco, Egypt, Jordan and Tunisia<sup>56</sup>.
- c) Distant-Low-and-Middle-Income Countries (DLMICs) defined as countries that are more than 7000 km from Belgium and classified by the World Bank (June 2020) in the low, lower-middle and upper-middle income groups (62 countries).<sup>57</sup>
- d) Rest-of-the-world (RoW): World – (EU + SEMCs + DLMICs).<sup>58</sup>

56 We have decided to exclude Algeria from the group of SMCs as the Algerian exports are predominantly for fuels. In 2019, total EU imports of fuels from Algeria were equal to USD 19 billion, representing approximately 95% of imports from Algeria, whereas imports of intermediates from Algeria represented just 4% of imports.

57 The data was downloaded from UN Comtrade via WITS. We download the data for the HS 2012 nomenclature at the 6-digit level. The data covers the period 2015-2019, but data availability across products, countries and years varies.

58 The definition of intermediate products used for the purposes of this analysis follows the Narrow 1 definition, which treats products that fall under the ‘fuels’ category separately and excludes products that fall into the ‘motor passenger cars’ category.

## II.1. Overview

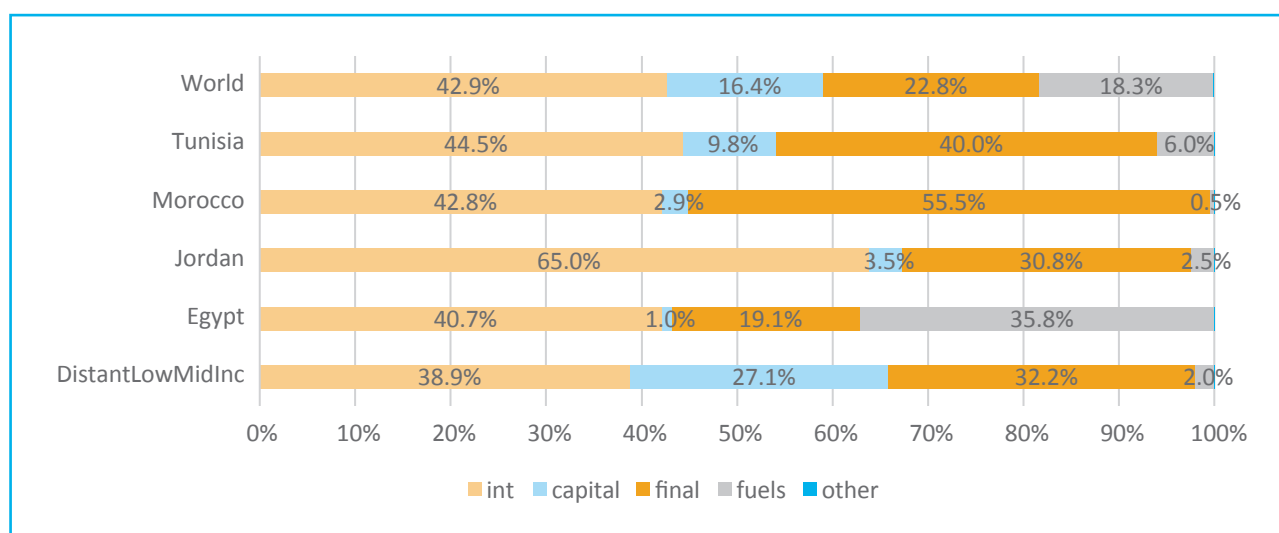
### • European Union (EU) Imports from the World, SEMCs and DLMICs

In 2019, the total value of imports of goods by the EU amounted to 2.25 trillion USD of which 964 billion USD concerned intermediate products. This equated to almost 43% of all imports, which also represented the largest share of imports by the EU. In contrast, final products amounted to 513 billion USD, or 23%, of EU imports; while fuels represented 400 billion USD, or 18%, and capital products 386 billion USD, or 16%.

This pattern is somewhat mirrored when looking at EU imports from

SEMCs and the distant low- and middle-income countries. The data show that EU imports in 2019 of intermediate products from Tunisia, Morocco and Egypt represented over 40% of all imports from each of the corresponding countries. This share was 65% for intermediate products from Jordan; and shy off 40% for imports of intermediates from DLMICs. The chart II.4 depicts EU import shares from the world, SEMCs and DLMICs in 2019 by product group. There are, however, considerable discrepancies in the value of imports from each of the SEMCs and DLMICs. Table II.1 shows the values of EU imports in 2019.

**Figure II.4. EU import shares by product group in 2019**



Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

**Table II.1. Values of EU imports in 2019**

| Million USD  |                   |                  |               |                  |                  |                     |
|--------------|-------------------|------------------|---------------|------------------|------------------|---------------------|
| Group        | DLMICs            | Egypt            | Jordan        | Morocco          | Tunisia          | World               |
| Capital      | 207,851.02        | 102.46           | 13.81         | 539.08           | 1,117.77         | 368,118.11          |
| Final        | 247,936.70        | 2,015.09         | 122.37        | 10,271.81        | 4,442.20         | 512,917.21          |
| Fuels        | 13,419.73         | 3,952.30         | 0.05          | 4.19             | 759.71           | 400,257.01          |
| Intermediate | 298,703.14        | 4,168.50         | 252.88        | 8,088.86         | 5,063.00         | 963,967.05          |
| Other        | 138.58            | 1.02             | 0.002         | 0.22             | 0.025            | 1,887.54            |
| <b>Total</b> | <b>768,049.18</b> | <b>10,239.38</b> | <b>389.11</b> | <b>18,904.16</b> | <b>11,382.71</b> | <b>2,247,146.92</b> |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

## II.2. Methodology

We employed a multi-stage methodology:

### 1. Identification of common products

In this stage of the analysis, we identified those intermediate products which are imported from DLMICs by the EU, and which are also exported by SEMCs to the world. It is important to identify the products that are exported as this is a signal of export capability. Hence this part of the analysis aimed to identify which intermediate products imported by the European Union are also exported by SEMCs. For this purpose, we defined a range of common products<sup>59</sup> for each SEMC using the top 1,000 intermediate products imported by the European Union from DLMICs countries and the top 1,000 intermediate products exported by each of the SEMC based on the 2017-2019 average import and export values, respectively. These 1,000 intermediate products were both imported by the EU from DLMICs countries and exported by the SEMCs.

The analysis then looks at the EU relative import shares for each product from the SEMCs, DLMIC and rest-of-the-world. The relative import shares from DLMICs also form the basis for subsequent analysis. We look at the number of common products and shares of SEMCs exports for the different quartiles of the relative shares. In other words, we are differentiating for cases where the EU imports less than 25%, between 25% and 50%, between 50% and 75%, and more than 75% of a ‘common product’ as defined above for DLMI countries.

The rationale behind this was to identify intermediate products which are imported by the EU, where a high share of those imports currently comes from DLMI countries, but which are also products exported by an SEMC. These products are potential natural candidates that SEMCs economies could supply to the EU, if firms in the EU were seeking to diversify their sources of supply, or to re-shore larger shares of their production ‘closer to home’. These correspond to cases (b) and (c) laid out in the objective of this study.

59 The full lists for each country are not included in an Appendix, but are available on request.

## 2. Revealed Comparative Advantage

There might also be opportunities for SEMCs even for products where there is currently a lower share of EU imports from DLMI countries. In the analysis that follows, we therefore assess the potential across the range of common products. One way of assessing the potential here for SEMC exporters is to assess their competitiveness in the potential products of interest.

We did this by calculating their revealed comparative advantage (RCA) for these products (for the RCA calculation, see box 1). Hence, for the common products, we then proceeded to identify the number of products for which the SEMC in question has a revealed comparative advantage in the world, and also a revealed comparative advantage relative to DLMICs.

### Box 1. Calculation of the Revealed Comparative Advantage (RCA)

The calculation of the RCA is based on the Balassa index. It corresponds to the ratio between the share of product  $j$  in the exports of country  $i$  and the share of this same product  $j$  in world exports. This indicator compares the export structure of a given country with that of all countries. It is calculated more precisely as follows:

$$RCA^i_j = \frac{X^i_j / X^i}{X_j / X}$$

With:  $X^i_j$ , exports from country  $i$  for the product  $j$ ,  $X^i$ , the country's total exports,  $X_j$ , the world exports of product  $j$  and  $X$ , total world exports, where country  $i$  is one of the four countries analyzed (Egypt or Jordan or Morocco or Tunisia).

This indicator was then normalized to make it symmetrical and bounded between -1 and +1:

$$RCAN^i_j = \frac{ACRN^i_j - 1}{ACRN^i_j + 1}$$

The standardized RCA is interpreted as follows: (i) if the share of a product in the exports of the given country is equal to the share of this product or industry in the world exports, its normalized RCA is equal to 0, (ii) if a product accounts for a larger share of a given country's exports than it does of world exports, its normalized RCA will be strictly positive (and bounded at 1), (iii) if, on the contrary, the share of a product in the exports of the given country is lower than the share of this product in the world exports, its normalized RCA will be negative (and bounded to -1).

### 3. Focus on key industry groups and their key products

Continuing on with our analysis of the “common” products, we then identified broader industrial groups which are more significant (those in the SEMCs) for overall trade. We did this by identifying the broader industrial groups at the HS 2-digit level *within the list of common products* and calculated their share within the SEMC's exports. Important industrial groups were defined as those that represent at least 1% of the SEMC's exports. We also identified the products within these broader groups where the SEMCs have a revealed comparative advantage. Finally, again among the common products, we found the corresponding 6-digit products that represent more than 1% of the exports of the SEMCs countries and labelled these as “important” products.

### 4. The main DLMIC competitors

Lastly, we used the range of important products to identify the main DLMIC competitors. This group was composed of 62 countries, and the aim was to identify the specific countries that form the largest share of EU imports for this subset of common products. We did this by looking at the relative share of EU imports from individual DLMICs out of the total EU imports from this group of countries.

### II.3. Morocco

In this part of the analysis we detail the methodology and results as applied to the case of Morocco. The results for the first phase of the analysis can be seen in Table II.2, which is based on the EU-Morocco common products, of

which there are a total of 535. The first column of the table gives the number of HS 6-digit products that fall into each of the EU share quartiles. Hence, for example, we see that there are 219 common products, for which the share of EU imports from the DLMI countries is less than 25%, and conversely there are 38 products where the DLMI countries account for more than 75% of EU total imports in those products.

The second column of the table identifies the share of the products (for each of the quartiles) in Moroccan exports to the EU, and the third column gives the corresponding share in Moroccan exports to the world. Hence, we see that in that first quartile for which there are 219 products, those products account for 24.2% of Moroccan exports to the EU, and for 32.2% of Moroccan exports to the world. We find, therefore, that the majority of Morocco's exports (including to the EU) of intermediate products are for products where EU imports from DLMICs are relatively lower. Conversely for the 38 products where the EU DLMI import share is high (i.e. above 75%), these products only account for 0.1% of Moroccan exports to the EU, and 0.2% of Moroccan exports to the World.

Finally, columns 4 and 5 provide information on Moroccan competitiveness for these products. Column 4 gives the number of products for which Morocco has a revealed comparative advantage in world markets, while column 5 gives the number of products for which Morocco has a revealed comparative advantage relative to the DLMI countries. If we



take the first row, for example, we see that out of the 219 common products Morocco appears to have a global

revealed comparative advantage for 35 of these, and relative to the DLMICs, for 56 products.

**Table II.2. Moroccan Exports of Common Products**

| EU-DLMIC Import Shares | (1) No of Products | (2) MAR-EU Exports | (3) MAR-WLD Exports | (4) RCA, WLD | (5) RCA1, DLMIC |
|------------------------|--------------------|--------------------|---------------------|--------------|-----------------|
| 0-25                   | 219                | 24.2%              | 32.2%               | 35           | 56              |
| 25-50                  | 173                | 10.5%              | 8.6%                | 29           | 34              |
| 50-75                  | 105                | 6.7%               | 5.9%                | 15           | 11              |
| 75-100                 | 38                 | 0.1%               | 0.2%                | 3            | 1               |
| <b>Total</b>           | <b>535</b>         | <b>41.5%</b>       | <b>46.9%</b>        | <b>82</b>    | <b>102</b>      |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

If we calculate the sum across all the rows, Morocco has a revealed comparative advantage for 82 of the 535 common products, and a revealed comparative advantage for 102 products relative to the DLMICs.

We then identified which industrial groups, and for which products within those industrial groups, Morocco has the most potential to export more of the 535 common products to the EU. As mentioned earlier, large industrial groups are defined as those that account for at least 1% of Morocco's exports for HS 2-digit products. The objective here is to provide an overview of the broader sectors where opportunities may exist. This can be seen in Table II.3. From the table it can be seen that there are 8 HS 2-digit industrial groups whose trade represents more than 1% of Morocco's exports, and hence are more significant for Morocco. For each of those 2-digit groups we once again decompose the information by quartiles of the DLMICs relative EU import shares. If we take the first row of the table as an example, the total column tells us that products within

HS-25 (Salt, Sulphur), account for 2.8% of Morocco's total exports, and that 2.7% of Morocco's total exports are in products where the share of EU imports from the DLMIC countries is less than 25%.

Indeed, if we look down the list of the 2-digit products we see that most of the potential opportunities appear to arise in sectors where currently less than 50% of EU imports come from DLMIC countries. In turn, this suggests that a high share of EU imports is already from countries which are not so distant, which might make it more challenging for Morocco to take advantage of any Covid induced near-shoring opportunities. But the fact that Morocco's export shares are very low for products heavily imported by the EU from distant countries also means that there are maybe opportunities to develop new industries in Morocco.

The final two columns of the table below contain the number of 6-digit products that constitute each industrial category, and the number of 6-digit products in each category for which Morocco has a revealed comparative advantage.

**Table II.3. Important Industrial Groups (Morocco)**

| HS 2 digit   |   | 0-25         | 25-50        | 50-75        | 75-100       | Total         | No         | RCA       |
|--------------|---|--------------|--------------|--------------|--------------|---------------|------------|-----------|
| 25           | Salt; Sulphur   | 2.71%        | 0.02%        | 0.00%        | 0.02%        | 2.75%         | 11         | 5         |
| 28           | Inorganic chemicals   | 4.82%        | 0.00%        | 0.02%        | 0.00%        | 4.84%         | 6          | 2         |
| 31           | Fertilizers   | 8.72%        | 0.00%        | 0.00%        | 0.00%        | 8.72%         | 6          | 4         |
| 84           | Machinery and mechanical appliances                         | 0.31%        | 0.71%        | 0.11%        | 0.00%        | 1.13%         | 56         | 2         |
| 85           | Electrical machinery and equipment                          | 9.24%        | 3.38%        | 4.63%        | 0.01%        | 17.26%        | 60         | 15        |
| 87           | Vehicles; other than railway rolling stock                  | 0.43%        | 0.69%        | 0.05%        | 0.00%        | 1.16%         | 15         | 3         |
| 88           | Aircraft  | 2.70%        | 0.00%        | 0.00%        | 0.00%        | 2.70%         | 4          | 2         |
| 94           | Furniture; stuffed furnishings; lamps and lighting fittings | 0.00%        | 1.07%        | 0.00%        | 0.05%        | 1.12%         | 9          | 1         |
| <b>Total</b> |   | <b>28.9%</b> | <b>5.86%</b> | <b>4.81%</b> | <b>0.08%</b> | <b>39.69%</b> | <b>167</b> | <b>34</b> |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

Hence, looking at the first row, we see that in the HS25 there are 11 6-digit products, and for 5 of these Morocco has a positive revealed comparative advantage.

Similarly, products in the electrical machinery and mechanical appliances (HS-85) industrial category represented 17.3% of Morocco's exports in 2019. This total share was aggregated from 60 intermediate products among which Morocco has an RCA for 15. A closer look at Morocco's export shares in this industrial group disaggregated by the DLMIC-quartiles reveals that 12.62% (9.24+3.38) of Morocco's export of intermediate products in this industrial group are for products for which the EU imports less than 50% from DLMICs; while 4.64% of Morocco's exports of common products in this industrial

group are for products for which the EU imports over 50% from DLMICs.

The second most important industrial group is for products in the Fertilizers category (HS-31). The 6 HS 6-digit intermediates products of this industrial category make up 8.7% of Morocco's total exports and is entirely for products for which EU imports from DLMICs are relatively low. The table also shows that four of these products have a revealed comparative advantage. Conversely, of the 56 common products in the machinery and mechanical appliances industry (HS-84), which represent 1.1% of Morocco's total exports, only 2 have a positive RCA.

Generally, only a small subset of products within each of the broader industrial categories in the table above make up the bulk of aggregated export

shares. The table below, shows the 6-digit products within these broader industrial groups that represent a share of at least 1% of Morocco's exports. For instance, in the table, there are 60 common products in HS-85 (electrical machinery and equipment). However, only 5 of these products individually account for an export share greater than 1% - the most important one being exports of insulated electric conductors, ignition wiring sets and other wiring sets of a kind used in vehicles, aircraft or ships (HS 854430), which alone represent 7.35% of Morocco's exports. Similarly, if we take the HS-25 industrial group salt and sulphur that represents 2.75% of Morocco's exports, we find that natural calcium phosphates (HS 21010) represent the overwhelming majority, and account for 2.59% of Morocco's exports.

Each of the 6-digit products from the preceding important industrial groups, which account for more than 1% of Morocco's trade, are detailed in the table below. From this table we can see that these 12 products aggregate to 33.85% of Morocco's exports, which is a very considerable amount given that the total export shares of all the common products amounted to 46.9% (see first table). The last two columns in the table give the normalized revealed comparative advantage for these industries, both in the world, and in the last column relative to DLMICs. The normalized RCA ranges from -1 to 1, where a positive number represents a revealed comparative advantage and a negative number the contrary. The table shows that for all these products Morocco has a strong RCA relative to the world and relative to DLMICs.

**Table II.4. Important Products (Morocco)**

| HS 6 digit   |   | MAR Exports   | RCA, WLD | RCA1, DLMI |
|--------------|---|---------------|----------|------------|
| 251010       | Natural calcium phosphates  | 2.59%         | 0.993    | 0.994      |
| 280920       | Phosphoric acid and polyphosphoric acids  | 4.8%          | 0.991    | 0.995      |
| 310540       | Monoammonium phosphate and mixtures   | 3.55%         | 0.986    | 0.987      |
| 310530       | Diammonium phosphate  | 3.20%         | 0.981    | 0.967      |
| 310310       | Phosphatic, superphosphates   | 1.23%         | 0.987    | 0.983      |
| 854129       | Electrical apparatus, transistors   | 1.51%         | 0.854    | 0.835      |
| 854442       | Insulated electric conductors, fitted with connectors   | 2.75%         | 0.874    | 0.796      |
| 853690       | Electrical apparatus  | 1.67%         | 0.763    | 0.744      |
| 854449       | Insulated electric conductors   | 1.59%         | 0.812    | 0.809      |
| 854430       | Insulated electric conductors, Ignition wiring sets and other wiring sets of a kind used in vehicles, aircraft or ships | 7.35%         | 0.941    | 0.892      |
| 880330       | Aircraft and spacecraft, parts of airplanes or helicopters  | 2.55%         | 0.705    | 0.892      |
| 940190       | Seat, parts   | 1.06%         | 0.719    | 0.646      |
| <b>Total</b> |   | <b>33.85%</b> |          |            |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

For the final part of the analysis, for these 12 products, we identified Morocco's principal DLMI competitors in the EU market. In the table below, the first column replicates the information found in the first column of the preceding table and gives the share of the product in Morocco's total exports. The industries are listed in order of importance, based on their shares in Morocco's exports.

In the subsequent columns, we identified the share of each country out of total EU imports from DLMI countries for each product. Hence, if we take the first row, we see that out of all EU imports from DLMICs for HS 854430, Mexico represents 41.82% of these imports, followed by China at 30.28%. Similarly, for phosphoric acid and polyphosphoric

acids (HS 280920) which represent almost 5% of Morocco's exports, 91% of EU imports of this product from DLMICs comes from China and 8% from South Africa. The table can therefore provide some insight into the diversification of EU imports from DLMICs for Morocco's important products.

The table shows that the main DLMI competitors for these products are predominantly China and Mexico. Other important competitors include Malaysia for aircraft and electrical machinery intermediates, the Philippines for aircraft intermediates and Vietnam for electrical machinery intermediates. Overall, Chinese competition is strongest for products that Morocco would be able to sell in EU countries.

**Table II.5. DLMIC Competitors of Important Products (Morocco)**

| Product Code | MAR Export | China   | Malaysia | Mexico | Philippines | South Africa | Thailand | Viet Nam |
|--------------|------------|---------|----------|--------|-------------|--------------|----------|----------|
| 854430       | 7.35%      | 30.28%  | 0.07%    | 41.82% | 3.10%       | 0.43%        | 2.09%    | 12.89%   |
| 280920       | 4.82%      | 91.08%  | 0.00%    | 0.12%  | 0.00%       | 8.63%        | 0.09%    | 0.00%    |
| 310540       | 3.55%      | 98.86%  | 0.00%    | 1.14%  | 0.00%       | 0.00%        | 0.00%    | 0.00%    |
| 310530       | 3.20%      | 16.20%  | 0.22%    | 83.46% | 0.00%       | 0.00%        | 0.00%    | 0.11%    |
| 854442       | 2.75%      | 90.73%  | 0.64%    | 3.25%  | 0.54%       | 0.04%        | 1.46%    | 1.83%    |
| 251010       | 2.59%      | 10.39%  | 0.05%    | 0.00%  | 0.00%       | 6.88%        | 0.00%    | 0.35%    |
| 880330       | 2.55%      | 38.37%  | 24.19%   | 9.97%  | 8.88%       | 5.27%        | 2.80%    | 1.54%    |
| 853690       | 1.67%      | 82.38%  | 2.77%    | 4.87%  | 1.87%       | 0.18%        | 2.27%    | 3.63%    |
| 854449       | 1.59%      | 91.20%  | 2.06%    | 3.97%  | 0.17%       | 0.10%        | 0.25%    | 1.48%    |
| 854129       | 1.51%      | 36.86%  | 42.16%   | 5.11%  | 12.83%      | 0.00%        | 2.13%    | 0.80%    |
| 310310       | 1.23%      | 100.00% | 0.00%    | 0.00%  | 0.00%       | 0.00%        | 0.00%    | 0.00%    |
| 940190       | 1.06%      | 76.00%  | 1.13%    | 8.47%  | 1.28%       | 1.73%        | 6.42%    | 2.92%    |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

## II.4. Tunisia

In the case of Tunisia, we found 505 common products, i.e., the number of HS 6-digit products that are imported by the EU from DLMICs and exported by Tunisia to the world. In a similar manner to the preceding case for Morocco, the majority of common products are aligned to cases where EU imports from DLMICs are relatively low. For example, out of the 505 common products, there are 199 common products for which the share of EU imports from DLMICs is less

than 25%. On the other hand, there are just 25 common products for which the relative share of EU imports from DLMICs is greater than 75%.

The final two columns in Table II.6 show that Tunisia has a revealed comparative advantage for 128 of the 505 common products, and a revealed comparative advantage for 151 products relative to DLMICs. Again, the predominant advantage for Tunisian exports seems to be for those products where EU imports from DLMICs are relatively low.

**Table II.6. Tunisian Exports of Common Products**

| EU-DLMI Import Shares | (1) No of Products | (2) TUN-WLD Exports | (3) TUN-EU Exports | (4) RCA, WLD | (5) RCA1, DLMI |
|-----------------------|--------------------|---------------------|--------------------|--------------|----------------|
| 0-25                  | 199                | 17.83%              | 14.94%             | 47           | 74             |
| 25-50                 | 185                | 13.50%              | 15.00%             | 47           | 47             |
| 50-75                 | 96                 | 10.77%              | 13.28%             | 29           | 27             |
| 75-100                | 25                 | 0.51%               | 0.48%              | 5            | 3              |
| <b>Total</b>          | <b>505</b>         | <b>42.61%</b>       | <b>43.70%</b>      | <b>128</b>   | <b>151</b>     |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

The table also shows that common products represent 42.6% of Tunisia's total exports to the world (column 2) and 43.7% of total exports to the European Union (column 3). We observe that in cases where EU imports from DLMICs are relatively low, these products constitute a larger share of Tunisian exports both to the EU and to the world. For instance, the 199 products in the first row represent 17.83% of Tunisia's total exports to the world, whereas the same products represent almost 15% of Tunisia's total exports to the EU. On the opposite end, the 25 common products for which the European Union imports

predominantly from DLMICs represent less than 1% of Tunisia's exports to the world and the EU.

Looking at the industrial groups and the corresponding products within these groups may provide more specific insight as to where opportunities might exist. We may recall that important industrial groups are defined as those for which the aggregated shares of HS 6-digit products within their corresponding HS 2-digit classification represent at least 1% of Tunisia's exports. Table II.7 shows this information and further decomposes



the export shares by quartiles of the EU's relative import shares from DLMICs. The last two columns in the table indicate the number of HS 6-digit

products within the broader industrial group and the number of HS 6-digit products that have a global revealed comparative advantage.

**Table II.7. Important Industrial Groups (Tunisia)**

| HS 2 digit   |   | 0-25          | 25-50         | 50-75        | 75-100       | Total         | No         | RCA       |
|--------------|---|---------------|---------------|--------------|--------------|---------------|------------|-----------|
| 28           | Inorganic chemicals   | 1.51%         | 0.00%         | 0.00%        | 0.00%        | 1.51%         | 8          | 2         |
| 31           | Fertilizers   | 1.56%         | 0.00%         | 0.00%        | 0.00%        | 1.56%         | 4          | 2         |
| 39           | Plastics and articles                                       | 0.88%         | 0.49%         | 0.11%        | 0.03%        | 1.52%         | 56         | 10        |
| 73           | Iron or steel articles                                      | 0.49%         | 1.32%         | 0.07%        | 0.00%        | 1.89%         | 31         | 9         |
| 84           | Machinery and mechanical appliances                         | 0.62%         | 1.11%         | 0.23%        | 0.00%        | 1.96%         | 60         | 5         |
| 85           | Electrical machinery and equipment                          | 6.11%         | 6.54%         | 8.81%        | 0.19%        | 21.65%        | 61         | 34        |
| 87           | Vehicles; other than railway rolling stock                  | 1.25%         | 1.39%         | 0.07%        | 0.00%        | 2.71%         | 14         | 4         |
| 88           | Aircraft  | 2.88%         | 0.00%         | 0.00%        | 0.00%        | 2.88%         | 3          | 2         |
| 94           | Furniture; stuffed furnishings; lamps and lighting fittings | 0.03%         | 0.96%         | 0.02%        | 0.12%        | 1.13%         | 8          | 4         |
| <b>Total</b> |   | <b>15.34%</b> | <b>11.81%</b> | <b>9.32%</b> | <b>0.34%</b> | <b>36.80%</b> | <b>245</b> | <b>72</b> |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

There are 9 industrial groups that, according to our definition, are considered as important for Tunisian exports. These 9 industrial groups represent almost 37% of Tunisia's total exports and are composed of 245 HS 6-digit common products among which Tunisia has a revealed comparative advantage for 72. However, eight of these nine HS 2-digit industries represent shares that are just between 1% and 3%, the exception being electrical machinery and equipment (HS-85).

We can consider a few examples from the table above to further clarify its

interpretation. Observing the first row in the table, we find that Tunisian exports of inorganic chemicals (HS-28) represent 1.51% of Tunisia's total exports to the world. This share is made up of 8 HS 6-digit common products for which the EU imports less than 25% from DLMICs. Two of the common products in this industrial groups have a revealed comparative advantage.

On the other hand, Tunisia's exports of common products in the electrical machinery and equipment industry (HS-85) represent 21.65% of Tunisia's total exports to the world. Out of the

61 products produced in Tunisia, the country has a revealed comparative advantage for 34. Interestingly for this industry (electrical machinery and equipment), exports do not seem to be biased towards products where EU imports from DLMICs are relatively

low, but are more spread out across the quartiles. In fact, for common products of the HS-85 industrial group where the EU imports more than 50% from DLMICs, Tunisian exports of these products represent almost 9% of Tunisia's total exports.

**Table II.8. Important Products (Tunisia)**

| HS 6 digit   |   | TUN Exports   | RCA, WLD | RCA1, DLMI |
|--------------|---|---------------|----------|------------|
| 854442       | Insulated electric conductors; fitted with connectors   | 6.63%         | 0.946    | 0.910      |
| 854449       | Insulated electric conductors; not fitted with connectors   | 2.74%         | 0.886    | 0.885      |
| 880330       | Aircraft and spacecraft, parts of airplanes or helicopters  | 2.65%         | 0.715    | 0.896      |
| 854430       | Insulated electric conductors, Ignition wiring sets and other wiring sets of a kind used in vehicles, aircraft or ships | 2.63%         | 0.843    | 0.725      |
| 853690       | Electrical apparatus, for switching or protecting electrical circuits   | 1.90%         | 0.789    | 0.772      |
| 853890       | Electrical apparatus, parts suitable for use solely   | 1.32%         | 0.759    | 0.819      |
| 870894       | Vehicle parts, steering wheels  | 1.25%         | 0.820    | 0.817      |
| 280920       | Phosphoric acids  | 1.11%         | 0.961    | 0.978      |
| <b>Total</b> |   | <b>33.85%</b> |          |            |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

It is important to note that the table also shows that more products within the broader categories do not always translate to larger aggregated export shares. The electrical machinery and equipment industry (HS 85) is the group with the largest number of products and largest export share, but the machinery and mechanical appliances (HS 84) and plastics (HS 39) group, composed of 60 and 56 products respectively, represent export shares amounting to less than 2%. Conversely, the aircraft parts group

(HS 88) only includes three products but these jointly represent an export share of almost 3%.

Perhaps somewhat unsurprisingly, five out of the eight important products, i.e., the HS 6-digit products with export shares greater than 1%, shown in the table below are for products of electrical machinery and equipment. The eight products have an aggregated export share of 20% and all have a strong revealed comparative advantage in the global market and relative to DLMICs.

**Table II.9. DLMIC Competitors of Important Products (Tunisia)**

| Product Code | TUN Export | China  | Malaysia | Mexico | Philippines | South Africa | Thailand | Viet Nam |
|--------------|------------|--------|----------|--------|-------------|--------------|----------|----------|
| 854442       | 6.63%      | 90.73% | 0.89%    | 0.64%  | 3.25%       | 0.54%        | 1.46%    | 1.83%    |
| 854449       | 2.74%      | 91.20% | 0.30%    | 2.06%  | 3.97%       | 0.17%        | 0.25%    | 1.48%    |
| 880330       | 2.65%      | 38.37% | 1.45%    | 24.19% | 9.97%       | 8.88%        | 2.80%    | 1.54%    |
| 854430       | 2.63%      | 30.28% | 6.56%    | 0.07%  | 41.82%      | 3.10%        | 2.09%    | 12.89%   |
| 853690       | 1.90%      | 82.38% | 0.97%    | 2.77%  | 4.87%       | 1.87%        | 2.27%    | 3.63%    |
| 853890       | 1.32%      | 70.24% | 2.94%    | 6.89%  | 8.61%       | 3.90%        | 5.30%    | 0.92%    |
| 870894       | 1.25%      | 67.64% | 0.01%    | 8.31%  | 11.07%      | 0.07%        | 9.46%    | 0.27%    |
| 280920       | 1.11%      | 91.08% | 0.00%    | 0.00%  | 0.12%       | 0.00%        | 0.09%    | 0.00%    |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

We will now look at the main DLMI competitors for the eight important products by considering the EU import shares of these products out of total imports from DLMICs. Table II.9 highlights a number of key competitors. Taking the first row as an example, we consider the most important common product for Tunisia's export market. This is insulated electric conductors fitted with connectors (HS-854442), which we saw represented almost 7% of Tunisia's exports to the world. EU imports of this product from DLMICs are almost entirely from China (90%), followed by Mexico, Thailand and Vietnam. Indeed, it is a similar story for Tunisia's second most important export product, insulated electric conductors not fitted with connectors (HS-854449). A few of the other main competitors include China, Indonesia, Mexico, Thailand and Vietnam for ignition wiring sets (HS 854430), Malaysia for vehicle parts (HS 870894), and Philippines for aircraft

and spacecraft; parts of airplanes or helicopters (HS 880330). Overall, China is Tunisia's main competitor for products that the latter could better sell to European firms.

## II.5. Egypt

When looking at Egypt, we found 428 common intermediate products that are imported by the European Union from DLMICs also exported by Egypt to the world (Table II.10). Once again, we disaggregated the information by quartiles of the EU's relative import shares from DLMICs and, likewise, we found that most of the common products are intermediates for which EU imports from DLMICs are relatively low. More specifically, 193 of the 428 common products that are exported by Egypt are products for which EU imports from DLMICs are less than 25%. These products represent just over 25% of total Egyptian exports to the world and just shy of 20% of total Egyptian exports to the European Union. Among these products, there are 59 for which

Egypt has a revealed global comparative advantage, and 85 for which Egypt has a revealed comparative advantage relative to DLMICs.

**Table II.10. Egyptian Exports of Common Products**

| EU-DLMI Import Shares | (1) No of Products | (2) EGY-WLD Exports | (3) EGY-EU Exports | (4) RCA, WLD | (5) RCA1, DLMI |
|-----------------------|--------------------|---------------------|--------------------|--------------|----------------|
| 0-25                  | 193                | 25.62%              | 19.46%             | 59           | 85             |
| 25-50                 | 132                | 7.01%               | 9.81%              | 33           | 29             |
| 50-75                 | 70                 | 1.88%               | 3.36%              | 17           | 14             |
| 75-100                | 33                 | 0.52%               | 0.76%              | 9            | 3              |
| <b>Total</b>          | <b>428</b>         | <b>35.03%</b>       | <b>33.39%</b>      | <b>118</b>   | <b>131</b>     |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

Common products for which EU imports from DLMICs are between 25-50% (second row in the table below) nevertheless represent a relatively important share of Egyptian exports. These shares equate to 7% and almost 10% for exports to the world and to the EU, respectively. A small fraction of these show revealed comparative advantages globally and relative to DLMICs.

Again, we find that common products mostly imported by EU from DLMICs represent an almost insignificant export share for Egypt, amounting to less than 1% of total exports to the world and total exports to the European Union.

Considering the broader industrial groups of the common products by aggregating their corresponding export shares revealed that there are eight industrial groups with export shares greater than 1%. In the case of Egypt, the 162 common products representing these industries amount to 24% of Egypt's total exports. Table II.11 reveals

that no industrial group represents an aggregated export share larger than 7%. Moreover, all products in the important industrial groups are heavily skewed to products where EU imports from DLMI countries are less than 25%.

This is particularly the case for salt and sulphur products (HS 25), fertilizers (HS 31) and natural, cultured pearls (HS 71). This last industrial group represents almost 7% of Egypt's total exports, which is the largest share out of the eight groups. Interestingly, this share is composed of just three common products, of which only one has a global revealed comparative advantage.

There is slightly more variation across the different quartiles for plastics (HS 39) and glass and glassware (HS 70). The former represents the second largest share of Egyptian products and also the largest number of HS 6-digit common products (64), which amount to this share. There are 20 products within the category grouping that show a revealed comparative advantage.

**Table II.11. Important Industrial Groups (Egypt)**

| HS 2 digit   |                                    | 0-25          | 25-50        | 50-75        | 75-100       | Total         | No         | RCA       |
|--------------|------------------------------------|---------------|--------------|--------------|--------------|---------------|------------|-----------|
| 25           | Salt; sulphur                      | 1.10%         | 0.01%        | 0.00%        | 0.00%        | 1.11%         | 9          | 5         |
| 31           | Fertilizers                        | 3.69%         | 0.00%        | 0.00%        | 0.00%        | 3.69%         | 6          | 3         |
| 33           | Essential oils; perfumery          | 1.27%         | 0.10%        | 0.00%        | 0.00%        | 1.37%         | 6          | 4         |
| 39           | Plastics                           | 3.92%         | 1.65%        | 0.26%        | 0.03%        | 5.87%         | 64         | 20        |
| 70           | Glass and glassware                | 0.10%         | 0.87%        | 0.04%        | 0.01%        | 1.02%         | 12         | 5         |
| 71           | Natural, cultured pearls           | 6.70%         | 0.00%        | 0.00%        | 0.00%        | 6.70%         | 3          | 1         |
| 72           | Iron and steel                     | 1.36%         | 0.39%        | 0.00%        | 0.00%        | 1.75%         | 33         | 6         |
| 85           | Electrical machinery and equipment | 0.69%         | 1.58%        | 0.44%        | 0.00%        | 2.71%         | 29         | 7         |
| <b>Total</b> |                                    | <b>18.84%</b> | <b>4.61%</b> | <b>0.74%</b> | <b>0.05%</b> | <b>24.23%</b> | <b>162</b> | <b>51</b> |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

Furthermore, if we consider the important common products for Egyptian exports, i.e., those products that represent at least 1% of Egypt's total exports, we find only 3 products. Table II.12 shows that 1 product (HS 710812) alone accounts for nearly all the aggregated share of Egypt's most important industrial group from the table above (this was natural, cultured pearls, HS 71). This is a very similar case to the fertilizers industrial group where 1 product (HS 310210) out of

6 makes up almost the entire export share for that industry group (HS 31). Lastly, and similarly, just one product (HS 390210) out of 54 in the plastics industrial group (HS 39) represents an export share larger than 1%.

Overall, this indicates that Egyptian exports of intermediate products are slightly more diversified than its Moroccan and Tunisian counterparts. There are no single products that constitute large export shares.

**Table II.12. Important Products (Egypt)**

| HS 6 digit   |  | EGY Exports   | RCA, WLD | RCA1, DLMI |
|--------------|--|---------------|----------|------------|
| 710812       | Metals; gold, non-monetary, unwrought (but not powder) | 6.61%         | 0.706    | 0.820      |
| 310210       | Fertilizers, mineral or chemical                       | 3.56%         | 0.971    | 0.968      |
| 390210       | Propylene, other olefin polymers                       | 1.14%         | 0.772    | 0.876      |
| <b>Total</b> |  | <b>11,31%</b> |          |            |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).



**Table II.13. DLMIC Competitors of Common Products (Egypt)**

| Product Code | EGY Export | Brazil | China  | Colombia | Mexico | South Africa | Thailand | Viet Nam |
|--------------|------------|--------|--------|----------|--------|--------------|----------|----------|
| 710812       | 6.61%      | 17.25% | 0.00%  | 36.13%   | 2.31%  | 28.51%       | 1.72%    | 0.00%    |
| 310210       | 3.56%      | 0.00%  | 68.28% | 20.35%   | 0.00%  | 6.57%        | 0.00%    | 2.57%    |
| 390210       | 1.14%      | 27.20% | 4.67%  | 2.64%    | 1.00%  | 56.54%       | 1.30%    | 3.56%    |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

Finally, looking at these three products, we analyzed some of the main DLMIC competitors. We did this by considering EU imports from individual DLMICs for each product. Table II.13 reveals that Colombia, South Africa and Brazil are the main sources of EU imports for Metals: gold, non-monetary, unwrought but not powder (HS 710812). Specifically, the figures show that almost 36% of the EU imports of this product from DLMICs are from Colombia, 29% from South Africa and 17% from Brazil.

The main DLMIC competitors for Egyptian fertilizers, mineral or chemical (HS 310210) are China, Colombia and South Africa: EU imports out of total imports from DLMICs for these products are 68%, 20% and 7% from these countries respectively. Lastly, South Africa and Brazil are Egypt's main competitors for Propylene, other olefin polymers (HS 390210). In total, for the 3 products with the highest potential for Egypt to export to EU markets, the country is competing mainly with South Africa, China and Colombia.

## II.6. Jordan

In our last case study, we look at Jordan. The analysis for this country considered 450 products that are

imported by the European Union from DLMICs and exported by Jordan to the world. The information is, once again, disaggregated by quartiles of the EU relative import shares from DLMICs. Table II.14 indicates that the majority of common products, like in the preceding case studies, are for those in which EU imports from DLMICs are relatively low.

Specifically, for 192 products out of the 450 intermediate common products, the EU imports less than 25% from DLMICs. These represent almost 19% of Jordan's total exports to the world and almost 20% of Jordan's total exports to the EU. Looking at the remaining columns in the table, Jordan appears to have a revealed comparative advantage for 38 of these products and a revealed comparative advantage relative to DLMICs for 62 of these products.

In the second quartile of relative EU import shares from DLMICs (25%-50%), we found 143 products. This is a considerable number of products for this quartile, but on a closer look, we found that they constituted a much smaller share of Jordanian exports to the world and to the EU. These shares equate to 3% and 1%, respectively. Likewise, a much smaller number of

products within this quartile appear to have a revealed comparative advantage. Conversely, in cases where the EU imports more than 50% of the common

products from DLMICs, these products do not represent very significant shares of Jordan's total exports neither to the world nor to the EU.

**Table II.14. Jordanian Exports of Common Products**

| EU-DLMI Import Shares | (1) No of Products | (2) JOR-WLD Exports | (3) JOR-EU Exports | (4) RCA, WLD | (5) RCA1, DLMI |
|-----------------------|--------------------|---------------------|--------------------|--------------|----------------|
| 0-25                  | 192                | 18.82%              | 19.95%             | 38           | 62             |
| 25-50                 | 143                | 2.95%               | 1.44%              | 17           | 18             |
| 50-75                 | 82                 | 0.62%               | 0.26%              | 5            | 4              |
| 75-100                | 33                 | 0.10%               | 0.14%              | 1            | 1              |
| <b>Total</b>          | <b>450</b>         | <b>22.49%</b>       | <b>21.78%</b>      | <b>61</b>    | <b>85</b>      |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

All in all, the 450 products represent 22.5% of Jordan's exports to the world and 22% of Jordan's exports to the EU. There are 61 products for which Jordan appears to have a global revealed comparative advantage, and 85 for which it appears to have a revealed comparative advantage relative to DLMICs.

We defined the important industrial groups by looking at the aggregated shares of the HS 6-digit common products within their corresponding HS 2-digit classification. We may recall that important industrial groups are defined as those where the aggregated shares represent at least 1% of Jordan's total exports to the world. Table II.15 shows that for Jordan, the EU market represents immediate export opportunities mainly for 7 HS 2-digit industries. Among these 7 industries, 124 products could constitute substitutable intermediate goods for European firms, while 24

of these have a revealed comparative advantage. Table II.16 further disaggregates the information by the quartiles of the EU's relative import shares from DLMICs.

The most important industrial group appears to be the salt and sulphur (HS 25) category. The aggregated share is made up of 12 HS 6-digit products which sum to 6%. For the vast majority of these products the EU imports less than 25% from DLMICs. Interestingly, Jordan seems to have a revealed comparative advantage for only 3 of these 12 products.

The pattern is closely mirrored by the remaining six broader industries. The aggregated shares are heavily skewed to products where the EU imports less than 25% from DLMICs. Overall, the products falling within this quartile make up almost 16% of Jordan's exports to the world, compared to the 1% share for products where the EU imports between 25% and 50% from DLMICs.

**Table II.15. Important Industrial Groups (Jordan)**

| HS 2 digit   |                                    | 0-25          | 25-50        | 50-75        | 75-100       | Total         | No         | RCA       |
|--------------|------------------------------------|---------------|--------------|--------------|--------------|---------------|------------|-----------|
| 25           | Salt; sulphur                      | 6.11%         | 0.01%        | 0.00%        | 0.00%        | 6.12%         | 12         | 3         |
| 28           | Inorganic chemicals                | 2.82%         | 0.00%        | 0.00%        | 0.00%        | 2.82%         | 11         | 3         |
| 30           | Pharmaceutical products            | 2.71%         | 0.00%        | 0.00%        | 0.00%        | 2.71%         | 6          | 3         |
| 34           | Soap; waxes, candles, dental waxes | 1.12%         | 0.00%        | 0.00%        | 0.00%        | 1.13%         | 4          | 2         |
| 39           | Plastics                           | 0.72%         | 0.80%        | 0.01%        | 0.00%        | 1.53%         | 53         | 7         |
| 71           | Natural, cultured pearls           | 1.70%         | 0.00%        | 0.00%        | 0.00%        | 1.70%         | 4          | 1         |
| 85           | Electrical machinery and equipment | 0.40%         | 0.73%        | 0.13%        | 0.00%        | 1.27%         | 34         | 5         |
| <b>Total</b> |                                    | <b>15.59%</b> | <b>1.54%</b> | <b>0.15%</b> | <b>0.00%</b> | <b>17.29%</b> | <b>124</b> | <b>24</b> |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

Furthermore, plastic intermediates (HS 39) have the greatest number of 6-digit products followed by intermediates of electrical machinery and equipment (HS 85). However, in both instances, only a small number of products appear to have a revealed comparative advantage.

The natural extension to the table above was to have a closer look at the individual 6-digit products that correspond to the industrial groups. Again, using our definition of important products as those that represent at least 1% of Jordan's total

exports, we found 5 such products. The most important one appears to be natural calcium phosphates (HS 251010), which amount to approximately 5% of Jordan's exports to the world. The remaining five products are spread across various industries and represent shares between 1% and 3%. This data suggest that all of these products have a global revealed comparative advantage and a revealed comparative advantage relative to the DLMICs. In the five instances, these products form the predominant total share of their respective industrial group.

**Table II.16. Important Products (Jordan)**

| HS 6 digit   |   | JOR Exports   | RCA, WLD | RCA1, DLMI |
|--------------|---|---------------|----------|------------|
| 251010       | Natural calcium phosphates  | 5.25%         | 0.996    | 0.997      |
| 280920       | Phosphoric acids  | 2.69%         | 0.984    | 0.991      |
| 300390       | Medicaments; for therapeutic or prophylactic uses, (not packaged for retail sale) | 2.48%         | 0.966    | 0.993      |
| 710812       | Metals; gold, non-monetary, unwrought (but not powder)                            | 1.69%         | 0.194    | 0.442      |
| 340290       | Washing and cleaning preparations   | 1.08%         | 0.929    | 0.955      |
| <b>Total</b> |   | <b>13.19%</b> |          |            |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

Finally, looking at these 5 important products, we analyzed the main DLMIC competitors by looking at EU total imports of these products from DLMICs and the respective shares for each individual DLMIC. Looking at Table II.17, for Jordan's most important product - natural calcium phosphates (HS 2510101) - the main DLMIC competitor is Zimbabwe, followed by Mozambique and China.

China is also an important competitor for other such important products including phosphoric acids (HS 280920) and medicaments (HS 300390). Out of total EU imports of these products from

DLMICs, 90% come from this country. South Africa stands out as the second most important competitor for these products, but the import shares from this country remain considerably lower than those for China. Brazil appears to be another important competitor for metal intermediates (HS 710812) and washing and cleaning preparations (HS 340290), but the origins of these products are somewhat more diversified across other competitors including Mexico, South Africa and Thailand. In total, with the exception of 2 products (metal and phosphate), the main competitor for Jordanian's important products, regarding immediate export to the EU, is China.

**Table II.17. DLMIC Competitors of Common Products (Jordan)**

| Product Code | JOR Export | Brazil | China  | Mexico | Mozambique | South Africa | Thailand | Zimbabwe |
|--------------|------------|--------|--------|--------|------------|--------------|----------|----------|
| 251010       | 5.25%      | 0.00%  | 10.39% | 0.00%  | 37.76%     | 6.88%        | 0.00%    | 42.46%   |
| 280920       | 2.69%      | 0.08%  | 91.08% | 0.12%  | 0.00%      | 8.63%        | 0.09%    | 0.00%    |
| 300390       | 2.48%      | 1.83%  | 89.18% | 0.15%  | 0.00%      | 4.11%        | 1.35%    | 0.00%    |
| 710812       | 1.69%      | 17.25% | 0.00%  | 2.31%  | 0.00%      | 28.51%       | 1.72%    | 0.00%    |
| 340290       | 1.08%      | 31.99% | 54.10% | 6.27%  | 0.00%      | 2.10%        | 2.08%    | 0.00%    |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

## II.7. Summary

We have looked at the country by country results; it therefore seems appropriate to assemble these findings into a brief comparison and to highlight some of the main results.

**First Outcome:** *Identification of intermediate goods needed by European firms and available in SMECs common products.*

Across the four countries we found approximately 400-500 products that are both imported by the EU from DLMICs and exported by SEMCs to the world, i.e., the common products.

This first step in identifying common products (i.e., both imported by the EU from distant developing or transition countries and exported by the Med countries) provides a near-exhaustive list of products that EU firms could buy from one of the SMECs countries to diversify their sources of supply and/or replace those from distant countries. The only products missing from this list could be those that the SEMCs have the capacity to produce but have not yet exported, or will export after 2019.<sup>60</sup>

For each country, most of the common products are intermediate goods for which EU imports from DLMICs are overwhelmingly below 25%. This could indicate that, to a certain degree, the EU is already sourcing intermediates closer to home. However, there are very few products exported by distant countries for which the share

of EU imports from SEMCs is very high. This shows that in addition to the immediate opportunities, there are also opportunities to generate production of specific intermediate goods in cooperation with European companies. Such cooperation may require targeted support from the EU.

Common products represent roughly between 30-40% of SEMCs' total exports, although the figure is slightly lower for Jordan, at 23% highlighting the importance of intermediates in SEMCs' export markets vis-a-vis the EU market and the potential opportunities not explored yet.

**Second Outcome:** Identification of the key industries in which we find the intermediate goods needed by European firms and available in Med countries.

We may recall that in order to identify the key industries concerned by these common products, we retained those whose share in total exports in each SEMCs is greater than 1%.

Thus, for each of the four countries, between 7 and 9 important 2-digit industries generally emerged from the list of 400-500 common products, forming the largest export shares. These varied between countries. More specifically, the most important for each country were HS 85 Electrical machinery and equipment for Morocco (17.26% of total exports) and for Tunisia (21.65%), HS 71 Natural, cultured pearls for Egypt (6.70% of total export) and HS 25 Salt, sulphur for Jordan (6.12%).

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60 To ensure a continuous watch on these intermediate goods "available" for European firms, it would be necessary to provide for a regular update of this list according to data availability. One way to ensure that this list as up-to-date as possible would be to have access to customs data for each SEMCs.



Table II.18 shows that, for SEMCs exports, there are 16 important industries (out of a total of 97 HS 2-digit sectors) where European firms can find the intermediate goods they need. Among these 16 industries, the HS 85 Electrical machinery and equipment sector appears for all

four countries. The industries found for 3 countries were HS25 Salt, sulphur (Morocco, Egypt, Jordan), HS28 Inorganic chemicals (Morocco, Tunisia, Jordan), HS31 Fertilizers (Morocco, Tunisia, Egypt) and HS38 Plastics (Tunisia, Egypt, Jordan).

**Table II.18. Key industries producing common products**

| Key industries in the 4 Med countries                          | Morocco | Tunisia | Egypt | Jordan |
|--|---------|---------|-------|--------|
| 25 Salt, sulphur   | x       |         | x     | x      |
| 28 Inorganic chemicals   | x       | x       |       | x      |
| 30 Pharmaceutical products                                     |         |         |       | x      |
| 31 Fertilizers   | x       | x       | x     |        |
| 33 Essential oils, perfumery                                   |         |         | x     |        |
| 34 Soap, waxes, candles, dental waxes                          |         |         |       | x      |
| 39 Plastics  |         | x       | x     | x      |
| 70 Glass and glassware   |         |         | x     |        |
| 71 Natural, cultured pearls, precious metals and Jewelry       |         |         | x     | x      |
| 72 Iron and steel  |         |         | x     |        |
| 73 Iron or steel articles                                      |         | x       |       |        |
| 84 Machinery and mechanical appliances                         | x       | x       |       |        |
| 85 Electrical machinery and equipment                          | x       | x       | x     | x      |
| 87 Vehicles; other than railway rolling stock                  | x       | x       |       |        |
| 88 Aircraft  | x       | x       |       |        |
| 94 Furniture, stuffed furnishings, lamps and lighting fittings | x       | x       |       |        |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

**Third Outcome:** Identification of the key intermediate goods produced by the selected industries.

Although there might be a considerably large number of products falling within

an industrial group, the largest share may be formed by only one or two products: HS 854430 Ignition wiring sets and other wiring sets of a kind used in vehicles, aircraft or ships for Morocco (7.35% of total exports), HS

854442 Insulated electric conductors; fitted with connectors for Tunisia (6.63%), HS 710812 Metals; gold, non-monetary, unwrought (but not powder) for Egypt (6.61%) and HS 251010 Natural calcium phosphates for Jordan (5.25%).

Table II.19 shows the 19 intermediate goods from the list of common products that account for at least 1% of exports from one of the Med countries. We can see that HS280920 Phosphoric acids is found in 3 of the 4 Med countries (Morocco, Tunisia, Jordan). 7 intermediate goods appear in 2 countries: HS251010 Natural calcium phosphates (Morocco and Jordan), HS710812 Metals, gold, non-monetary unwrought (Egypt and Jordan), HS853690 Electrical apparatus conductors (Morocco and Tunisia), HS854430 Insulated electric

conductors, Ignition wiring sets and other wiring sets of a kind used in vehicles, aircrafts or ships (Morocco and Tunisia), HS854442 Insulated electric conductors, fitted with connectors (Morocco and Tunisia), HS854449 Insulated electric conductors, not fitted with connectors (Morocco and Tunisia), HS880330 Aircraft and spacecraft, parts of airplanes or helicopters (for again Morocco and Tunisia).

It is important to note that all these intermediate goods have a very high revealed comparative advantage, both with regard to the world and vis-à-vis distant countries. This suggests that even if these products are already exported by SMECs to the EU, their share in European imports can still be substantially increased, as confirmed in Table II.20, which shows the European market shares of its main competitors.

**Table II.19. Key intermediate goods within selected industries**

| Key intermediate goods in the 4 Med countries |   | Morocco | Tunisia | Egypt | Jordan |
|---|---|---------|---------|-------|--------|
| 251010  | Natural calcium phosphates  | x       |         |       | x      |
| 280920  | Phosphoric acids  | x       | x       |       | x      |
| 300390  | Medicaments, for therapeutic or prophylactic uses, (not packaged for retail sale)                                       |         |         |       | x      |
| 310210  | Fertilizers, mineral or chemical  |         |         | x     |        |
| 310310  | Phosphatic, superphosphates   | x       |         |       |        |
| 310530  | Diammonium phosphate  | x       |         |       |        |
| 310540  | Monoammonium phosphate and mixtures   | x       |         |       |        |
| 340290  | Washing and cleaning preparations   |         |         |       | x      |
| 390210  | Propylene, other olefin polymers  |         |         | x     |        |
| 710812  | Metals; gold, non-monetary, unwrought (but not powder)  |         |         | x     | x      |
| 853690  | Electrical apparatus conductors   | x       | x       |       |        |
| 853890  | Electrical apparatus, parts suitable for use solely   |         | x       |       |        |
| 854129  | Electrical apparatus, transistors   | x       |         |       |        |
| 854430  | Insulated electric conductors, Ignition wiring sets and other wiring sets of a kind used in vehicles, aircraft or ships | x       | x       |       |        |
| 854442  | Insulated electric conductors, fitted with connectors   | x       | x       |       |        |
| 854449  | Insulated electric conductors, not fitted with connectors   | x       | x       |       |        |
| 870894  | Vehicle parts, steering wheels  |         | x       |       |        |
| 880330  | Aircraft and spacecraft, parts of airplanes or helicopters  | x       | x       |       |        |
| 940190  | Seat, parts   | x       |         |       |        |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).

The main DLMIC competitors for important products are predominantly large economies such as China, Brazil and Mexico. Other competitors include South East Asian economies such as Thailand, Vietnam and Indonesia, and other African economies such as South Africa and Mozambique. But the striking fact remains the strong domination of China. Out of the 16 key intermediate goods needed by European firms and available in Med countries, the share of Chinese products in EU imports for 12 of them ranges from 54% to 100%. These Chinese shares in EU imports are surprisingly high: China is, for example, the only country to sell

the product HS310310 (Phosphatic, superphosphates) and the shares in EU imports are above 90% for 5 intermediate goods out of the 16 key products for the Med countries (the HS280920 Phosphoric acids, the HS300390 Medicaments for therapeutic or prophylactic uses, the HS310540 Monoammonium phosphate and mixtures, the HS854442 Insulated electrical conductors, fitted with connectors and the HS854449 Insulated electrical conductors, not fitted with connectors). It is possible that beyond China's domination regarding these products, these extremely high market shares are linked to a concentration of producers.

**Table II.20. The main DLMIC competitors for important products exported by SEMCs on European markets**

| Morocco      |            |         |           |          |              |              |          |          |
|--------------|------------|---------|-----------|----------|--------------|--------------|----------|----------|
| Product Code | MAR Export | China   | Malaysia  | Mexico   | Philip-pines | South Africa | Thailand | Viet Nam |
| 854430       | 7.35%      | 30.28%  | 0.07%     | 41.82%   | 3.10%        | 0.43%        | 2.09%    | 12.89%   |
| 280920       | 4.82%      | 91.08%  | 0.00%     | 0.12%    | 0.00%        | 8.63%        | 0.09%    | 0.00%    |
| 310540       | 3.55%      | 98.86%  | 0.00%     | 1.14%    | 0.00%        | 0.00%        | 0.00%    | 0.00%    |
| 310530       | 3.20%      | 16.20%  | 0.22%     | 83.46%   | 0.00%        | 0.00%        | 0.00%    | 0.11%    |
| 854442       | 2.75%      | 90.73%  | 0.64%     | 3.25%    | 0.54%        | 0.04%        | 1.46%    | 1.83%    |
| 251010       | 2.59%      | 10.39%  | 0.05%     | 0.00%    | 0.00%        | 6.88%        | 0.00%    | 0.35%    |
| 880330       | 2.55%      | 38.37%  | 24.19%    | 9.97%    | 8.88%        | 5.27%        | 2.80%    | 1.54%    |
| 853690       | 1.67%      | 82.38%  | 2.77%     | 4.87%    | 1.87%        | 0.18%        | 2.27%    | 3.63%    |
| 854449       | 1.59%      | 91.20%  | 2.06%     | 3.97%    | 0.17%        | 0.10%        | 0.25%    | 1.48%    |
| 854129       | 1.51%      | 36.86%  | 42.16%    | 5.11%    | 12.83%       | 0.00%        | 2.13%    | 0.80%    |
| 310310       | 1.23%      | 100.00% | 0.00%     | 0.00%    | 0.00%        | 0.00%        | 0.00%    | 0.00%    |
| 940190       | 1.06%      | 76.00%  | 1.13%     | 8.47%    | 1.28%        | 1.73%        | 6.42%    | 2.92%    |
| Tunisia      |            |         |           |          |              |              |          |          |
| Product Code | TUN Export | China   | Indonesia | Malaysia | Mexico       | Philip-pines | Thailand | Viet Nam |
| 854442       | 6.63%      | 90.73%  | 0.89%     | 0.64%    | 3.25%        | 0.54%        | 1.46%    | 1.83%    |
| 854449       | 2.74%      | 91.20%  | 0.30%     | 2.06%    | 3.97%        | 0.17%        | 0.25%    | 1.48%    |
| 880330       | 2.65%      | 38.37%  | 1.45%     | 24.19%   | 9.97%        | 8.88%        | 2.80%    | 1.54%    |
| 854430       | 2.63%      | 30.28%  | 6.56%     | 0.07%    | 41.82%       | 3.10%        | 2.09%    | 12.89%   |
| 853690       | 1.90%      | 82.38%  | 0.97%     | 2.77%    | 4.87%        | 1.87%        | 2.27%    | 3.63%    |
| 853890       | 1.32%      | 70.24%  | 2.94%     | 6.89%    | 8.61%        | 3.90%        | 5.30%    | 0.92%    |
| 870894       | 1.25%      | 67.64%  | 0.01%     | 8.31%    | 11.07%       | 0.07%        | 9.46%    | 0.27%    |
| 280920       | 1.11%      | 91.08%  | 0.00%     | 0.00%    | 0.12%        | 0.00%        | 0.09%    | 0.00%    |
| Egypt        |            |         |           |          |              |              |          |          |
| Product Code | EGY Export | Brazil  | China     | Colombia | Mexico       | South Africa | Thailand | Viet Nam |
| 710812       | 6.61%      | 17.25%  | 0.00%     | 36.13%   | 2.31%        | 28.51%       | 1.72%    | 0.00%    |
| 310210       | 3.56%      | 0.00%   | 68.28%    | 20.35%   | 0.00%        | 6.57%        | 0.00%    | 2.57%    |
| 390210       | 1.14%      | 27.20%  | 4.67%     | 2.64%    | 1.00%        | 56.54%       | 1.30%    | 3.56%    |
| Jordan       |            |         |           |          |              |              |          |          |
| Product Code | JOR Export | Brazil  | China     | Mexico   | Mozam-bique  | South Africa | Thailand | Zimbabwe |
| 251010       | 5.25%      | 0.00%   | 10.39%    | 0.00%    | 37.76%       | 6.88%        | 0.00%    | 42.46%   |
| 280920       | 2.69%      | 0.08%   | 91.08%    | 0.12%    | 0.00%        | 8.63%        | 0.09%    | 0.00%    |
| 300390       | 2.48%      | 1.83%   | 89.18%    | 0.15%    | 0.00%        | 4.11%        | 1.35%    | 0.00%    |
| 710812       | 1.69%      | 17.25%  | 0.00%     | 2.31%    | 0.00%        | 28.51%       | 1.72%    | 0.00%    |
| 340290       | 1.08%      | 31.99%  | 54.10%    | 6.27%    | 0.00%        | 2.10%        | 2.08%    | 0.00%    |

Source: UNSTAT- UN Comtrade via WITS (by TradeSift).



## II.8. Main conclusions and recommendations

This chapter shows that a number of factors (such as the increase in the price of international transport or, in a more structural way, large companies making decisions based on risk management and the increasingly obvious environmental concerns expressed by both consumers and the financial markets) will encourage firms to both diversify their sources of supply and shorten GVCs. In this context, we sought to identify the common products for which there are opportunities for European companies to substitute part of their purchases of intermediate goods imported from distant countries with Mediterranean products.

The methodology we developed allowed us to determine the list of intermediate common goods for each of the four SEMCs. This includes 535 products for Morocco, 505 for Tunisia, 428 for Egypt and 450 for Jordan. These lists correspond to intermediate goods imported by the EU from distant countries (beyond 7,000 km from Belgium) and also exported by the Mediterranean country concerned, based on average imports and exports between 2017 and 2019.<sup>61</sup>

The added value of this work resides in the demonstration that there are very real opportunities for European companies to import from SEMCs, at least in part, the intermediate goods they import from distant countries having similar level of development

as the SEMCs. The purpose of this analysis was to identify these goods.

For the SEMCs, these opportunities can boost their exports to the EU and also represent an incentive to increase their production of intermediate goods (in particular, those listed above) and to increase domestic and foreign investments in those industries, particularly from the EU. As detailed below, if the phenomenon of shortening value chains becomes effective, we can also expect foreign direct investment from Chinese companies.

Although this work is not intended to lead to policy recommendations per se, it yields a number of lessons:

- The first is that even when SEMCs know how to produce and export a product, with a high comparative advantage, this product can be almost entirely, or even totally, imported from China in the European market. For most intermediate goods considered important in the exports of SEMCs, Chinese products not only dominate the European market but have completely taken it over, with China almost becoming the sole supplier. Beyond the supremacy of Chinese intermediate goods, there is also the question of which specific companies are competing with Mediterranean products in the most significant industries in Med countries. It is indeed possible that in some sectors there has been a significant concentration of coming from distant countries.

<sup>61</sup> Thus, there will be very little variation if the updated data for 2020 is taken into account. However, since this work is based on observed trade flows, it is impossible to predict the future needs of European companies for intermediate goods..

- The second is that, as mentioned in the first part of this chapter, the EU could initiate a large-scale re-shoring policy by including the neighboring countries and, in particular, the SMECs. Such an industrial regionalization initiative involving Europe and its neighbors would be beneficial to all. In the perspective of the African Continental Free Trade Area (AfCFTA), it would also bear the advantage of better positioning European companies with regard to Sub-Saharan African markets.
- The third is that it would be in everyone's interest (security, risk reduction, better product quality control for European companies and increased competitiveness for Mediterranean companies) to promote the establishment of sustainable relations between European multinationals and companies in the SMECs, including forms of direct investment that empower and involve both parties, such as co-production models. We also know that the creation of eco-systems around the multinationals that set up shops optimizes the possibilities of positive external effects on the entire local economic fabric.
- The fourth is that it is in the interest of Mediterranean countries to pursue a very active communication policy with the European private sector to promote their production capacities for the products and main industries identified in this chapter. This communication policy could be supported by the EU and other international organizations (CMI, EBRD, OECD, etc.).
- The fifth is that, despite the current economic and social difficulties following the pandemic, the SEMCs must enhance their efforts to improve their productive capacities, especially their competitiveness and, on the other hand, their "absorption capacity". This includes the effectiveness of their training systems, the quality of their infrastructure, access to financing and, more generally, the business environment, to enable them to benefit fully from the positive effects of foreign investment.
- The sixth is that, in this context, we can expect Chinese companies to invest and settled in SEMCs to satisfy the dual need for shortening and diversification of European suppliers. For this strategy, which could be followed by Chinese multinationals, to have a ripple effect on the Mediterranean economies, it is in the interest of decision-makers to include conditions in their investment framework that will ensure the transfer of technology and know-how between foreign companies and the economic fabric of the host country (companies, human capital, research laboratories, as well as specific local job creation targets).
- The seventh is that it would be interesting to extend this analysis by trying to understand why European companies have preferred to buy intermediate goods from distant countries, while these same products are manufactured and exported by Mediterranean countries. It is

possible that beyond a number of common beyond production costs and tariffs, such as laws and regulations, business climate, and logistics, industry-specific reasons may appear. Another possible extension would be to apply this analysis to regional trade in order to identify intermediate goods imported by Mediterranean countries from distant countries (or more broadly from the rest of the world), while they are to the world by one of them.

- Finally, this first study on the identification of sectoral opportunities that have emerged following the pandemic crisis could be used as a first step by local actors (political decision-makers, managers of business support organizations, representatives of sectoral trade unions, etc.) to develop a strategy that will make the most of the opportunities to increase production of the 400 or 500 products identified per country and to encourage exports of the most important products.

## References

- Augier, P., V. Castel & T. El Malki (2019), Identification des obstacles à l'intégration dans les chaînes de valeur mondiales des PME marocaines, Femise Rapport Euromed, Sept.
- Baldwin, R. & R. Freeman (2020), The Covid concussion and supply-chain contagion waves, VoxEU.org, Avril.
- Banque Européenne pour la Reconstruction et le Développement (2020), Régional Economic Prospects: Covid-19, from shock to recovery, London, Avril.

## Chapter 3. The Health Sector in the Mediterranean in the face of the Covid-19 Crisis: Challenges and Opportunities

*Sami Mouley, Constantin Tsakas and Bruno Ventelou*

### Key points of the Chapter

- The situation of health systems in the Mediterranean countries covered by this study (Algeria, Egypt, Jordan, Morocco and Tunisia) is characterized by a number of weaknesses, including a two-tier system, major shortages (lack of hospital beds, intensive care places, ventilators, human resources, etc.), a rigid and highly centralized public system, a lack of preventive care and health monitoring capacity, and finally poor social protection.
- The structural weaknesses of the health systems reduce their capacity to cope with the Covid-19 pandemic.
- A better response to epidemics relies on improving these health systems, which requires decentralization and the development of primary care, the setting up of partnerships with the private sector, free care (or at least the extension of health insurance mechanisms), regional cooperation, including the sharing of good practices, and international cooperation in conjunction with the WHO.
- Digitalization can potentially contribute to improving health systems, by reducing the negative effects of the strong centralization and pyramidal organization of health systems in these countries, by allowing better prevention and monitoring of chronic diseases and by providing access to all medical data, in particular those concerning patients' medical records.
- However, given the existing conditions in the Mediterranean countries, widespread use of digital technology cannot be envisaged in the short term. Its use is confronted with numerous difficulties that are both "technical" (insufficient technological infrastructure, bandwidth congestion, etc.) and "socio-economic" (poverty, illiteracy, rejection of new technologies for certain types of use, etc.).
- A focus on the pharmaceutical industry shows that it should constitute a priority sector in the five Mediterranean countries. Their production capacities in this industry have developed strongly over the last few years mainly thanks to foreign direct investment (FDI).
- The pandemic crisis has highlighted the vulnerability of global supply chains and the heavy dependence on China in particular, as well as on India, including for products needed to fight Covid-19. This awareness can benefit the countries of the Mediterranean region due to their geographical and cultural proximity to Europe, the relatively lower cost of production factors than in Eastern European countries, existing production capacities, the presence of multinationals and the skills acquired in the pharmaceutical field.

In this chapter, the first section looks at how the health systems of five countries in the Mediterranean region (Algeria, Egypt, Jordan, Morocco, and

Tunisia) have reacted to the Covid-19 crisis. This analysis highlights the main weaknesses of these countries' health systems, but also attempts to

consider which features of the systems can be built upon to increase their resilience, improve the quality of their response to the Covid-19 health crisis - or to possible future pandemics - and build fairer and more effective health systems.

The second section looks at the capacity of digital technology to improve health systems and make them more efficient, particularly by addressing the main weaknesses that have been highlighted. Even if the countries in the region have not reached the same level of progress in terms of digital equipment, they are all concerned by what could be described as the “digital paradox”. Digital technology can be a potential tool for improving health systems and the well-being of populations, but it can also be a source of increased inequalities and worsened dysfunctions.

The third section focuses on the pharmaceutical industry and shows why the context of the pandemic may offer new perspectives for the development of this sector.

## I. The health systems of five countries in the Mediterranean faced with Covid-19: What are the weaknesses? What improvements can be made?

**Bruno Ventelou** (Aix Marseille University, CNRS, AMSE, Marseille, France & Regional Health Observatory, PACA)

On 11 March 2020, the WHO declared the Covid-19 epidemic a “pandemic”.

Covid-19 is a new airborne, contact virus belonging to the coronavirus family. It has affected almost every country in the world, and the Mediterranean region has not been spared. This disease poses two major challenges to all health systems, both in the most advanced countries and in emerging countries. The first is the capacity to provide patients with curative care: the large number of severe cases of the disease, which require intensive care, sometimes for several weeks, calls for the exceptional mobilization of new resources and numerous reallocations, mainly within the framework of hospital structures.

The second - but which ought be the first! - is the ability of health systems to offer a rapid response in the field of epidemic prevention, with adapted, upstream strategies aiming, to avoid the spread of infection. This second dimension is often overlooked, as it is too quickly assumed to be the responsibility of society as a whole rather than that of the health system. However, healthcare professionals hold responsibilities regarding public and disease prevention, even if this mission has been somewhat overlooked in recent years.

In opposition to the current major cycle of the “chronification of health problems”, the Covid-19 crisis has brought the emphasis back to one of the primary functions of health systems: the fight against infectious diseases. The movement towards “chronification” unfolded from the mid-1970s to 2019, the last year in which Abdel Omran spoke of an epidemiological transition. Omran



(1971)<sup>62</sup> formulated this theory in 1971 to explain the shifts in leading causes of mortality within a population over time: the development and modernization of human societies have contributed to an improvement in hygiene and diet, which in turn has an impact on the risk of disease; infectious diseases are thus gradually disappearing while there is a rise in chronic and degenerative diseases, which are not transmissible. From 1970 to 2019, health systems were ordered to adapt and keep pace with this trend<sup>63</sup>; particularly in the Maghreb countries, where the development of chronic diseases was extremely rapid (metabolic diseases such as diabetes<sup>64</sup>). Even AIDS, the last major infectious disease, shifted to a “chronic” status with the advent of ARVs and the survival associated with these treatments (between 1990 and 2010, the focus was no longer how to prevent the epidemic from spreading but how to care for patients<sup>65</sup>). The Covid-19 crisis brought this trend to an abrupt end. We must now find ways to counter a communicable, brutal and deadly disease.

All health systems and their decision-makers were caught unaware by this

infectious disease, which is relatively normal given its severity and rapid spread. However, some systems were able to make the necessary adjustments to cope with the Covid-19 pandemic with relative ease, demonstrating what is known as good ‘resilience’<sup>66</sup> while others had more or less dismantled the epidemic monitoring and management systems in order to concentrate on chronic diseases (we will return to this point in section 1), making them vulnerable in a number of areas. When confronted with the Covid crisis, they had tremendous trouble achieving the 180-degree turn-around back to an epidemic management and public health model that focused on contagious disease control.

This chapter looks at how the health systems of Algeria, Egypt, Jordan, Morocco, and Tunisia responded to the Covid-19 crisis and were able, or unable, to provide a satisfactory response to the pandemic. This section highlights the main health systems weaknesses of these countries, but also attempts to consider what features of their health systems can be built upon to increase resilience and improve responses.

62 Omran, A. R. (1971). The epidemiologic transition: a theory of the epidemiology of population change. *The Milbank Memorial Fund Quarterly*, 49, 509-538.

Caldwell, J. C. (2001). Population health in transition. *Bulletin of the World Health Organization*, 79, 159-160.

63 Some authors have warned, however, that the epidemiological transition is not equally distributed around the world and that, for the time being, many countries have not emerged from the infectious disease phase. For example Sanders et al. (2008). The epidemiological transition: the current status of infectious diseases in the developed world versus the developing world. *Science Progress*, 91(1), 1-37. In terms of viral epidemics, Ebola for example is a recurrent problem.

64 Murray et al (2020). Global burden of 87 risk factors in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet*, 396(10258), 1223-1249.

65 Colvin, C. J. (2011). HIV/AIDS, chronic diseases and globalization. *Globalization and health*, 7(1), 31.

66 Thomas et al (2020). Strengthening health systems resilience: Key concepts and strategies [Internet]. Copenhagen (Denmark): European Observatory on Health Systems and Policies; 2020. PMID: 32716618.

## I.1. Weaknesses of health systems in the region

### Weakness 1. The two-tier health system

The term two-tier health system refers to a health system that is primarily organized around a public healthcare system, which claims to guarantee access to care for all citizens, while a parallel system allows a certain minority to buy better quality care, more quickly and often in a more pleasant environment. This kind of two-tier organization is very common in developing countries<sup>67</sup>, but it is not unique to them - for example the British, or even Canadian, systems are sometimes described as such. Very often, the backbone of the public system is provided by a network of national hospitals (whose staff are salaried, mostly civil servants), while the parallel system is of a private nature (with staff paid on a fee-for-service basis, organized in practices or clinics). It should be stressed that in most Mediterranean countries, doctors are able to participate in both systems, which can pose a problem of their loyalty to the public system, with i) absenteeism ii) embezzlement (public resources diverted to private practices) iii) a lack of transparency for the patient, who does not even know which system he/she is being treated in (even after a consultation in a public hospital!), with costs to be paid that can exceed the tariff officially set in the framework of the public health policy.

All in all, for these countries, this two-track system is associated with a general problem of care quality in the public health system (waiting lines, lack of suitable technological means); it also leads to a specific problem regarding the topic of concern: the rapid and effective control of a health crisis stemming from an infectious disease. On Egypt, for example, we may read<sup>68</sup> the following: The decline in the State's role in spending on the health sector and the maximization of the role of private hospitals have caused a major crisis after the outbreak of the Covid-19 epidemic in Egypt, because the Ministry of Health was unable to impose a fixed price for treating citizens infected with Covid-19 on these hospitals. Moreover, private hospitals threatened the Ministry of Health that they would stop providing the service in the event that a compulsory price would be imposed on the medical service that they provided related to the Covid-19 patients.

In fact, in the context of the Covid-19 health crisis, one might think that patients in need of urgent care were not served in the same way depending on whether they were "prisoners" of the public health care system or, on the contrary, were sufficiently wealthy to access the private system (the Moroccan press<sup>69</sup> noted the same thing as that reported above in Egypt). Inequalities in access to care can emerge rapidly; and during an epidemic, any delay in diagnosis and/or lack of care acts as a vector of the epidemic, as we shall see later.

67 Mathonnat, J. (2009). *Système de santé et accès aux soins dans les pays à faible revenu* (pp 495-506), in Bras P.L., Tabuteau G., Pouvourville G., *Traité d'économie et de gestion de la santé*, Presses de ScPo, Paris.

68 <https://en.eipss-eg.org/post-covid-19-how-to-reform-egypt-health-system/>

69 LeDesk, En Clair, dispatch on 26.03.2020.

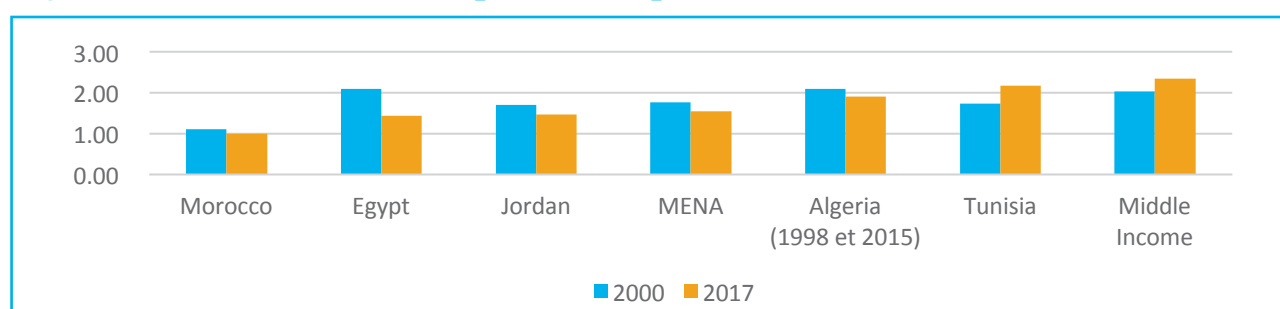
## Weakness 2. Shortages in public systems for treating Covid-19 and other diseases

### The insufficient infrastructures, underfunding and inflexibilities

Public hospitals in all five countries suffer from underinvestment due to tight public budgets over the past decades. This is the case, for example, for the criterion: number of hospital beds per 1,000

inhabitants (Figure III.1<sup>70</sup>) in Algeria (1.9 beds), Egypt<sup>71</sup> (1.43), Jordan (1.47) and above all in Morocco (with only 1 hospital bed per 1,000 inhabitants). The number of beds fell throughout between 2000 and 2017, with the exception of Tunisia, which is the only country among the five with a number of beds exceeding 2 per 1,000 inhabitants in 2017 and which is closer to the average for middle-income countries (2.34).

Figure III.1. Number of hospital beds per 1,000 inhabitants, 2000 and 2017

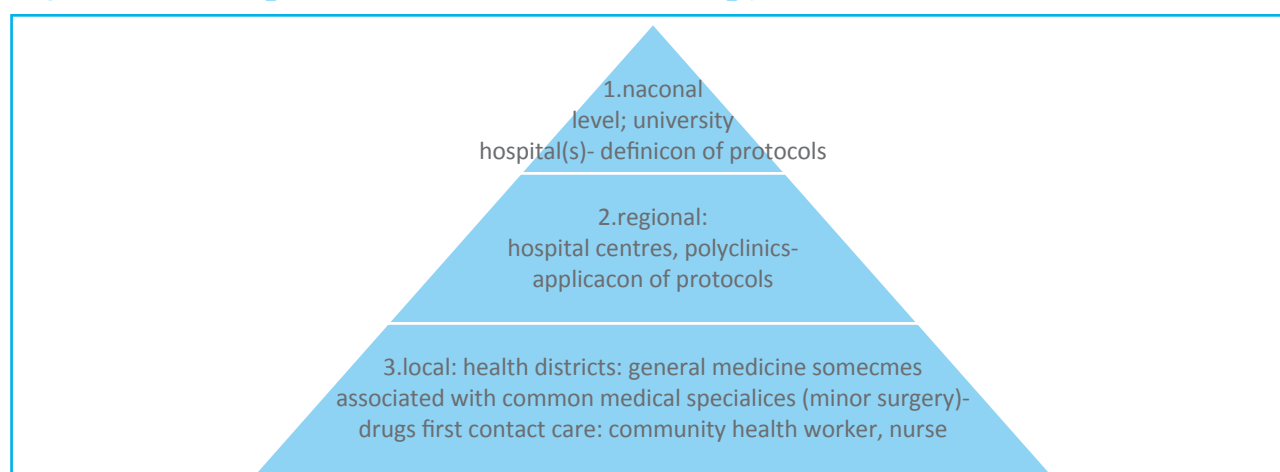


Source: WDI, World Bank.

Another problem is the severe inflexibility of the public system with the extreme centralization of hospitals around the capital cities. The “health pyramid” model (see Figure III.2) is

generally applied in these countries, with a national “university” center that decides on protocols and tries to decentralize them to the various local levels of the territory.

Figure III.2. Representation of the health pyramid



Source: authors.

70 To give an order of magnitude the figures are around 5 in Europe. Countries with a comparable age structure generally have figures above 2 (in Asia).

71 In Egypt, for example, some hospitals are known to be closed for ten years for replacement, renewal or reconstruction (Walid Salam, April 4, 2017, Hospitals inhabited by neglect. 186 hospitals out of service for maintenance or reconstruction, Al-Bawaba News).

This cumbersome and complex structure, typical of the familiar “top-down” system of the State in the twentieth century industrial era, is often associated with bureaucratic red tape and a lack of flexibility and/or reactivity. This is particularly true for remote regional levels, which are the last to be served when new resources need to be deployed (e.g. equipment to protect against the epidemic: masks, gloves, used for medical examinations, etc). In Algeria, the Pasteur Institute of Algiers was the only one authorized to carry out Covid-19 PCR tests at the beginning of the health crisis, although it was unable to meet the needs. In Tunisia, according to recent data<sup>72</sup>, health structures are unevenly distributed; for example, 13 of the 24 governorates have less than one intensive care bed per 100,000 inhabitants, reflecting the marginalization of the southern and central regions.

### **The problematic shortage of intensive care units and ventilators**

Beyond the overall hospital infrastructure, there is a need to look in detail at the provision of intensive care beds, which accommodate Covid-19 patients in respiratory distress. Data on intensive care and resuscitation beds are not well reported, but it appears that countries in the region are poorly

equipped. Egypt is reported to have 5,600 intensive care beds and 4,000 ventilators<sup>73</sup>. The Minister of Health<sup>74</sup>, confirmed that the occupancy rate of ventilators in Cairo would reach 97% by June 2020. The Egyptian Medical Syndicate has called for an initiative to cover the shortage of intensive care units and ventilators<sup>75</sup>. In countries such as Morocco or Algeria, there are between 2,000 and 3,000 ventilators<sup>76</sup>.

The treatment of severe forms of Covid-19 also requires the availability of protective equipment, notably masks and surgical gloves. This raises the question of supply on the international markets. The “requisitions” of many highly influential states (which, according to Doctors without Borders “can turn into a grabbing reflex”<sup>77</sup>) make it difficult for lower income and less influential countries to access the supply chain.

### **Lack of human resources**

As with infrastructure, the countries in the study generally suffer from a chronic deficit in human resources for health. The doctor/inhabitant ratio is very low in Morocco and Egypt (less than 1 doctor per 1,000 inhabitants), slightly higher in Tunisia (1.3, i.e. around the MENA average and the average for countries with comparable incomes); it is higher in Algeria (1.79)

72 Tunisian Republic, Ministry of Health. Carte sanitaire Année 2015. Tunis: Ministry of Health; 2016.

73 <https://en.eipss-eg.org/wp-content/uploads/2020/09/Post-COVID-19-How-to-Reform-Egypt-Health-System.pdf>

74 Hala Zayed, Minister of Health, Egypt.

75 Egyptian Medical Syndicate (EMS), quoting Al-Masry Al-Youm, February 6, 2020, Head of EMS Hussein Khairy: We need a presidential initiative to support intensive care units and incubators.

76 <https://www.jeuneafrique.com/924087/societe/nombre-de-lits-de-reanimation-et-de-respirateurs-ou-en-est-lafrique>

77 <https://www.msf.fr/eclairages/covid-19-les-systemes-de-sante-a-l-epreuve-de-la-pandemie>.

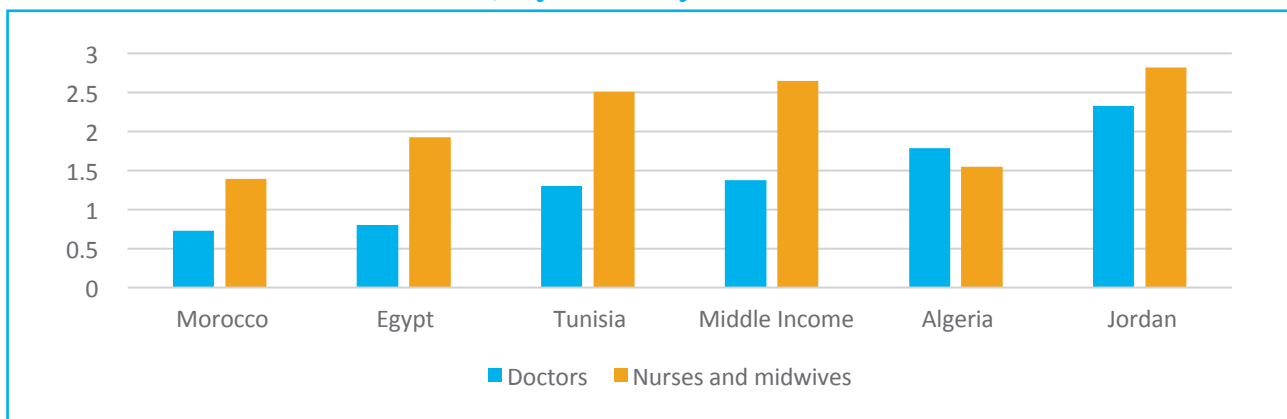


and above all in Jordan (2.32) (cf. Figure III.3), but remains far from Western ratios (4 to 5 doctors per 1,000 inhabitants). With regard to doctors, health systems have to deal with two major issues: the international migration of health personnel (brain drain) and the attractiveness of the private sector<sup>78</sup>. The Covid-19 crisis has once again brought to light specific difficulties, demonstrating a real shortage of certain specialists such as anesthetists (a shortage noted by the press in countries such as Egypt or Morocco).

The nurse/inhabitant ratio (and midwife/inhabitant) is generally

slightly better, but the countries ratios remain below 3. On average, the world has 2.8 nurses and midwives per 1,000 inhabitants, which corresponds to the ratio in Jordan, the highest of the five countries. In contrast, there are only 1.39 nurses and midwives per 1,000 inhabitants in Morocco, 1.55 in Algeria, 1.93 in Egypt and 2.51 in Tunisia (see Figure III.3). The proper deployment of these resources, i.e. putting them in the right place and for the people who need them most, is also an important challenge, and again the dual system (defined in the first part of this chapter) does not guarantee that this is achieved.

**Figure III.3. Number of doctors and nurses/midwives per 1,000 inhabitants in 2017 or 2018, by country**



Source: WDI, World Bank.

### Weakness 3. Curative vs. preventive: absence of the preventive component including care provision for other diseases

This weakness is not unique to the region. We know that many health systems are excessively oriented towards curative measures and insufficiently towards prevention. The Covid-19 crisis has merely confirmed this blind spot in world

health policy: many countries have been unable to organize the prevention of the epidemic's spread - other than by resorting to the brutal strategy of containment. Only the best organized countries have been able to use their health services to combat the reproduction of the epidemic: implementation of diagnostic tests; information for patients in general; information and protection for patients most at risk; contact tracing. The

<sup>78</sup> Aggregate medical density figures can also be misleading when many doctors choose a mixed practice, and spend a lot of time in private clinics, for a few hand-picked patients, and little in public hospitals, attending to the general population.



prerequisite for the implementation of these approaches is the existence of a primary care medicine system that is responsible for “community” missions<sup>79</sup> and is well distributed over the territory, while having a substantial response capacity. Few countries have been able to boast such primary care organizations that would have helped them to respond effectively to Covid-19 (many Western developed countries have not fared well either, despite their relative economic affluence). But the chronic lack of primary care physicians and the general neglect of prevention in Mediterranean countries (for which both patients and physicians are responsible) further increases the insufficiency in the region. It should be added that this lack of prevention will most likely cause what is known as the Covid-19 “time bomb”: the explosion of problems stemming from other diseases (metabolic disease, cancer, mental illness), which during the Covid-19 crisis will have suffered from an absence of diagnosis and treatment. This backlash has already been identified in more advanced countries<sup>80</sup>.

Another particular weakness in the field of prevention, within Mediterranean countries, is the deterioration of their

institutions engaged in the fight against epidemics<sup>81</sup>, in line with the logic mentioned in the introduction of the (false) “epidemiological transition” in favor of chronic diseases. We find, in particular, health information and surveillance systems that are insufficiently updated to benefit from the opportunities provided by the latest technological advances in this field (see section 2). Epidemic information systems, in the countries best equipped in this respect, now use digital devices that allow real-time surveillance and feedback, based for example on hospital admissions or cases observed in private practices. The effectiveness of the ‘test - treat - alert’ strategy depends on this system to fight and rapidly curb the epidemic responsible for infectious outbreaks.

#### Weakness 4. The limited development of health insurance and social protection in general

The fight against the pandemic has also suffered from the lagging development of universal health coverage. The virtuous links between social protection systems and a country’s ability to fight the spread of an infectious disease are very clear: firstly, the prophylactic isolation of the sick (quarantine) and the tracing of

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79 In English, the term community medicine is used. This term has been included in the keywords of the MeSH database since 1977. It is defined as: A branch of medicine concerned with the total health of the individual within the home environment and in the community, and with the application of comprehensive care to the prevention and treatment of illness in the entire community. Community medicine is based on prevention and the organization of care, in outpatient and family medicine. It is institutionally recognized in Anglo-Saxon countries, in European states (Northern Europe) and in other French-speaking countries, such as Switzerland and Canada.

80 Mercier, G., Arquizan, C., & Roubille, F. (2020). Understanding the effects of COVID-19 on health care and systems. *The Lancet Public Health*, 5(10), e524.

81 Example: the Centers for Disease Control and Prevention (CDC in the United States); the Pasteur Institutes.

contact cases are logically conditioned by a diagnostic test when patients seek care for their first symptoms. However, when care is too expensive for families (large out-of-pocket payments and poor reimbursement mechanisms), patients are likely to delay seeking care, or even forego it, making it impossible to carry out health surveillance and control. Free diagnostic tests are also recommended by the United Nations<sup>82</sup>. Free testing is consistent with the idea of a “public good”, because information on diagnostic status is of collective value, serving both the individual and the community.

Issues surrounding the cost of diagnosis are compounded by the cost of medical treatment (already documented in AIDS when antiretrovirals were unaffordable); what is the point of being diagnosed if the cost of treatment is unaffordable? Health insurance mechanisms are therefore an integral part of the strategy to fight a pandemic. From this point of view, the five countries under consideration are variously advanced on the road to universal health insurance: Egypt and Morocco are singularly behind, with less than 45% of expenditure covered by a collective care mechanism and payment from private resources of around 60% of health expenditure in Morocco and more than 70% in Egypt (see Table III.1). In Tunisia, Jordan and Algeria in particular, there is better collective coverage of health costs (60% for Tunisia, almost 67%

for Jordan and a little over 69% for Algeria), but this remains far from being a universal protection system. Universal Health Coverage (UHC) is nevertheless an objective of the Sustainable Development Goals (SDGs) for 2030<sup>83</sup> (goal 3.8).

Also, the health insurance institution(s) as such, independently of their main financial mission, are sometimes involved in “risk management”, with participation in reporting on the health crisis, facilitating rapid access to treatment, and even supporting policies to prevent people’s exposure to the virus (warning messages, messages to improve behavior). The poor development of health insurance in some of the countries under consideration (notably Egypt) prevents these actors from being equally active, alongside the ministries, in managing the epidemic.

Finally, beyond the coverage of direct health expenditure, it should be pointed out that other aspects of social protection are also important in combatting the epidemic. In the event of a confirmed outbreak, the withdrawal of the sick from their workplace, whether this concerns formal work (a company) or informal work (markets, souks, etc.) during the infectious phase helps to limit disease propagation. Good compensation for lost days avoids “presenteeism”; but such generosity is unfortunately not appropriate in countries where informal work accounts for more than half of the country’s jobs.

82 See [sg\\_policy\\_brief\\_on\\_universal\\_health\\_coverage.pdf](#)

83 <https://sdgs.un.org/fr/goals>

**Table III.1. Indicators on the coverage of health costs**

|                           | Share of public or prepaid health expenditure, % <sup>84</sup> | Private health expenditure (% of total health expenditure) |
|---------------------------|--|--|
|                           | 2017   | 2018   |
| Algeria                   | 69.1%  | 34.1%  |
| Egypt                     | 39.6%  | 70.6%  |
| Jordan                    | 66.9%  | 46.3%  |
| Morocco                   | 44.4%  | 59.6%  |
| Tunisia                   | 60.6%  | 42.2%  |
| MENA                      | N/A  | 43.2%  |
| MENA (Except high income) | N/A  | 53.1%  |
| Middle Income Countries   | N/A  | 47.6%  |

Source: WDI, World Bank.

## **I.2. Solutions to improve health systems in the region**

### **Decentralization and development of primary care**

In the face of infectious diseases, testing and vaccination campaigns are better implemented when they are organized by local actors who understand the populations' priorities, fears and needs, than when they are steered "from afar" by the country's central university hospital. In general, the Covid-19 epidemic has reinforced the validity of the primary care paradigm<sup>85</sup>. When

vaccines become available, they should be dispensed by the primary care system (rural health units, non-hospital treatment), which is flexible and able to adjust. In the case of Egypt, we may read the following: The overall structure of the health services in Egypt is good in terms of geographical covering by primary healthcare units both in the rural and to some extent in the urban areas. Most of the villages are covered by rural health units; primary healthcare units are covering a large number of population in the major cities and towns.<sup>86</sup>

84 Dieleman et al. (2017). Future and potential spending on health 2015–40: development assistance for health, and government, prepaid private, and out-of-pocket health spending in 184 countries. *The Lancet*, 389(10083), pp. 2005-2030. The percentage figure includes any community or private health insurance schemes that operate on a pre-paid basis.

85 Defined by the World Health Organization (WHO) in Alma Mata more than 40 years ago (1978), primary health care ("first line of care") was recently reaffirmed by the Astana Declaration in 2018 as the cornerstone of all health systems.

86 Kamel, M. I. (2020). A view of the health services after COVID-19: An Egyptian perspective. *Alexandria Journal of Medicine*, 56(1), 118-129.

Moreover, decentralized health service operators are organized as an open system, as in Europe, where there are several standard models of primary care, some of which make extensive use of the private sector<sup>87</sup>.

In Algeria, the territorial network of access to health care is already organized on the principle of complementarity between public actors and the private sector (although a very recent study shows that this complementarity does not work smoothly), leaving some departments -Wilayas- with severe problems of access to care<sup>88</sup>.

In general, the resilience of internal actors in public health systems (public sector health workers, who are called upon to adapt and absorb the shock of the epidemic) is, in our view, strongly determined by the extent to which all external partners are mobilized: local authorities, community actors, families, and of course private sector health professionals. This leads to our second point below.

### **Partnerships with the private sector**

Generally speaking, this second solution amounts to using the opponent's weight, as in judo. In the context of a two-tier system, the private sector and

the dynamics it can offer should be exploited to a greater extent, both in terms of rapid response to critical care needs and urgent vaccination, and in terms of a more considered approach to long-term disease prevention. For example, the network of pharmacies can provide an ad hoc national service for a large-scale vaccination campaign<sup>89</sup>. Rural health centers and general practitioners can also take on the task of both informing patients about the epidemic and maintaining the follow-up of chronically ill patients (who vanished from hospitals during the crisis<sup>90</sup>). There are around 7,500 private General Practitioner (GPs) in Algeria, 5,000 in Morocco and 6,500 in Tunisia; these doctors can help to improve the coverage of the territory and offer an additional response capacity in the event of a health crisis, particularly during the “waves” of the epidemic. However, there is a need to assign preventive public health missions to private sector doctors in order to direct them towards a more community based medicine, as discussed above.

### **Responding to demands, particularly to promote vaccination**

Where the private sector is used, the issue of access price is essential. In the

87 In Europe, a distinction is made between: a) The hierarchical normative model: a system organized around primary care and regulated by the State (Finland, Sweden); b) The hierarchical professional model: the general practitioner as the pivot of the system (United Kingdom, Netherlands); c) The non-hierarchical professional model: organization of primary care at the initiative of local private actors (Germany, Canada, France).

88 Zehnati A. (2021), Dynamics of the geographical distribution of private physicians in Algeria. *Cybergeog: European Journal of Geography*, pp. 1-24.

89 Deslandes et al. (2020). Community pharmacists at the heart of public health: A longitudinal evaluation of the community pharmacy influenza vaccination service. *Research in Social and Administrative Pharmacy*, 16(4), 497-502.

90 Phenomenon observed in France, for example. Mercier, G., Arquizan, C., & Roubille, F. (2020). Understanding the effects of COVID-19 on health care and systems. *The Lancet Public Health*, 5(10), e524.



absence of properly developed health insurance, it is probably necessary to urgently consider systems where care is provided free of charge at the point of access for which health care providers would be provided with direct compensation. Also, in the short term, we think that States should intervene on the supply of care, by contracting with the providers for access to free Covid-19 care (activation of a vertical emergency program). In the longer term, it will be necessary to strengthen health insurance systems, in order to include a wide range of pathologies in the system of universal coverage.

One can debate the interest of free health care in general, for all diseases<sup>91</sup>. Indeed free care for contagious diseases is fully in line with the notion of “positive externality” in the economic theory of public goods. Individual prevention tests and information are valuable to all; they allow monitoring of the epidemic and rapid action on clusters. Above all, the vaccine is typically a good that must be subsidised, as its social “utility” surpasses the interest of a single individual through many mechanisms<sup>92</sup>, the main one being that a vaccinated person is no longer a vector of the pandemic within the community. This is the case for most vaccines. At the present time, none of

the Covid-19 vaccines in development have demonstrated this property.

### **Regional cooperation and sharing of good practice**

Buying vaccines from Northern laboratories will be expensive for lower income countries. The international community should commit to working with the poorest countries to purchase large volumes of vaccines (COVAX initiative<sup>93</sup>, supported by GAVI). But cooperation between the countries of the Mediterranean region can play a key role, possibly as a complement. A solution already advocated in the context of HIV antiretrovirals could provide inspiration: the organization of powerful and well-informed central purchasing units (on products and their prices) would be a more effective counterweight to the laboratories, through the market share represented by regional grouping; this is known as “procurement strategy”<sup>94</sup>. This coordinated procurement strategy also seems to have been implemented by the European Union for the Pfizer/BioNTech vaccine. Working towards liberalizing the patents of these vaccines to be used by laboratories in lower income countries would constitute the best solution to make them available for vulnerable populations, always under the notion of “public good” at the global level.

91 Ridde, Valery. 2004. L'initiative de Bamako 15 ans après - un agenda inachevé (French). HNP discussion paper Washington, D.C. : World Bank Group.  
<http://documents.worldbank.org/curated/en/417091468763473890/Linitiative-de-Bamako-15-ans-apres-un-agenda-inacheve>

92 Bloom, D. E., Canning, D., & Weston, M. (2005). The value of vaccination. *World Economics*, 6(3), p 15.

93 <https://www.who.int/fr/news/item/21-09-2020-boost-for-global-response-to-covid-19-as-economies-worldwide-formally-sign-up-to-covax-facility>

94 Camara M, D'Almeida C, Orsi F, Coriat B. Procurement Policies, Governance models and availability of ARVs in some African Francophone countries. In: Coriat B, Ed, *The Political Economy of HIV/AIDS in developing Countries TRIPs, Public Health Systems and Fee Access*. Edward Edgar Publisher, London, 2008, 225-54.



In terms of regional cooperation, health services can also coordinate, not to exchange patients as has been the case between European countries<sup>95</sup>, which would not be realistic for the Mediterranean region, but to exchange good practices in the framework of cooperation between professionals. For example, 15 French-speaking African countries have created an emergency care organization called the African Francophone Society of Emergency Medicine (Société africaine francophone de médecine d'Urgence<sup>96</sup>). Exchanges on medical practices are much more relevant when they take place between countries with the same level of economic constraints and with populations of similar culture.

Finally, it would be even better to promote exchanges of good practices in policy-making, with coordinated national strategies to fight Covid-19, borrowing from those that have demonstrated the most effectiveness, always taking into account the constraints of the countries. The size of the informal sector, for example, makes it very difficult to apply strict containment, making it impossible to borrow from solutions found in the North. In particular, lessons from population-based research can be shared. Attitudinal surveys on populations (Knowledge Attitudes,

Behavior and Practices<sup>97</sup>), dedicated to Covid-19, are likely to be shared between the French-speaking countries of the zone, whose populations have more or less the same sources of information and similar cultural functioning; which, in all likelihood, should produce the same attitudes to Covid-19 and to the prophylactic measures for this pandemic. Policy-making, especially information campaigns, can therefore be based on intra-regional exchanges within each of the sub-regions of the MENA region, namely the Maghreb (North Africa), the Mashreq (Levant) and the Gulf, as they have more homogeneous health systems and demographics<sup>98</sup>.

Whatever the intra-regional dimension chosen, any cooperation activities should be set up to operate at different levels: pooling of scientific studies; scaling up best practices in the fight against the epidemic; coordinated purchase of vaccine stocks, selecting them according to their suitability for the country's needs and conditions (competition between laboratories in terms of price and quality of vaccine products).

## 5/ Regional cooperation

The countries under consideration are members of the WHO, with the WHO Regional Office as the nearest point

95 Albeit anecdotally.

96 See: Santé mondiale et soins d'urgence : un programme de recherche sur la réanimation. Part 1 (who.int).

97 Zhong et al. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. *Int J Biol Sci* 2020; 16(10), 1745-1752.

For KABP in Morocco, for example: Tachfouti et al. The impact of knowledge and attitudes on adherence to tuberculosis treatment: a case-control study in a Moroccan region. *Pan Afr Med J.* 2012, 12-52

98 Sawaya et al. (2020). Coronavirus Disease (COVID-19) in the Middle East: A Call for a Unified Response. *Frontiers in Public Health*, 8.

Blair I, Grivna M, Ahmad Sharif A. The "Arab World" is not a useful concept when addressing challenges to Public Health, Public Health Education, and Research in the Middle East. *Front Public Health.* (2014) 2-30 10.3389/fpubh.2014.00030.

of support. The Regional Office serves the Eastern Mediterranean Region and includes 21 Member States and Palestine (West Bank and Gaza Strip). In terms of epidemic control, they have signed the International Health Regulations of 2005, updated in 2016. In addition to the dynamics of the Covid-19 epidemic, the office places great emphasis on mental health and domestic violence. The WHO regional office had also developed an “Eastern Mediterranean Vaccine Plan”<sup>99</sup> which was endorsed in October 2015 by the Eastern Mediterranean Regional Committee. The regional vaccine action plan defines strategic goals and priority actions for health programs to guide efforts to prevent and control vaccine-preventable diseases from 2016 to 2020 and beyond. It takes into account the specific needs and challenges faced by member states in the region.

This plan can be used to manage vaccine uptake in the country and to optimize coverage, as the health systems must be organized to “absorb” the stocks of vaccines provided by international

assistance, and to ensure that these stocks are used for effective immunization campaigns that reach the populations most in need. In Europe, vaccine priorities to date have focused on three types of population: the chronically ill, the elderly, and health workers.

### 1.3. Interim conclusions, mid-crisis, and recommendations

At this point, the health crisis is not over. Most countries in the Mediterranean region are still in the active phase of pandemic transmission through the general population at the time of writing (see Table III.2 for country-by-country data). The five countries under consideration have not had the same rates of success. According to the reported data, the population-based case figures would seem to show that the two countries which are a priori the most robust in terms of health systems, Tunisia and Jordan, are the most exposed. But these data are unreliable, as surveillance of reported cases and deaths is extremely sensitive to the quality of the health service information system.

**Table III.2. Status of the epidemic as of June 2021**

|                | Deaths | Covid cases | % of deaths per case | Case/population | Deaths/population |
|----------------|--------|-------------|----------------------|-----------------|-------------------|
| <b>Algeria</b> | 3500   | 130000      | 2.69%                | 0.30%           | 0.008%            |
| <b>Egypt</b>   | 15000  | 265000      | 5.66%                | 0.26%           | 0.015%            |
| <b>Jordan</b>  | 9500   | 738000      | 1.29%                | 7.31%           | 0.094%            |
| <b>Morocco</b> | 9100   | 520000      | 1.75%                | 1.41%           | 0.025%            |
| <b>Tunisia</b> | 12800  | 349000      | 3.67%                | 2.91%           | 0.107%            |

Source: Johns Hopkins data, 3 June 2021.

99 <http://www.emro.who.int/vpi/vpi-infocus/eastern-mediterranean-vaccine-action-plan.html>

To conclude, we can highlight two major challenges for the months to come. There will of course be the question of the absorptive capacity of health systems in the face of the arrival of the vaccines and the degree of adaptation to mass vaccination. Another challenge for health systems will be (and already is!) the quality of management of other diseases (screening and follow-up), which are likely to be neglected because of the crisis. Indeed, in addition to the people it directly infects, Covid-19 indirectly kills, or will kill, thousands of people suffering from heart disease and cancer, who are poorly managed or poorly screened during the infectious crisis<sup>100</sup>.

## II. Digitalization as a means to improve healthcare in the Mediterranean

Constantin TSAKAS (CMI)

### II.1. Benefits of digitalization

The Covid-19 outbreak could play a catalyst role to promote digital health growth in the region. Alongside the human cost, detailed in the above section, the pandemic has taken a heavy toll on Mediterranean economies, societies and healthcare systems capacity. Digitalization is key to survival, whether it be through remote work, e-learning, or the use of online services. In the health sector, the possibilities offered by digitalization are also potentially

substantial. The current situation reveals the opportunity to harness the power of digital technology to fight the pandemic but also to massively benefit health systems in the long run<sup>101</sup>.

The current crisis, although putting strain on health systems worldwide, has accelerated implementation of digital strategies in health services in various countries across the world. Under the right circumstances and when necessary pre-requisites are met, such as having quality technological infrastructure and a sufficient level of digital literacy across the population, this increased use of digital technology can help breach healthcare inequities and be a step forward towards a more universal health coverage. Taking into account the economic and social context in the Mediterranean, digitalization can significantly improve healthcare and public health systems as set out below.

#### 1. Digital services can help counteract the negative effects of highly centralized healthcare systems

Telemedicine offers remote medical services using ICT and can serve people in isolated areas by providing access to medical services that may not otherwise be available or affordable. When mobile phones transitioned into smartphones, new possibilities opened-up including for lower income populations. Many places in the Mediterranean are rural

100 DeJong, C., Katz, M. H., & Covinsky, K. (2020). Deferral of Care for Serious Non-COVID-19 Conditions: A Hidden Harm of COVID-19. *JAMA Internal Medicine*.

101 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7414277/>

and have a shortage of healthcare providers. A number of practitioners, such as psychiatrists, often deliver counselling via telehealth for such patients who are not able to physically come to their clinic. Digital health systems have the potential to provide access to support networks for patients across the territory and can help determine who needs emergency assistance. They can also make quality health information more accessible, promote health literacy and offer online education, specifically in regards to health-related degrees. The availability of online education for healthcare professionals has eliminated the need to travel long distances and take time off work. All of these factors contribute to reducing healthcare inequalities.

## **2. Digitalization as a preventive and curative tool**

Increased “e-care” consultation for patients would mean fewer trips to a physician or a hospital, and would provide populations with access to medical advice even when homebound. Meanwhile, consumers and healthcare providers find Health apps accessible and useful in both receiving and providing care on a daily basis, and the time saved can add up to significant returns on investment.

Digital health technologies offer ways to self-manage health, with a focus on preventing disease and illness (pro-active) rather than simply treating them. This is relevant for Mediterranean countries (and for the wider MENA region) that face increasing rates of noncommunicable diseases (NCDs). For instance, the increasing prevalence of tobacco use is of public health concern in the region. Increases in the prevalence of overweight have also been observed (Mate et al, 2017)<sup>102</sup>. Remote monitoring devices and wearables (ex. to track heart rate and blood sugar) help people better manage their health, and can be a means to meet the need for improved monitoring of preventable and chronic diseases. Most particularly, as they can provide detailed insights to help assess the needs and concerns of patients in real-time, utilization of digital health technologies has been shown to improve treatment outcome in non-communicable diseases (NCDs) such as diabetes and hypertension<sup>103</sup>.

## **3. Digitalization allows for improved access to data and enhances efficiency**

Better and faster access to medical records would be particularly relevant for Mediterranean countries where considerable efficiency<sup>104</sup> gains are yet

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102 Kedar Mate, Caitlin Bryan, Nigel Deen, and Jesse McCall (2017), “ Review of Health Systems of the Middle East and North Africa Region ”, International Encyclopedia of Public Health. 2017, 347–356.

103 Ramli AS, Wijesinha S, Piterman L. Rejuvenating chronic disease management in Malaysian private general practice - a global perspective. *Malays Fam Physician* 2010;5(1):49-52.

104 The efficiency of a healthcare systems can be measured in terms of their resource use (input approach) and resource exploitation (output approach). Therefore, a healthcare system is “technically efficient” when the maximum possible improvement in outcome is obtained from a set of inputs or through the proportional reduction of its inputs while its output proportions are held constant (Dhaoui, 2019).



to be made in healthcare systems. As highlighted by Dhaoui (2019), it is feasible for all countries to optimize their efficiency by better allocating resources. This would include lower-middle income countries, which can be a reference for efficiency and best practices in the utilization and management of health resources<sup>105</sup>. In countries such as Algeria, Tunisia and Syria, it could lead to a potential improvement in life expectancy between 1.3% and 2.7%, without increasing input consumption. In this case, the introduction of digital technology can be a blessing when it comes to patient medical records. Electronic health records (EHR) can make life easier for both healthcare providers and patients. Access to EHRs has resulted in a centralized storage of all patient data and faster access for improved care and better outcomes. Healthcare professionals can now retrieve patient data easily and share medical information rapidly with each other, ultimately resulting in more efficient care, something

Mediterranean countries are in need of. An example is the “100 Million Lives” campaign in Egypt, which allowed the generation of a significant amount of medical data using a homegrown digital system<sup>106</sup>.

## **II.2. Challenges related to “digital readiness” in the Mediterranean**

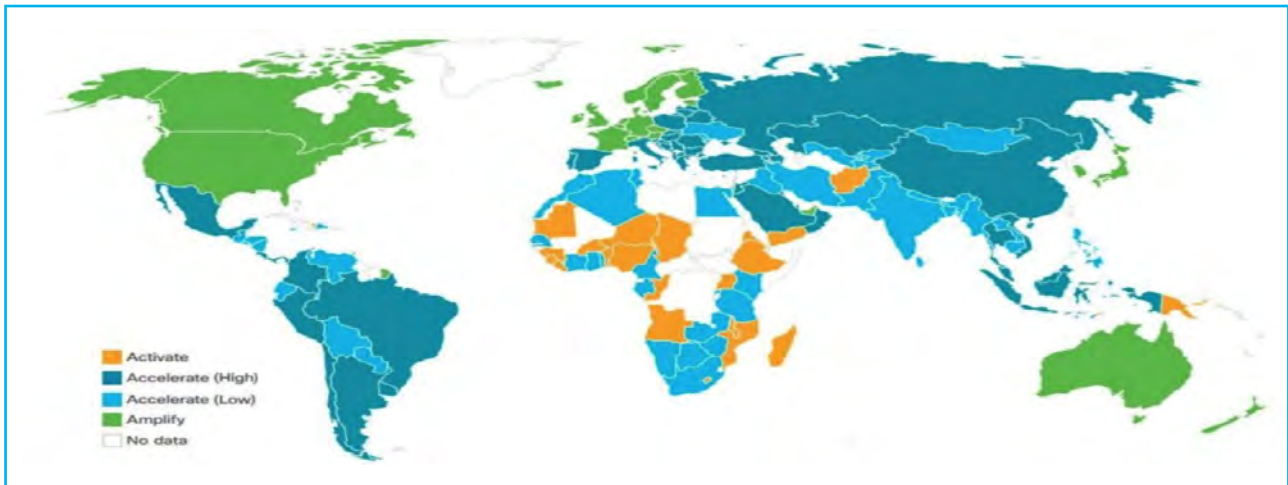
Healthcare is among the very few sectors to have such potential of deep change by digital technology. However, to ensure the benefits of digitalization truly materialize, there are also important challenges related to digital transformation that should not be underestimated. In fact, transformation must be supported by the right tools to ensure it is accessible to everyone and does not fuel inequalities. Across the Mediterranean, there are several difficulties in managing digital channels. These vary from country to country and even more from region to region because of the “digital divide” both between countries and within them.

105 Dhaoui, Iyad (2019), “Healthcare system efficiency and its determinants: A two-stage Data Envelopment Analysis (DEA) from MENA countries”, ERF Working Paper 1320, July, available at : <https://erf.org.eg/app/uploads/2019/02/11-69-Iyad-Dhaoui.pdf>

106 Hassanin, A., Kamel, S., Waked, I., & Fort, M. (2021). Egypt’s Ambitious Strategy to Eliminate Hepatitis C Virus: A Case Study. *Global health, science and practice*, 9(1), 187–200. <https://doi.org/10.9745/GHSP-D-20-00234>



### Map 3.1. Global Digital Readiness Index Map



Source: Cisco (2020)

Link: [https://www.cisco.com/c/m/en\\_us/about/corporate-social-responsibility/research-resources/digital-readiness-index.html#/](https://www.cisco.com/c/m/en_us/about/corporate-social-responsibility/research-resources/digital-readiness-index.html#/)

The map above provides an overview of the level of digital readiness across the world, including the Mediterranean. Three stages of digital readiness are identified: “Amplify”, “Accelerate”, and “Activate”. Countries in the middle stage of digital readiness “Accelerate” are further categorized as “Accelerate High” if they rank above the mean for their group, or

“Accelerate Low” if they rank below the mean (Box 1 explains the sub-components of the Framework). The South Mediterranean countries are all part of the intermediary category of readiness. With the exception of Jordan which is an “Accelerate High” country, all others are part of the “Accelerate Low” category.

### Box 3.1. Explaining the CISCO Framework of Digital Readiness

The framework takes a holistic approach that includes seven different components to build a complete picture of a country's digital readiness, they are:

1. Basic Needs, as the true value of technology and infrastructure is delivered through a population's ability to take advantage of it. This component includes data relating to life expectancy, the mortality rate of children under five years of age and access to basic services.
2. Human Capital, as the ability to utilize and create advanced digital services is determined in part by the digital skills level within the workforce. This component includes data on the total labor force participation rate, the adult literacy rate, the country's education quality and the average duration of schooling.
3. Ease of Doing Business, as having a thriving business ecosystem is a key determinant for participation of the private sector.
4. Business and Government Investment which is required for building digital infrastructure and capabilities.
5. Start-Up Environment as start-ups create new innovations that can benefit entire markets and communities and are often the leading creators of new wealth from digital technologies, and a crucial source of job creation.
6. Technology Infrastructure which plays a key role in enabling countries to advance digital services. To measure technology infrastructure, the component includes data related to active mobile broadband subscriptions, household internet access, fixed broadband subscriptions, and secure internet servers.
7. Technology Adoption which reflects a country's current level of digital progress and modernization. This includes data related to mobile cellular penetration, internet usage, and cloud services.

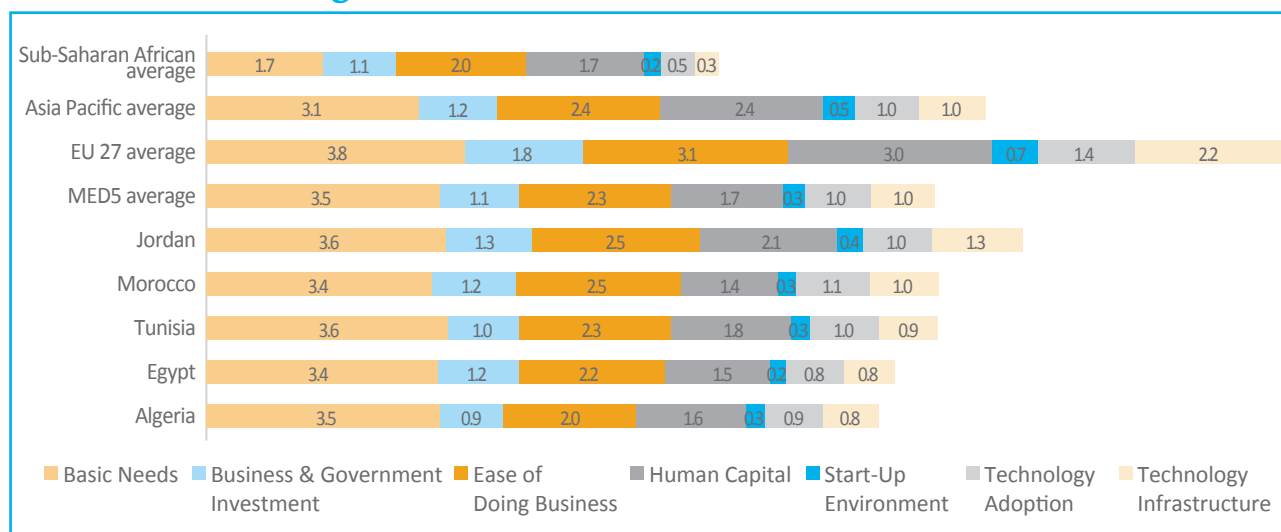
Such framework is a useful tool that allows comparisons across regions and can help build arguments towards decision-makers. However, it does not necessarily carry all the answers nor is it a perfect one, as the selection of specific sub-components and their ponderation to form the index can be associated with some level of subjectivity.

Figure III.4 decomposes the Digital Readiness Index for each Mediterranean country and allows drawing comparisons with the level of readiness in neighboring Sub-Saharan Africa and EU countries, as well as with Asia Pacific countries. It appears that Mediterranean countries are lagging in terms of the digital readiness of human capital. With the exception of Jordan, all countries rank below the EU27 and Asia-Pacific averages. In fact, as seen in Figure III.4, Morocco,

Egypt and Algeria even rank below the average score of Sub-Saharan African countries. Meanwhile, the performance of Mediterranean countries in terms of digital readiness for Business and Government Investment seems insufficient, equaling the average value found in Sub-Saharan Africa<sup>107</sup>. Last but not least, all Mediterranean countries but Jordan show a relatively low score in terms of digital technology infrastructure, below the averages of the EU27 and Asia-Pacific countries.

107 However, as advancements occurring in digital transformation amid the COVID-19 pandemic are fast-paced, evolutions can be expected in future data.

**Figure III.4. Global Digital Readiness Index decomposed, selected countries and regions**



Source: Cisco (2020)

Link: [https://www.cisco.com/c/m/en\\_us/about/corporate-social-responsibility/research-resources/digital-readiness-index.html#/](https://www.cisco.com/c/m/en_us/about/corporate-social-responsibility/research-resources/digital-readiness-index.html#/)

Indeed, as highlighted in a recent CMI-FEMISE paper (2020)<sup>108</sup>, in the Southern and Eastern Mediterranean, the use of digital technologies is growing but there is still a need to address network deployment (infrastructure) and affordability issues. The demand for broadband services and data has increased significantly during the pandemic. But there are supply issues and several countries have seen network congestion, decline in Internet speed and deterioration of service quality. Guermazi (2020) notes there are five main reasons why networks (supply) were not able to cope with the increased demand during the pandemic<sup>109</sup>: i. Intensive use of the network during daytime in residential areas (networks were not designed for peak-time service),

ii. Increased consumption of video and other high-bandwidth entertainment services, iii. Increased consumption of videoconferencing and cloud services, iv. Distance learning by students and v. Lack of sufficient capacity for consumers through international gateways (i.e., access points where Internet enters the country).

Meanwhile, security and privacy infrastructures, especially for health data, must be strengthened. It is important to have a sufficient number of secure web servers to store the content available for the public as well as other confidential data. Since Web Servers are accessible to the public, they are prey to malicious threats. Smaller businesses and entities often have a single physical server that executes many functions (Web Server, Database Server, E-mail

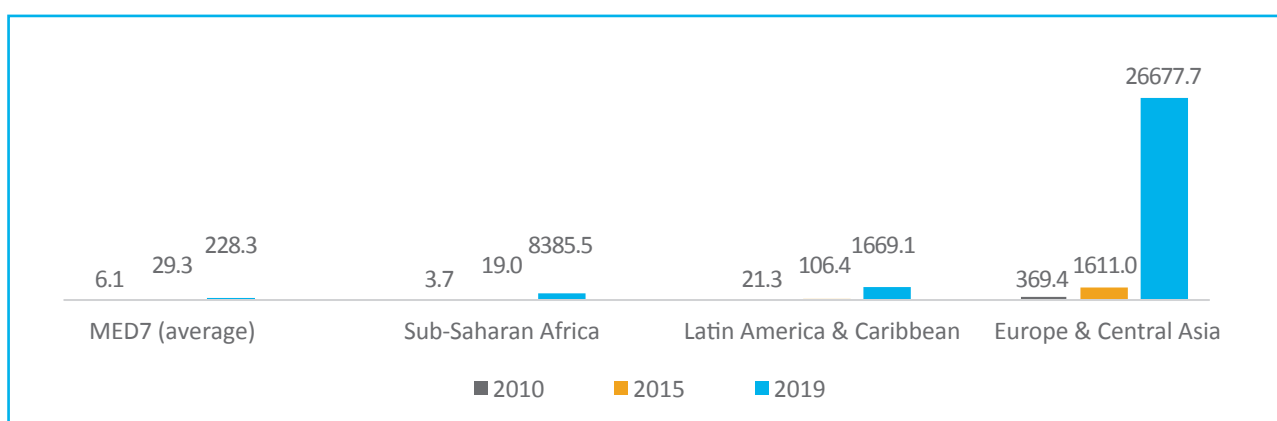
108 “A Digital Financial Education to Support the “New Normal” in the Post-Pandemic Era” by Valeria Stefanelli, Vittorio Boscia and Marco Trinchera

109 Guermazi, Boutheina (2020), “Digital transformation in the time of COVID-19: The case of MENA”, World Bank Blog, July 29, 2020.

Server) which means that compromising a single server can expose the entire business data. Right now, the number of secure web servers in Mediterranean countries is very low, with an average of 228.3 servers per 1 million people (Figure III.5). This is about 4 times less than in Sub-Saharan Africa (SSA), even though 5 years ago the Mediterranean countries still had more secure servers than SSA. Meanwhile, the Latin America & Caribbean region now has almost 8 times more secure servers than the

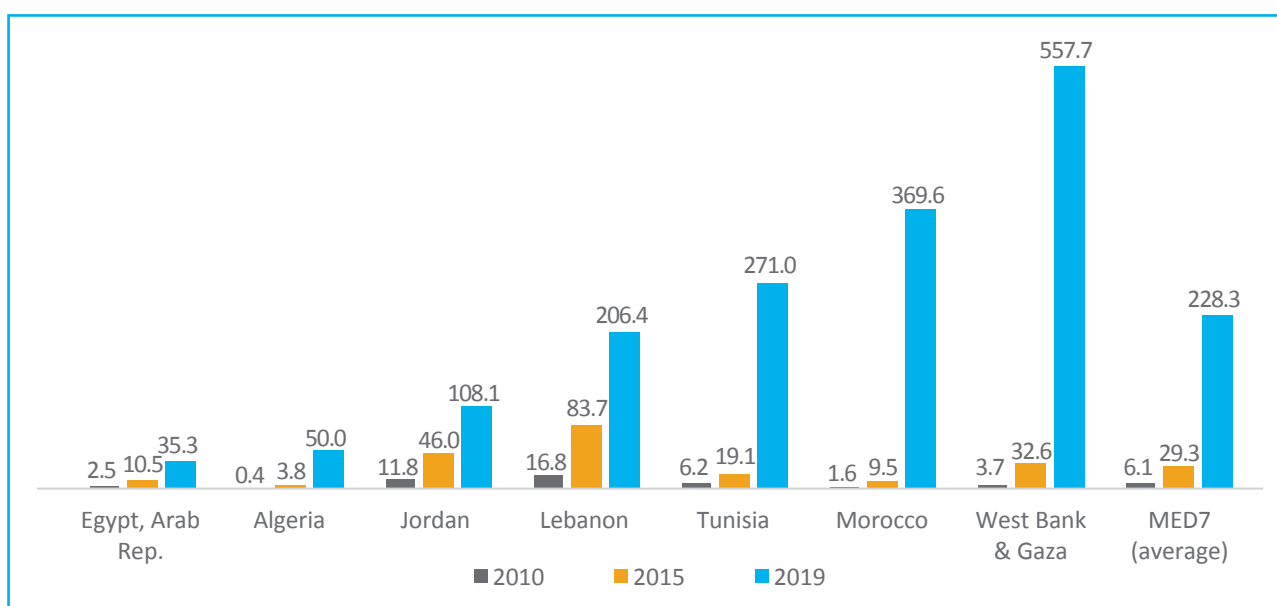
MED7 (see figure below); it already had 3 times more servers in 2010. This indicates that Mediterranean countries need to invest more to catch-up, especially in countries such as Algeria and Egypt (50 secure servers or less per million people) (Figure III.6). Currently, the Southern and Eastern Mediterranean is the area where the population's confidence in personal data protection is the lowest in the world, which contributes to slowing down digital use (Augier & Francois, 2019).

**Figure III.5. Secure Internet servers (per 1 million people), by region**



Source: World Bank, <https://data.worldbank.org/indicator/IT.NET.SECR.P6>

**Figure III.6. Secure Internet servers (per 1 million people), by country**



Source: World Bank, <https://data.worldbank.org/indicator/IT.NET.SECR.P6>

A comment should address how sensitive data are handled by the authorities of any country. Indeed, the same technologies that can contribute to more inclusiveness might also make populations easier to monitor and control, which can prove dangerous in the wrong hands. Though complex to draft, legislation dealing with data security would be necessary to ensure privacy. In the meantime, policy makers need to consult with privacy enforcement authorities and ensure that any extraordinary measures that allow the use of personal data (ex. in case of a pandemic) are proportionate to the risks and implemented with transparency and accountability. Also, they must commit that such measures do indeed remain extraordinary and that they will be ceased/reversed when the crisis is over<sup>110</sup>.

Another challenge to consider is that unequal access to quality broadband connectivity may jeopardize stability and increase social inequality, including for access to health services, between those who can use digital connectivity and those disadvantaged groups without adequate access to the Internet. Countries such as Jordan and Lebanon have a head start in reducing the digital divide, as they have higher internet penetration due in part to their urban nature. In

fact, about 78.2% of the Lebanese population uses the internet, a percentage as high as that observed in Europe & Central Asia (see Figure III.7). Meanwhile, countries such as Algeria, Egypt, Morocco and Tunisia have lower literacy<sup>111</sup> than their Levantine counterparts and a total of 100M citizens are still unconnected (ICANN, 2017)<sup>112</sup>. The situation in Algeria is particularly troubling, as less than 50% of the population use the internet.

Overall, the ability of populations to integrate technological evolutions is very important. In order to tackle the digital divide, UNESCO<sup>113</sup> has proposed that education must look at issues related to technological access, teacher preparedness, and school-family communication. As for the elderly, programs that embed technology training in existing community-based organizations could be explored, with increased support provided at the local level. Meanwhile, to properly benefit from e-health services and applications, one needs to have access to a mobile subscription and phone. In that respect, the number of mobile cellular subscriptions has considerably increased in Mediterranean countries on average (see Figure III.10). It is now close to that observed in Latin American countries. Countries such as

110 OECD (2020), “OECD Policy Responses to Coronavirus (COVID-19): Ensuring data privacy as we battle COVID-19”, April 14th 2020. available at: <https://www.oecd.org/coronavirus/policy-responses/ensuring-data-privacy-as-we-battle-covid-19-36c2f31e/>

111 Digital literacy is the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills. Functional illiteracy, which still exists in several countries, exacerbates digital illiteracy.

112 ICANN (2017). “Accelerating the Digital Economy in the Middle East, North Africa and Turkey”. Available at: <https://www.icann.org/en/system/files/files/accelerating-digital-economy-report-09oct17-en.pdf>

113 UNESCO. COVID-19 Educational Disruption and Response. 2020. Accessed 6/5/2020.

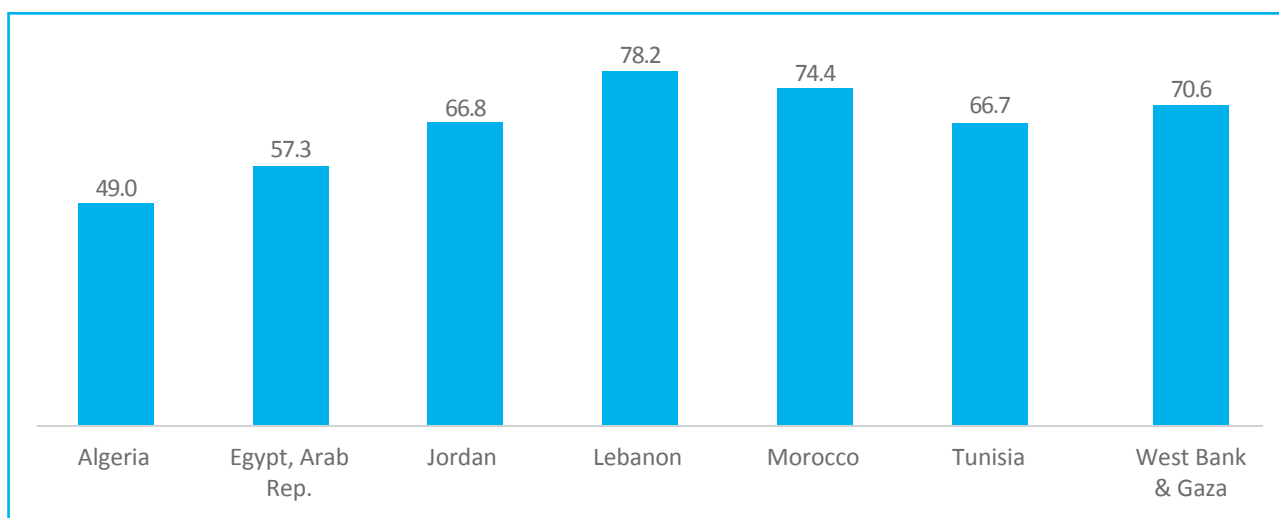


Tunisia and Morocco now have more subscriptions per 100 people than Europe and Central Asia (see Figure III.9). Even though it has a relatively high “internet literacy”, Lebanon is last among the MED7 in terms of number of mobile subscriptions per 100 people (62), followed by Jordan (77).

Across Med countries, Morocco is acknowledging the importance of the knowledge economy and has approved a five-year roadmap for the country’s

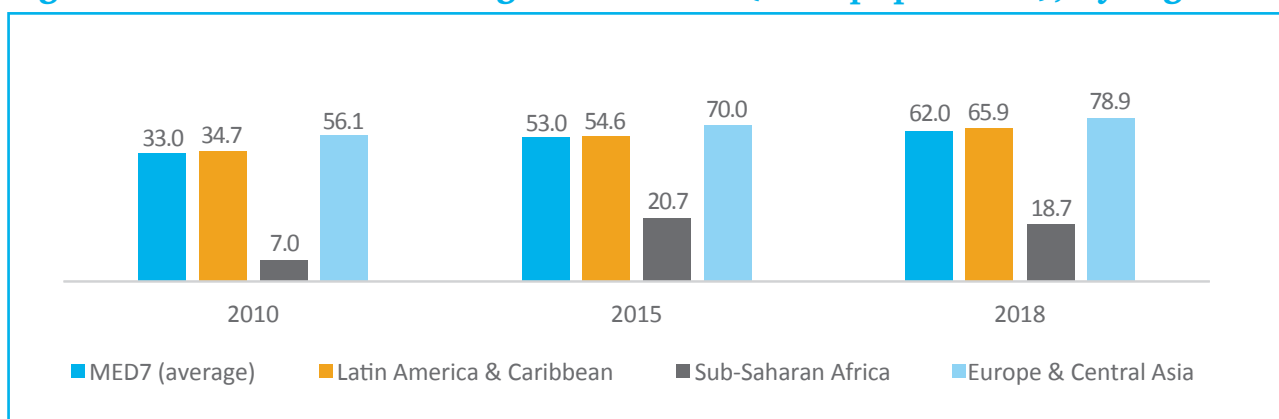
digitalization, aiming to become “the digital hub of Africa”. Recently, the country announced that it wants to use digital technology to attract MAD10 billion (about US\$1.04 billion) in FDI and create more than 120,000 direct and indirect jobs. This would include supporting digital companies, accelerating the digitalization of public administrations, improving the governance of the public sector, and strengthening digital sovereignty (Ecofinagency, 2020)<sup>114</sup>.

**Figure III.7. Individuals using the Internet (% of population), latest available year**



Source: World Bank, <https://data.worldbank.org/indicator/IT.NET.USER.ZS>

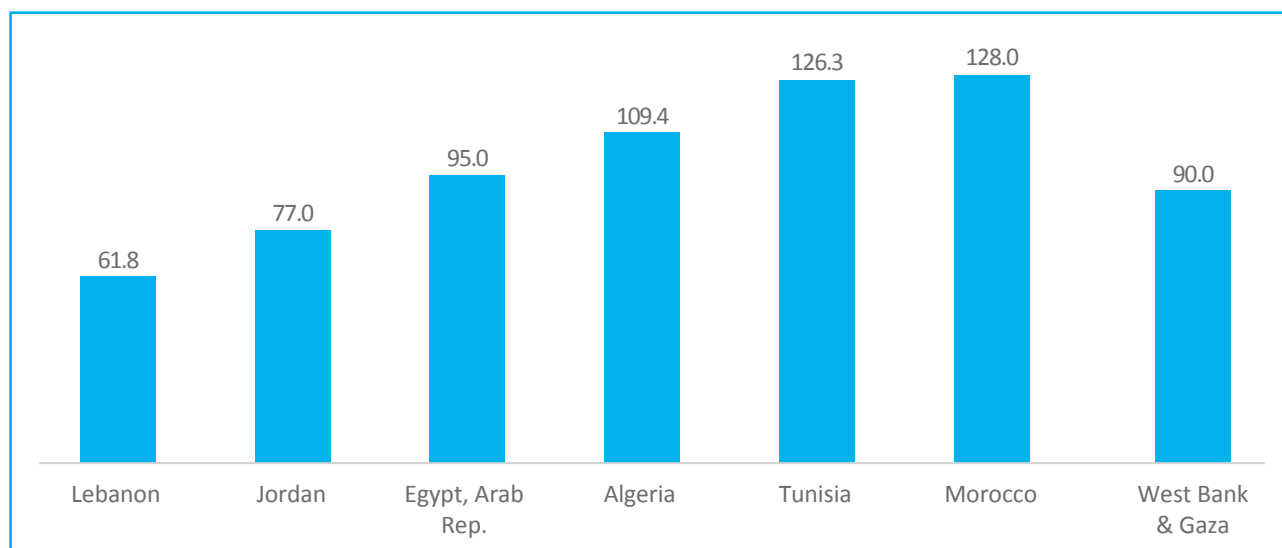
**Figure III.8. Individuals using the Internet (% of population), by region**



Source: World Bank, <https://data.worldbank.org/indicator/IT.NET.USER.ZS>

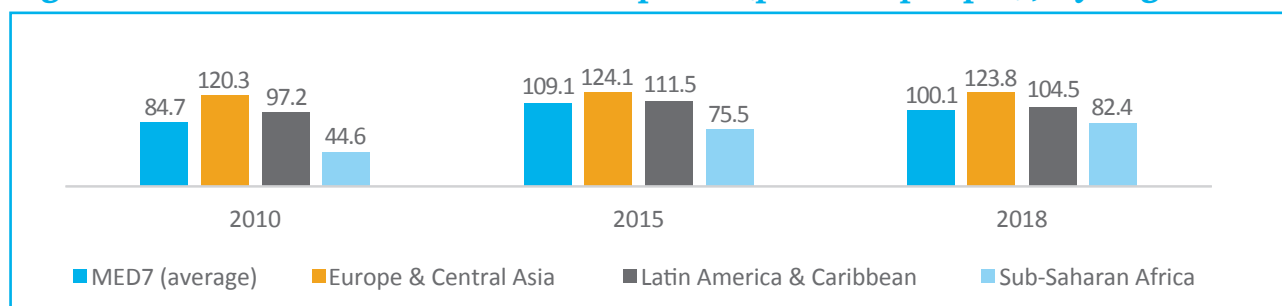
114 EcofinAgency. 2020. Morocco wants to use digital technology to attract \$1bln+ in FDI, June 25.

**Figure III.9. Mobile cellular subscriptions (per 100 people), latest available year**



Source: World Bank, <https://data.worldbank.org/indicator/IT.CEL.SETS.P2>

**Figure III.10. Mobile cellular subscription (per 100 people), by region**



Source: World Bank, <https://data.worldbank.org/indicator/IT.CEL.SETS.P2>

Last but not least, issues such as corruption, political instability and government bureaucracy, also limit the development of a digital economy (World Economic Forum, 2016)<sup>115</sup> and need to be dealt with. Appropriate governance for innovation and ICTs is severely lacking in most countries in the region<sup>116</sup>. In the technological realm, factors such as organizational capacities, regulatory procedures and labor markets all

contribute to strengthening digitalization and ICT. But such conditions are not yet existent in most SEMCs. Furthermore, cultural and political factors limit the probability that such conditions might emerge. Corruption also remains a central challenge, as evidenced by the corruption perceptions index<sup>117</sup> which in most SEMCs falls behind both the Americas and Asia Pacific regions, while sub-Saharan African countries perform

115 World Economic Forum (2016), The Global Competitiveness Report 2016-2017, available at: [http://www3.weforum.org/docs/GCR2016-2017/05FullReport/TheGlobalCompetitivenessReport2016-2017\\_FINAL.pdf](http://www3.weforum.org/docs/GCR2016-2017/05FullReport/TheGlobalCompetitivenessReport2016-2017_FINAL.pdf)

116 Göll E, and J Zwiers (2018) ‘Technological trends in the MENA region: the cases of digitalization and Information and Communications Technology (ICT)’, MENARA Working Papers No. 23. Available at : [https://www.iai.it/sites/default/files/menara\\_wp\\_23.pdf](https://www.iai.it/sites/default/files/menara_wp_23.pdf)

117 <http://info.worldbank.org/governance/wgi/Home/Reports>

slightly better. Persistent corruption impedes on the attractiveness of investing in the SEM countries. Combined with bureaucracy and lack of government support, it has led to a situation that is less open to startups than in many other parts of the world (Göll and Zwiers 2018).

### **II.3. Going forward: success is intrinsically linked to regional/international cooperation**

Based on the needs identified above, Mediterranean countries would need to focus on the following quadriptych which would facilitate the emergence of a digital health ecosystem:

- i. Facilitate investment, both private and public, in the digitalization of enterprises, including foreign direct investment and R&D spending, and attracting talented people through financial incentives for start-ups. Very-small enterprises (VSEs) and SMEs are often the first to suffer from the lack of digitalization. This is even true in a country like Morocco where, while the population is overall comfortable with digital tools, many SMEs and VSEs are struggling to lead their own digital revolution. They face a lack of digital culture and skills, insufficient financial support, territorial digital divide, as well as ambivalent relations with online platforms (Jaïbi, 2020)<sup>118</sup>.
- ii. Develop technology infrastructure, including access to mobile broadband, household internet access and secure internet servers. Security is key here, therefore governments will also need to ensure they have adequate policy frameworks regarding patient-data confidentiality and should facilitate the transfer of this data between providers, according to patients' demands.
- iii. Develop an appropriately skilled labor force, one that is available to support digital innovation. It seems appropriate to implement policy measures aimed at raising the level of e-health education of individuals (including both medical personnel and patients) through a higher knowledge of the methods of use. Health professionals should be provided with enhanced access to educational media, including open online courses, to develop strong institutions which will be needed in the process of digital transformation. These would include<sup>119</sup> formal institutions (laws, rules, and regulations), combined with an open trade regime, that facilitate technology penetration and development of business activities, allowing for easy entry and exit of firms and facilitating competition to lower prices and increasing coverage and quality. Informal institutions, based on socially-shared rules, would also play a key role. They may include the level of innovation and conditions that allow the digital transformation, the level of trust in the digital economy, as well as digital security and awareness to flourish.

118 <https://www.institutmontaigne.org/en/blog/coronavirus-and-africa-morocco-model-crisis-management>.

119 Arab Economic Unity Council, League of Arab States. (2020), "Arab Digital Economy Vision: Towards a Sustainable, Inclusive and Secure Digital future", available at : <https://www.arab-digital-economy.org/09.pdf>

However, this cannot be realized in isolation. First, for an efficient digital transformation, cooperation between the private sector and government authorities is a prerequisite. To realize their full potential, innovative digital health initiatives from the private sector must become part of the wider health ecosystem. A selection of Mediterranean e-Health Start-ups that carry potential are presented in Box 3.2. Authorities should facilitate the

emergence of such initiatives, facilitate their growth and replication, cooperate with their carriers and include them as part of a comprehensive multi-stakeholder national strategy that integrates sound governance, as well as financial, management, human and technical resources. Thus far, Mediterranean e-Health cooperation initiatives between different actors deserve further support (some examples presented in Box 3.3).

### Box 3.2. Mediterranean e-Health Start-ups that carry potential

| Country | Name    | Description  |
|---------|---------|--|
| Egypt   | 7keema  | 7keema is a mobile application that provides on-demand home-based nursing services which covers multiple nursing dimensions. Since founded, 7keema has been making a huge effort towards nursing and technology sectors. As a result, 7keema is now known as the no.1 mobile application in home nursing in Egypt. Among the services provided by 7keema: personal, therapeutic care (Intramuscular, intravenous, fluid transfusion, oral medication), Elderly Care, Home Shift, Child Care.<br><a href="https://7keema.com/mobile-application/">https://7keema.com/mobile-application/</a>  |
|         | Bypa-ss | Bypa-ss is an Egyptian startup digitizing Healthcare Information Exchange, working with care providers and digital health companies. Bypa-ss provides a unified record for each patient, their multi-sided solutions synchronizing with each other to consolidate records from different healthcare providers.<br><a href="https://www.bypa-ss.com/">https://www.bypa-ss.com/</a>  |
|         | Vezeeta | Ranking first of the top funded healthcare startups in 2018 is Vezeeta, a leading digital healthcare platform in the MENA region. With over 200,000 verified reviews, patients are able to search, compare, and book the best doctors in private clinics and hospitals. Users can also book lab tests, scans and services & operations. Vezeeta is based in Egypt, with offices in Riyadh, Amman and Dubai, attracting investors from all over the MENA region and internationally. In early 2020, Vezeeta raised a US\$40 million Series D funding round <sup>120</sup> to boost its product innovation and fund global expansion plans.<br><a href="http://www.vezeeta.com">www.vezeeta.com</a>  |
| Jordan  | AlTibbi | Launched in 2008, AlTibbi is a digital health platform which aims at presenting reliable, up-to-date and simplified medical information to people in the MENA region in Arabic. The AlTibbi website features, among others, thousands of medical articles, a medical glossary, a section that is dedicated to questions and answers, telehealth services and consultations. In 2019, the platform enabled doctors to activate the e-clinic, a patient management system where they could manage patients' files, appointments booking and electronic health records online and launched services globally. Aspiring to be the no.1 digital health platform in the Arab world, AlTibbi has also partnered with Mawdoo3, a leading online Arabic content provider, to provide high quality content to a growing audience in the region.<br><a href="https://altibbi.com/">https://altibbi.com/</a> |

120 <https://disrupt-africa.com/2020/02/egyptian-e-health-startup-vezeeta-raises-40m-series-d-funding-round/>

|                         |                  |   |
|-------------------------|------------------|---|
| <p><b>Jordan</b></p>    | <p>Webteb</p>    | <p>Founded in 2011, Webteb is an online healthcare platform that provides comprehensive health and medical information in Arabic. It covers sections ranging from health and beauty, pregnancy and birth to medicine and diseases. Webteb publishes evidence based on medical information from accredited health and professional institutions and provides licensed content from global organizations and academic institutions. WebTeb's website has 7.8 million monthly users and 30 million monthly views. Webteb received a \$3.2M funding through a Series C investment from Sadara Ventures and Siraj Palestine Fund in their latest fundraise, bringing the total amount raised to over \$5M. It ranked 13th in the ranking of Forbes for the 100 strongest Arab startups.<br/><a href="https://www.webteb.com/">https://www.webteb.com/</a></p>  |
| <p><b>Lebanon</b></p>   | <p>Kirontech</p> | <p>Founded in 2017, Kirontech is a Lebanese startup that works to “absorb, process and protect” data collected by personal health trackers such as electronic health records, genomic data, research data and health insurance claims. Through machine learning technology it plans to revolutionize the use of healthcare data. It aims to digitalize the world of health insurance to boost efficiency by providing AI-based technology to insurers. It raised a total of \$3.25M from Leap Ventures and B&amp;Y Venture Partners (YVP).<br/><a href="https://www.kirontech.com/">https://www.kirontech.com/</a></p>  |
| <p><b>Morocco</b></p>   | <p>MedTrucks</p> | <p>MedTrucks has the following idea - to bring the doctors to their patients, not the reverse. This is easier said than done in a country like Morocco, which faces the problem of medical desertification where large parts of the country have no medical facilities. Thus, MedTrucks offers a free and open-access patient mapping platform for health stakeholders in order to measure the extent of medical deserts. Medical trucks are then sent to all of the places where there were none. A training platform for nursing staff is also provided. Based in France, Medtrucks and its mapping service was supported by French banks, while the business was incubated at Espace Bidaya in Casablanca.<br/><a href="https://www.medtrucks.com/">https://www.medtrucks.com/</a></p>   |
| <p><b>Morocco</b></p>   | <p>PocketDoc</p> | <p>PocketDoc is a mobile application, a medical decision support tool for medical students, physicians and health professionals. Founded in 2018, the mobile application allows users to select from 20 medical specialties, consult more than 250 complete and verified medical files, and access a list of medicines sold in Morocco. It offers, among other things, one-click access to therapeutic care for the most frequent and serious pathologies, complete and verified prescriptions for the different phases and forms of the disease, diagrams and tables better explaining the content of prescriptions. This medical database and search engine allows Moroccan specialists to search for a diagnostic and receive a complete and verified medical file that contains all the necessary information about that disease.<br/><a href="https://getpocketdoc.com/">https://getpocketdoc.com/</a></p> |
| <p><b>Palestine</b></p> | <p>Myndlifft</p> | <p>With the help of neuroscientists, pediatric neurologists and computer scientist, Myndlifft has transformed clinical neurofeedback to mobile. A headset is used to detect and measure brain wave activity, that is dynamically transferred to Myndlifft's mobile app at real-time to offer the user a set of mind-controlled ‘gamified’ exercises that are based on an evidence-based technique, called neurofeedback. This improves brain performance.<br/><a href="https://www.myndlifft.com/">https://www.myndlifft.com/</a></p>   |

Source: Magnitt (2018)<sup>121</sup>, SiliconIndia (2019)<sup>122</sup> and start-up dedicated websites.

121 <https://magnitt.com/news/top-7-funded-digital-healthcare-startups-mena-31063>

122 <https://startup.siliconindia.com/ranking/middle-east-healthcare-startups-2019-rid-720.html>



### Box 3.3. Mediterranean e-Health initiatives driven by cooperation between public sector, international actors and/or non-profits

| Country | Name                   | Description  |
|---------|------------------------|--|
| Jordan  | Services Advisor       | As refugees are forced to migrate, they are in need of key services like shelter, food, education and healthcare. Services Advisor <sup>123</sup> acts as a digital solution. The app was initially launched to aid Syrian refugees in Jordan, it now helps users find the humanitarian services they need including medicine. It was developed by UNHCR and PeaceGeeks, a nonprofit organization based in Vancouver (Canada) and Amman (Jordan) that builds digital tools to empower communities. The app, available in English and Arabic, allows users to filter services by type, location, and proximity to obtain the right help at the right time. Data is updated weekly by humanitarian service providers on the ground, so that users can be sure they are accessing the most accurate and up to date results. |
| Morocco | Santé Connect & Tbib24 | The Ministry of Health <sup>124</sup> recently launched a community social network, entitled Santé Connect, to bring together all health professionals, in order to discuss and take all the measures necessary to protect citizens against the pandemic. Santé Connect provides access to, in addition to real-time medical news, networking with healthcare professionals, libraries of medical content and online training, as well as support for patients through the mobilization of volunteer doctors on the Tbib24 portal. This service brings together several volunteer doctors from different medical specialties which are ready to offer remote medical advice free of charge.  |

Second, and perhaps most importantly, a factor that will be decisive for the Mediterranean as a whole is cooperation on a regional and international scale. Rising debt and deteriorating fiscal balances have left Mediterranean countries with zero room for maneuver.

Without cooperation it will simply be impossible for them to raise sufficient resources to build digital health ecosystems. Among the strategic objectives highlighted by the WHO (2020)<sup>125</sup> for a global strategy on digital health is the one of promoting global collaboration and advancing the transfer of knowledge on digital health. This objective,

particularly relevant to Mediterranean countries, aims to align countries and stakeholders to collectively act upon global opportunities to improve health and work towards universal health coverage, while meeting related challenges and risks. Indeed, Mediterranean countries will need to look across their borders and form innovation partnerships with other countries. This can also contribute to bringing-in foreign investors to help shape Mediterranean e-health systems post-Covid. Mediterranean countries should also consider bringing in venture capitalists to boost investment in new, high-risk, ICT-related projects. In addition to bringing funds, venture

123 <https://peacegeeks.org/services-advisor>

124 <https://maroc-diplomatique.net/covid-19-le-ministere-de-la-sante-lance-santeconnect-et-tbib24/>

125 World Health Organization (2020), “Draft global strategy on digital health 2020–2025”, <https://www.who.int/docs/default-source/documents/g4dhdad2a9f352b0445bafbc79ca799dce4d.pdf>

capital also provides business advice and introduces enterprises to networks of similar businesses and potential partners.

Digital Health cooperation in an EU-Mediterranean-Africa axis seems particularly relevant here. SEMCs countries should improve their regional digital connectivity with wider markets in Africa and Europe in order to increase their efficiency, exchange innovative good practices, coordinate a response in the event of a crisis, and create sustainable jobs. Fostering regional connectivity would require adopting new technologies and providing “digital public goods”, including fast and reliable high-speed internet solutions (Arezki et al, 2020)<sup>126</sup>. Countries such as Morocco, Algeria and Tunisia are already linked through a “telecommunications highway” by thirteen cables, which provide the three Maghreb countries with a higher level of connectivity than the rest of the African continent<sup>127</sup>. Egypt is also solidifying its position as a digital hub connecting Africa, Europe and Asia in partnership with the private sector (Google)<sup>128</sup>.

Having similar regulatory frameworks and norms, and harmonizing

interoperability among all countries, would create ideal conditions for digital transformation (Stefanelli et al, 2020). In fact, governments could make payments to health systems conditional to their interoperability. SEMCs countries should cooperate in adopting (and harmonizing) suitable regulations regarding personal data confidentiality, data governance and digital security. In this perspective, a Mediterranean E-Health Forum could be set up, composed of members from Mediterranean countries (practitioners, academia, policy stakeholders, businesses, civil society), which together with selected international institutions with technical expertise, would promote a common Digital Health Roadmap in the Mediterranean, based on exchanges of ideas, experiences and virtuous programs.

Recent initiatives<sup>129</sup>, emanating from the civil society and private sector, leave hope for a future based on cooperation and allow for optimism when seeing the determination of young Mediterraneans who launch joint projects to help their communities. Such determination and willingness to cooperate needs to be matched by public authorities across Mediterranean countries.

126 Arezki, Rabah; Moreno-Dodson, Blanca; Yuting Fan, Rachel; Gansey, Romeo; Nguyen, Ha; Nguyen, Minh Cong; Mottaghi, Lili; Tsakas, Constantin; Wood, Christina A. 2020. “Trading Together: Reviving Middle East and North Africa Regional Integration in the Post-Covid Era” Middle East and North Africa Economic Update (October), Washington, DC: World Bank. Doi: 10.1596/978-1-4648-1639-0. License: Creative Commons Attribution CC BY 3.0 IGO

127 <https://cio-mag.com/afrique-du-nord-les-cables-sous-marins-comme-enjeu-economique-et-strategique/>

128 TelecomEgypt (2021), “Telecom Egypt provides Google with a TransEgypt meshed solution and Mediterranean capacity to Europe, January 4th. See : <https://ir.te.eg/en/CorporateNews/PressRelease/137/Telecom-Egypt-provides-Google-with-a-TransEgypt-meshed-solution-and-Mediterranean-capacity-to-Europe>

129 Among such initiatives, is the recent Covid-19 Maghreb Bootcamp project.

### III. Which strategies to develop an innovative and robust pharmaceutical industry in the Mediterranean region?

**Sami Mouley** (Professor,  
University of Tunis)

The unprecedented, multidimensional crisis generated by the Covid-19 pandemic, which has weighed heavily on Mediterranean economies, has also had negative sectoral repercussions on certain productive activities in the region (Mouley, 2020). In addition to the economic and social policy response to the health crisis, the focusing of exit strategies on the sole objective of containing the pandemic should not obscure the need for in-depth restructuring of health systems in the Mediterranean countries. The end of the crisis may also constitute a windfall effect or, to use Rodrik's terminology (1996), a window of opportunity for disruptive reforms of the health sector, in particular through the implementation of new strategies to develop an innovative and robust pharmaceutical industry in these countries.

As we have seen in the previous chapter, this awareness will probably lead to relocations by multinationals of certain production segments and/or to a reconfiguration of GVCs chains. There is likely to be a trend towards the regionalization of supply sources. This hypothesis of evolution, on which the present report is largely

based, is particularly relevant in the pharmaceutical sector. As some Mediterranean countries are already well positioned in the drugs and pharmaceuticals sector, the region clearly has an opportunity in this context to develop the sector in the post-Covid crisis period.

It is the right time for these countries to implement strategies that respond to the structural difficulties of the region through the reinforcement of health expenditure and investments in the health sector, industrial innovation and participation in regional value chains, all of which are vectors of an inclusive and sustainable growth model that until now has not received enough attention in the region.

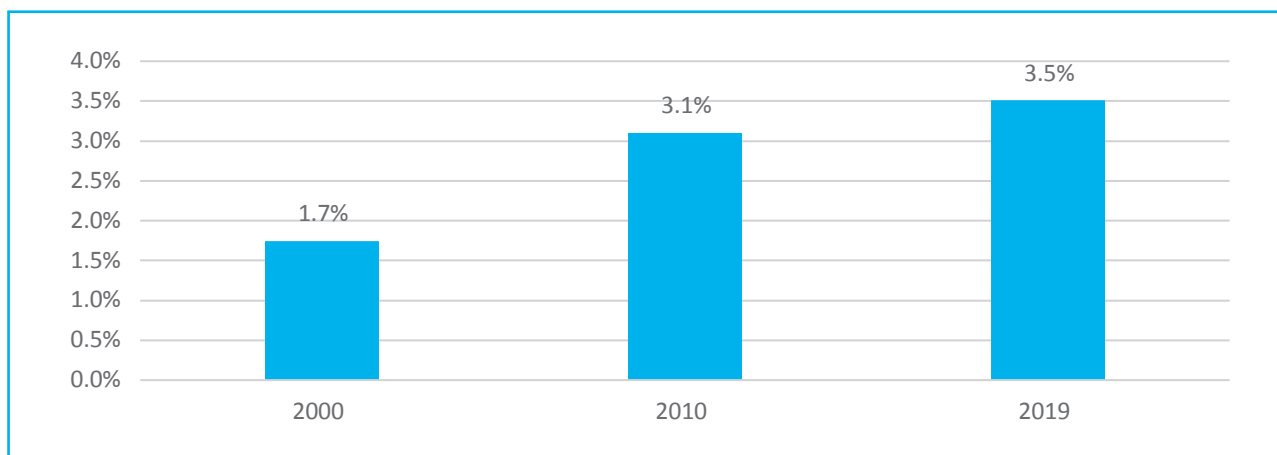
#### III.1. Dynamics of the global pharmaceutical market

The global pharmaceutical market has changed significantly over the last 15 years, not least because of the strong breakthrough of Chinese and Indian companies. Total net sales in the sector are estimated at between \$868 million and \$1.13 billion, or an average of 1.5% of global GDP, and the sector is estimated to grow at least threefold in size over the next 50 years<sup>130</sup>.

It is therefore an industry with strong growth potential that is further strengthened by the current pandemic context. Indeed, the industry's share of world trade has grown steadily from 1.7% in 2000 to 3.1% in 2010 and 3.5% in 2019 (Figure III.11).

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130 The Future of the Global Pharmaceutical Industry (2017).

**Figure III.11. Share of the pharmaceutical industry in world trade in 2000, 2010 and 2019**

Source: COMTRADE, UNSTAT (Authors' calculations).

World trade is dominated by developed countries, although their share has decreased slightly (about 89% of world exports in 2018 compared to 92.8% in 2000). Middle-income countries have gained 2 percentage points, from around 6% in 2000 to just over 8% in

2018. The trade shares of China and India are most impressive. Between them, they accounted for 5.5% of global trade in pharmaceuticals in 2018. In the same year, the Mediterranean region as a whole (including Israel) accounted for only 1.1% of this trade (Table III.3).

**Table III.3. Share of countries or groups of countries in world exports of pharmaceutical products**

|                                 | 2000  | 2010  | 2018  |
|---------------------------------|-------|-------|-------|
| High-income economies           | 92.8% | 91.3% | 89.1% |
| Low and middle income economies | 6.1%  | 6.6%  | 8.2%  |
| China                           | 1.7%  | 2.4%  | 2.9%  |
| India                           | 1.1%  | 1.6%  | 2.6%  |
| Med Countries (*)               | 0.6%  | 1.7%  | 1.1%  |

Source: COMTRADE, UNSTAT (Authors' calculations).

(\*) Med Countries: Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine and Tunisia.

In spite of a still limited place in the international trade of these products, the countries of the Mediterranean region have adopted strategies to develop the pharmaceutical sector, having made it one of their priority sectors.

The pharmaceutical industry is indeed buoyant on the international scene and is the subject of particular attention from all the Mediterranean countries. On the one hand, it helps to satisfy the essential needs of the populations, which will continue to grow and

become more complex under the effect of demographic growth, urbanization and the epidemiological transition that the region is undergoing. On the other

hand, it is a sector with high added value, which presents important opportunities for industrialization, job creation and the development of new markets.

### Box 3.4. Pharmaceutical sector strategy in one Mediterranean country (Tunisia)

The pharmaceutical sector is one of the priority sectors mentioned in the new investment law, enacted in 2017, designed to promote investment, regional development and innovation. As such, a pact for the development of the competitiveness of the pharmaceutical sector, covering the period 2019-2023, was adopted by the restricted ministerial council of 11 June 2018 as part of an overall plan to boost the sector, prioritizing three specific measures: (i) revision of the pricing, reimbursement and compensation system, (ii) implementation of a restructuring program for the sector in terms of manufacturing, import, distribution and consumption in partnership with an international financial institution, (iii) creation of a fund for the development and upgrading of the pharmaceutical industry and distribution channels accompanied by tax incentives. Three complementary areas that can be achieved in the medium term by 2023 have also been identified: (i) encouragement of operators to develop biotechnology within the framework of public-private partnership (PPP), (ii) improvement of the institutional framework for the development of preclinical and clinical trials as export services, and (iii) direct support for export.

The Mediterranean drug market is supplied by local production, in proportions that vary according to the country, and by imports, essentially from European countries, particularly France (56% of the market), Switzerland (13%), the United Kingdom (6%), Italy (4%), Denmark (3%) and Germany (3%). Local production essentially concerns generic drugs<sup>131</sup>, which are produced either by local manufacturers or by subsidiaries of foreign groups established in these countries. The more complex originator drugs<sup>132</sup> continue to be imported for the most part, including in Egypt, Morocco and Tunisia, which have recently sought

to develop new capacities in the drug R&D segment (Mouley and Verdier, 2019). In relation to the size of their local markets, Egypt and Algeria are positioned as the largest producers and consumers of pharmaceuticals in the region under study, followed by Morocco, Tunisia and Jordan.

In Algeria, the pharmaceutical industry sector covers 52% of domestic needs in medicines. In Egypt, the pharmaceutical industry forms an important sector thanks to the extent of local production of generic drugs (60% of the market share). Imports of pharmaceutical products are mainly made up of the latest high-tech drugs such as those

131 Generic drugs are off-patent molecules.

132 Originator drugs are patent-protected medicines. The production of originator drugs accounts for just over 40% of global employment, while generic drugs account for just over 55%. The remaining 5% of global employment is devoted to the manufacture of over-the-counter (OTC) medicines.



prescribed for the fight against cancer or diabetes. The import rate increased between 2018 and 2019 by 19% for drugs consisting of mixed products. Due to its high production, Jordan exports more than 80% of its output, with Saudi Arabia, Algeria and Iraq as its main customers. In Morocco, total local production capacity covers 65% of the domestic market, against only 10% for export. Generics, and more recently biosimilars<sup>133</sup>, cover nearly 80% of the local needs of the public sector and 25% of the local private market. Finally, in Tunisia, production capacity covered 55% of the local market in 2019, against only 14% in 1990, with a potential export of 12% of production to Africa and Europe.

Moreover, other indicators testify to the potential of this sector in the countries studied. For example, the value added of the sector grew by more than 45% in Tunisia over the period 2015-2019, with an average contribution of 2% to GDP over the period 2015-2019 and the creation of 8 800 additional jobs in 2018. In Morocco, the value added of the sector represented on average 1.5% of GDP over the period 2015-2019.

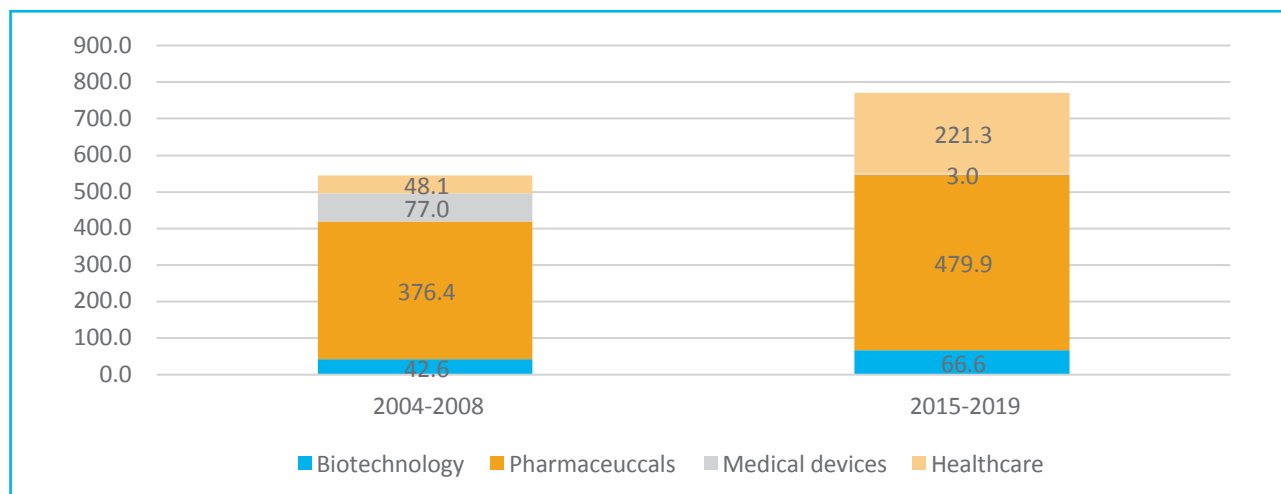
As presented in the first part of this chapter, the Covid-19 pandemic has tested the health systems of countries in the Mediterranean region, although the situation differs from country to country. Nevertheless, the overall resilience of the pharmaceutical industry sector during

the Covid-19 crisis in the Mediterranean countries was strengthened by health policies to respond to the crisis. Despite the fact that the first and second waves of the epidemic put a strain on public hospitals in these countries, the reduced capacity of health systems to cope with a large-scale pandemic led governments to adopt strict regulatory measures. Along with the proactive measures taken to contain the spread of the virus, the contribution of the pharmaceutical industries was crucial in limiting the spread and supplying health systems with essential supplies, both health and pharmaceutical products, considered strategic during the Covid-19 pandemic crisis.

Despite the relative weaknesses of the health systems in the target Mediterranean countries, the production capacity of their pharmaceutical industries has been growing significantly for several years, thanks to the large amount of foreign direct investment (FDI) they have received. When considering the five countries studied as a whole, Figure III.12 shows that in ten years, incoming FDI increased by almost 42%, from a total of US\$544.1 million over the period 2004-2008 to US\$770.8 million between 2015-2019. The increased FDI inflows were in biotechnology, pharmaceuticals and healthcare. In contrast, for health equipment, FDI inflows have declined from \$77 million over 2004-2008 to \$3 million over the last 4 years.

133 A similar biological medicinal product (“biosimilar”) is one with the same qualitative and quantitative composition in terms of active substance and the same pharmaceutical form as a reference biological medicinal product, but which does not meet the conditions for being considered as a generic specialty due to differences linked in particular to the variability of the raw material or the manufacturing processes. These differences require that, in order to obtain marketing authorization, the biosimilar medicinal product must produce additional pre-clinical and clinical data compared to those required to obtain marketing authorization for a generic medicinal product.

**Figure III.12. Inward FDI in health-related industries (USD million)**



Source: OECD (2020)

Note: Aggregate data for Algeria, Egypt, Jordan, Morocco and Tunisia.

The organization of the pharmaceutical sector in the target countries follows different models of private sector involvement. With the exception of Morocco, where the private sector is the main driving force behind the development of the pharmaceutical industry, with the presence of multinational drug companies, the organization of the sector in the other countries of the region follows a hybrid model, with the State remaining an influential player in its function of regulating the system, and the more or less significant participation of private operators.

In Algeria, the public sector was predominant and the number of private operators was limited. However, since 2008, the drug production sector, previously dominated by the public company SAIDAL, has seen the entry of several private operators, such as Biopharm and Hikma Laboratories (a Jordanian pharmaceutical group), encouraged by incentives from the authorities in favor of private,

domestic and foreign investments. The pharmaceutical industry sector has been classified among the strategic sectors and was even the subject of the creation of a sectoral ministry in June 2020.

In Egypt, multinational companies (such as Servier, Novartis, Pfizer, Merck and Sanofi Aventis) account for about 30% of local sales of locally manufactured products and 35% of imported products under license. Importers are almost exclusively multinationals in the sector, and to a lesser extent agents of pharmaceutical companies without subsidiaries in the country.

In Jordan, and following the example of the other target Mediterranean countries, private operators in the pharmaceutical sector have established business links with the leading companies, including Pfizer, Roche, Mundipharma, Aventis, Novartis, Organon, Fujisawa, Takeda, and produce essentially generic drugs.

In Tunisia, despite the importance of private actors, the cohabitation of the public sector remains apparent at several levels: (i) the regulatory and control structures (Directorate of Pharmacy and Medicines - DPM, National Centre for Pharmacovigilance - CNPV and the National Laboratory for the Control of Medicines - LNCM), (ii) the Ministry of Health, for marketing authorizations after evaluation by the various technical and administrative commissions, (iii) the Medicines Purchasing Commission (CAM), formed by the Ministries of Health and Trade, responsible for setting the public prices of imported and locally produced medicines for the pharmacy circuit, with the Central Pharmacy of Tunisia (PCT) holding the monopoly on the import of medicines, and (iv) the supply structures. Production is largely delegated to the private sector, the public sector only intervening through a subsidiary of the PCT, the company SIPHAT. And even if there are important domestic industrialists, the main private operators are multinationals, established as subsidiaries or joint ventures with local partners.

### III.2. New opportunities for the pharmaceutical industry due to the pandemic

#### III.2.1. Opportunities related to disruptions in the global pharmaceutical supply chain

The Covid-19 crisis has highlighted the vulnerability of international pharmaceutical supply chains due to heavy dependence on China and India.

China is the world's largest producer of raw materials<sup>134</sup> (these raw materials are known as active pharmaceutical ingredients), while India, which buys 70% of these active pharmaceutical ingredients from China, produces both licensed drugs for large European and American companies and generic drugs, for which it is the world leader. India thus supplies the bulk of the generics consumed in developing and emerging countries.

The supply shortages experienced during the pandemic, including for products needed to combat Covid-19, could lead private (and public) sector operators in both Europe, the Mediterranean and SSA to readjust their supply chains outside China and India. For example, the active ingredients of antigenic and PCR tests are manufactured mainly in China and to a lesser extent in South Korea and the USA.

The reliance on foreign suppliers was, for example, the cause of a shortage of reagents for PCR tests in France during the last quarter of 2020. The French company Biosynex, one of the main players in Europe in the Covid-19 testing market (PCR, antigenic and serological), which until now has imported its antigenic test reagents from China, has decided to manufacture them locally. This is a clear example of opportunities for Mediterranean countries.

The realignment of pharmaceutical supply chains may benefit countries with large domestic markets more than others in the region, particularly

134 For example, China produces 90% of the world's penicillin, 60% of paracetamol and 50% of ibuprofen.

Algeria and Egypt. It is worth noting, for example, that the Russian anti-Covid-19 vaccine (Sputnik V) is expected to be produced in Algeria by the state-owned pharmaceutical group Sidal, mentioned above. This delocalization of vaccine production is planned in two stages: in the first stage, Russia will supply the raw material and in the second, a biotechnological transfer is planned to enable the Algerian laboratory to control the production of the raw material, which will also give it access to the production of other vaccines and medicines. In addition, by end of 2021, Egypt started the production of the Chinese Sinovac vaccine. The vaccine is produced at the Egyptian Holding Company for Biological Products and Vaccines (VACSERA). This aims to fulfill the national demands of vaccines for its large population and to make Egypt a hub for vaccine exports to Africa.

By relying on supply alternatives that are geographically closer, more accessible in times of crisis in terms of costs<sup>135</sup> and in terms of obtaining products<sup>136</sup>, more controllable in terms of quality, more flexible in terms of adapting the quantities produced or changing the formulation, all the countries in the region could benefit from setting up partnerships with European companies. Such partnerships could take the form of input supply contracts, of installing industrial units or of co-production agreements.

The Mediterranean countries have started to reflect on the implications

of a possible new reconfiguration of pharmaceutical industry value chains (Aitken, 2016; Joumard et al., 2018). Egypt, Morocco and Tunisia are already positioning themselves, for example, as preferred destinations for foreign investors considering relocating production from China to the Southern Mediterranean. The region can claim several advantages in the development of the sector. Firstly, it has a productive apparatus whose capacities are admittedly restricted to low complexity activities, but which demonstrates efficient technological appropriation capacities. A second advantage held by the countries of the region derives from the presence of multinational drug companies on their territories. The decision to enter these markets is an indication of their positive understanding of regional opportunities, not only in the short term but also in the long term (Amadeus Institute, 2020).

Moreover, as emphasized in the second chapter of this report, the SEMCs have competitive factor costs compared to other regions of the world, and in particular compared to European countries, and a relatively well-trained workforce. The countries of the region also have the advantage of strategic positioning and privileged access to several major markets (Europe, Sub-Saharan Africa), favorable to the creation of industrial hubs on a regional scale for the relocation of European industries, currently located in Asia. Their intra-regional trade dynamics would be facilitated by the

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135 During the crisis, transport was saturated. In the summer of 2020, prices quadrupled.

136 During the Covid-19 crisis, Asian producers set priorities favoring domestic and neighboring markets.



effectiveness of trade agreements, and essentially those relating to non-tariff barriers and market access obstacles (Augier, 2020), and more sophisticated transport logistics systems.

Under this assumption of increased intra-regional trade, the pharmaceutical industry sector in the countries of the region would be more capable of achieving significant growth in its activities in the post-crisis period. Therefore, and in order to reduce their dependence on global supplies, targeting the pharmaceutical industry sector as one with high development potential is more than appropriate in Mediterranean countries. While exploiting the potential of more efficient linkage to global value chains, the reconfiguration of the latter, making them more regional, opens up not only promising avenues for the internal development of the pharmaceutical industries in these countries, but also vectors for the revival of regional integration in the post-Covid era (Moreno-Dodson, 2020 and World Bank, 2021).

The region's trade potential is not being fully exploited, and delays in the process of trade integration are causing each country in the region to lose additional growth and employment opportunities. The persistence of major obstacles still blocks trade between the countries of the region, as illustrated in particular by (i) the complexity of the network of bilateral free trade agreements and the multiplicity of other regional preferential agreements, (ii) the prevalence of restrictive trade rules, such as sanitary and phytosanitary requirements, and very high customs

tariffs (iii) other market access barriers, both procedural, such as certificates of origin, and non-tariff obstacles, (iv) business climate constraints such as logistical and transport deficits (Mouley et Zekri, 2019).

### III.2.2. Opportunities for upscaling in the face of long-term changes in global value chains

Due to the relatively limited number of components involved in the manufacture of a medicine (active ingredients, excipients, pills and capsules, etc.), the global pharmaceutical value chain is not very fragmented at the production level. On the other hand, it is subject to strong segregation of tasks according to the level of sophistication of the products. In the production phase, a distinction is made between innovator and generic manufacturers. The former are involved in the R&D of patented innovative products (originator drugs), for which they have marketing exclusivity until a predefined patent expiry date.

These players, who carry out the most complex R&D and marketing activities, are generally large multinational pharmaceutical groups. Generic manufacturers, on the other hand, produce medicines based on substances whose intellectual property has fallen into the public domain. Innovative manufacturers also have subsidiaries specializing in generic medicines, which allows them to maintain a presence in the market (Mouley et Verdier, 2019).

Generic medicines are more easily produced locally due to the availability of patents on active ingredients



and knowledge of manufacturing processes and formulas. These medicines, often basic, essentially cover mass diseases. In contrast, innovators are mainly interested in chronic, lesser-known and progressive diseases, which are the subject of intensive biological research. Given the skills and technologies required to perform these tasks, the Mediterranean countries studied are, as already noted, mainly home to generic manufacturers.

The global structure of pharmaceutical production, split between innovators and generics, results in two sectoral growth dynamics. Innovators seek vertical growth, focused on designing innovative molecules with high added value, while generics seek horizontal growth, focused on conquering new markets, in both developed and developing countries. These two strategies are articulated through the generic subsidiaries of large innovator groups, but they require different approaches to the pursuit of industrial competitiveness (Mouley and Verdier, 2019). Because they are engaged in a global innovation race, innovators invest heavily in acquiring technologies and skills in biotechnology, artificial intelligence, automation and telemedicine. Generic companies, on the other hand, are not subject to the same R&D constraints, and focus on increasing sales by improving the production process and seeking economies of scale.

This structure determines the different types of opportunities that exist for Mediterranean countries seeking

to develop their pharmaceutical industries. In addition to reinforcing the production capacities of generic medicines with low added value, other open avenues of development are centered on reinforcing capacities in terms of research and innovation, with a view to producing medicines with higher added value, adapted to the evolution of local needs, and whose local manufacture would make it possible to reduce the bill for medicines in the near future.

This upmarket dynamic, which resides in collaboration with large international groups, could be favored by the emergence of an innovation space in the region, particularly in Mediterranean markets with a skilled workforce (Weinmann, 2008; African Union, 2010; Sedkaoui, 2016). According to the latest 2020 Global Innovation Index ranking, the innovation performance of the target Mediterranean countries, presented in Table III.4, is heterogeneous, but some countries show a high innovation potential: Egypt, Jordan and Tunisia in R&D, Tunisia and Morocco in ICT and Jordan in innovation linkages.

Overall, Tunisia and Morocco rank among the most innovative countries, but generally more efforts are still needed for national innovation systems to accelerate levels of scientific and research activity and openness to technology adoption, and incoming knowledge flows, to reduce dependence on public subsidies as a source of R&D, and to increase the firms' capacity to absorb the pillars of knowledge and skills.

**Table III.4. Regional Innovation Index**

| Scores / Pillars  | Algeria    | Egypt      | Jordan    | Morocco    | Tunisia    |
|---|------------|------------|-----------|------------|------------|
| GII 2020 rank   | 113 (+8)   | 96 (-4)    | 81 (+5)   | 75 (-1)    | 65 (+5)    |
| GII 2019 rank   | 121        | 92         | 86        | 74         | 70         |
| <b>Institutions</b>   | 52.2 (104) | 48.6 (115) | 64.3 (63) | 60.8 (77)  | 61.1 (75)  |
| <b>Human capital and research including: (R&amp;D)</b>          | 28.4 (74)  | 21.5 (90)  | 27.2 (78) | 25.9 (81)  | 40.7 (38)  |
| <b>Infrastructure including: (ICT)</b>                          | 31.5 (100) | 31.5 (99)  | 32.8 (95) | 39.3 (71)  | 38.2 (74)  |
| <b>Market sophistication</b>                                    | 24.6 (130) | 39.3 (106) | 50.1 (52) | 43.3 (88)  | 37.0 (112) |
| <b>Business sophistication including: (Links to innovation)</b> | 15.6 (126) | 18.7 (103) | 20.7 (94) | 18.4 (107) | 18.0 (110) |
| <b>Outputs of knowledge and technology base</b>                 | 8.1 (125)  | 19.7 (65)  | 15.6 (82) | 21.9 (60)  | 25.8 (52)  |
| <b>Creative outputs</b>   | 8.9 (118)  | 13.4 (101) | 17.5 (84) | 19 (75)    | 21.1 (63)  |

Source: *Global Innovation Index (2020)*.

It is therefore essential to anchor the pharmaceutical industry in the national innovation systems. All the countries in the region have structures involved in pharmaceutical research, such as national health institutes and private and public laboratories, some of which operate in biotechnology.

In association with major international pharmaceutical groups, Algeria and Tunisia, for example, have technopoles specializing in biotechnology and a similar center is being set up in Morocco. Similarly, a health technology start-up at the MAScIR research and development center in

Morocco has been able to produce 1 million RT-PCR tests per month. At the same time, Morocco and Egypt have also partnered with China and private companies to support research into the development and distribution of Covid-19 vaccines, which have entered advanced testing stages.

Overall, the equipment and know-how accumulated by the countries in the region provide a solid foundation for industrial progress. Moreover, the inclusion of producers in supply, local marketing and export networks can also help to upgrade or increase production and create local jobs.

### **III.3. Main conclusions and recommendations**

The plans for in-depth restructuring of the health systems in the Mediterranean countries and their upgrading, as the Covid-19 crisis continues, are inseparable from the strategies for developing an innovative and robust pharmaceutical industry in these countries. With the current dynamics and maturity of the regional pharmaceutical market, important avenues seem to emerge from the opportunities for industrial relocation of certain production segments and/or reconfiguration of value chains on the part of multinationals, for a new trend towards regionalizing supply sources in the pharmaceutical sector, or even creating a regional value chain. Our main recommendations are as follows:

#### **1. Create an enabling environment for the structural transformation of the pharmaceutical industry**

Despite the relative weaknesses of their health systems, as the Mediterranean countries under study hold a strong position in the drugs and pharmaceuticals sector, they benefit from large domestic markets, competitive factor costs and accumulated know-how and experience. They would thus benefit from strengthening the presence of foreign industrial units and consolidating the attractiveness of foreign direct investment in this field, in order to create industrial hubs on a regional scale, and in particular for

the relocation of European industries, currently located in Asia.

In this respect, stronger involvement of private sector actors, as the main driver for the development of the pharmaceutical industry, is key. To this end, in addition to specific measures linked to improving incentive and fiscal frameworks to strengthen the attractiveness of foreign investment in the sector, other cross-cutting measures linked to the business and investment climate should be conducted (FEMISE, 2019). Indeed, current underperformance in the region is not only inherent to the still latent restrictions on capital and financial transactions, and constraints on foreign exchange regulations, but also to regulatory rigidity related to the business and financial environment for investment, which has led to the limited dynamism of the private sector in the region and its inertia in contributing to overall investment. Other constraints affecting the competitive environment are primarily attributed to weakness of the efficiency enhancers.<sup>137</sup>

#### **2. Ensure the upgrading of the sector**

The main challenges facing the pharmaceutical industry in the region are to contend with competition from the large international groups established in the basic drugs market, and to upmarket the production of more complex drugs better adapted to the changing needs of regional health. This dual sectoral challenge can be met by establishing a regional drug value chain and anchoring it in a growing regional and continental market.

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137 According to the IGI global these include: higher education and training, the goods market efficiency, the labor market efficiency, the financial market development, the technological preparation, and the market size.

National pharmaceutical innovation strategies should be developed by promoting partnerships between research institutions and the private sector in order to build capacity for truly innovative drug discovery. Finally, the level of scientific training needs to be improved by enhancing student mobility programs in European laboratories, within the framework of scientific cooperation projects at the regional level and between the Mediterranean countries studied and the EU.

### 3. Cooperate at regional level

Interaction between public policies and the development of the pharmaceutical industry also takes place at regional level, insofar as the convergence of drug policies is likely to lead to opportunities for economies of scale for producers. In this context, the extension of domestic markets to a regional scale, for example by harmonizing marketing authorization rules, could produce this effect. Another mechanism that could prove favorable to regional production is a system of joint, pooled purchasing of imported drugs and active ingredients, the list of which would be drawn up jointly by the countries in the region (Mouley and Verdier, 2019).

The creation of a regional Euro-Mediterranean pharmaceutical industry hub is now more than timely in a context of reconfiguration of value chains by multinationals and/or relocation of certain production segments of European industries, currently located in Asia. The countries of the region have the advantage of strategic positioning and privileged access to

several major markets (Europe, Sub-Saharan Africa). There is thus likely to be a trend towards regionalizing supply sources, with a consequent boost to intra-regional trade, which would be all the more facilitated by effective trade agreements, essentially those relating to non-tariff barriers and obstacles to market access (Augier, 2020), and a more sophisticated transport logistics system. A regional Euro-Mediterranean pharmaceutical industry hub could also provide the countries studied with the opportunity to form a common regional bloc for negotiating potential agreements in the field of health and medicines with the EU, which would better position the region in a reconfigured global market.

The construction of a regional innovation space, driven by cooperation between research centers, pharmaceutical companies, innovative start-ups and industrialists, around projects focused on common health challenges, would also enhance the international attractiveness of the region.

## IV. Conclusions

This study draws a picture of three specific elements: i. how health systems in the Med region reacted to the Covid-19 crisis and what needs to be improved, ii. the capacity of digital technology to improve and make health systems more efficient and iii. how the context of the pandemic may offer new prospects for the development of the pharmaceutical industry in the SEMCs. For an efficient health sector, one that offers a better response to pandemics but also to the day-to-day needs of



populations, these three elements should not be approached in isolation, but rather as part of a holistic vision. The three are interrelated, specifically:

- The response to the health crisis must rely on all the stakeholders involved in the country's health system, and in particular on private stakeholders in the production of health care and services or health insurance (private structures, private doctors, pharmacists, nurses, community health workers, mutual health insurance), as well as on private and public stakeholders in pharmaceutical production.
- Digital technologies also present a significant potential for the development of the pharmaceuticals sector. Promising modern technology such as Blockchain, where information is protected from modification, seems particularly relevant<sup>137</sup>. This technology ensures that information cannot be falsified which means the sale of substandard medicines will be excluded through the control of all elements of the production, logistics and sales chains. National registries of medical information on patients can also be created making it easier, quicker and less expensive to undertake research and develop new medicines. Transparency of financial flows in healthcare, especially in its public sector, can also be significantly improved. Last but not least, government spending on quality control of medicines can be reduced, as such costs could instead be carried by pharmaceutical companies that are interested in promoting their products.
- Linking the distribution of insurance products with digital tools (e.g., through mobile phone subscriptions) could also be a means to reach lower-income and excluded populations<sup>138</sup> of South SEMCs, simultaneously providing them with a product and a method of payment. Innovation leveraging mobile-enabled technology has the potential to provide:
  - o Growth for insurers through greater customer access, something which could potentially lead to increasing the size of the SEMCs market,
  - o Greater personalization and fairer premiums for customers, which is particularly relevant for the SEMCs' populations and
  - o New ways of interaction that are not only cheaper but also faster and more reliable.
- It is important that the countries of the region cooperate, at the level of the health systems themselves, at the level of the elaboration and implementation of digital tools, and also at the level of the development of a robust pharmaceutical sector, probably starting with sub-regional areas (Maghreb, Mashrek, for example) which are characterized by more homogeneous health systems and demographics.

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138 Vladimir Plotnikov and Valentina Kuznetsova (2018), "The Prospects for the Use of Digital Technology "Blockchain" in the Pharmaceutical Market ", MATEC Web Conf., 193 (2018) 02029  
DOI: <https://doi.org/10.1051/mateconf/201819302029>

139 <https://riskinfo.com.au/news/2011/07/28/mobile-phones-to-boost-insurance-sales/>



Finally, digital technology must be integrated into a global reflection on how to best improve health systems, as a tool that would be adapted to the needs, constraints and contexts of Mediterranean countries. Moreover, in order to deal with health crises such as Covid-19, the successful development of a pharmaceutical industry capable of manufacturing, on a regional scale, the products that populations might need, would mark a great achievement for cooperation.

## References

- Aitken, M. (2016) Understanding the pharmaceutical value chain, *Pharmaceuticals Policy and Law*, Vol.18, No. (1-4), pp. 55-66.
- Augier, P (2020), *Convergence des cadres de commerce et d'investissement dans les pays du Maghreb* (Sous la Coordination Scientifique de Mouley, S), Banque Africaine de Développement et Banque Magrébine d'Investissement et de Commerce Extérieur, Eds.
- Blair I, Grivna M, Ahmad Sharif A. (2014) The “Arab World” is not a useful concept when addressing challenges to Public Health, Public Health Education, and Research in the Middle East. *Front Public Health*, 2:30 10.3389/fpubh.2014.00030
- Bloom, D. E., Canning, D., & Weston, M. (2005). The value of vaccination. *World Economics*, 6(3), 15.
- Caldwell, J. C. (2001). Population health in transition. *Bulletin of the World Health Organization*, 79, 159-160.
- Camara M, D'Almeida C, Orsi F, Coriat B. Procurement Policies, Governance models and availability of ARVs in some African Francophone countries. In: Coriat B, Ed, *The Political Economy of HIV/AIDS in developing Countries TRIPs, Public Health Systems and Fee Access*. Edward Edgar Publisher, London, 2008, 225-54.
- Colvin, C. J. (2011). HIV/AIDS, chronic diseases and globalization. *Globalization and health*, 7(1), 31.

- DeJong, C., Katz, M. H., & Covinsky, K. (2020). Deferral of Care for Serious Non-COVID-19 Conditions: A Hidden Harm of COVID-19. *JAMA Internal Medicine*.
- Deslandes, R., Evans, A., Baker, S., Hodson, K., Mantzourani, E., Price, K. & Hughes, L. (2020). Community pharmacists at the heart of public health: A longitudinal evaluation of the community pharmacy influenza vaccination service. *Research in Social and Administrative Pharmacy*, 16(4), 497-502.
- Femise (2019), Le secteur privé dans les pays méditerranéens: Principaux dysfonctionnements et opportunités de l'entrepreneuriat social; (Sous la Coordination de P. Augier), Mouley, S, Tsakas, C et al.
- Institut Amadeus (2020), Maroc: Adaptation, innovation, agilité, créativité et efficacité: les 5 piliers de la relance et de la construction du modèle de développement national post covid.
- Joumard I., Dhaoui S. & Morgavi H. (2018), Insertion de la Tunisie dans les chaînes de valeur mondiales et rôle des entreprises offshore, Documents de travail du Département des Affaires économiques de l'OCDE, No. 1478.
- Kamel, M. I. (2020). A view of the health services after COVID-19: an Egyptian perspective. *Alexandria Journal of Medicine*, 56(1), 118-129.
- Mathonnat, J. (2009). Système de santé et accès aux soins dans les pays à faible revenu, in Bras P.L., Tabuteau G., Pouvourville G., *Traité d'économie et de gestion de la santé*, Presses de ScPo, Paris.
- Mercier, G., Arquizan, C., & Roubille, F. (2020). Understanding the effects of COVID-19 on health care and systems. *The Lancet Public Health*, 5(10), e524.
- Moreno-Dodson, B. (2020), *Enhancing Mediterranean Integration*, CMI - World Bank.
- Mouley, S et A. Verdier (2019), *Rapport sur l'intégration régionale au Maghreb: défis et opportunités du secteur privé*, Banque Africaine de Développement et Banque Magrébine d'Investissement et de Commerce Extérieur, Eds.
- Mouley, S et N. Zekri (2019), *Intégration Financière Régionale au Maghreb et Rôle Stratégique de la Banque Maghrébine d'Investissement et de Commerce Extérieur*, *Revue d'Economie Financière*, Vol.4, N°136.
- Mouley, S (2020), *Impacts économiques, financiers et sectoriels de la crise de la pandémie du Covid-19 sur les pays du Maghreb: Quelles stratégies de sortie de crise, quels scénarii de résilience à moyen terme et quels nouveaux enjeux pour l'intégration Maghrébine ?* Technical Policy Report, Banque Magrébine d'Investissement et de Commerce Extérieur, Eds.

- Murray, C. J., Aravkin, A. Y., Zheng, P., Abbafati, C., Abbas, K. M., Abbasi-Kangevari, M., & Abegaz, K. H. (2020). Global burden of 87 risk factors in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019, *The Lancet*, 396(10258), 1223-1249.
- Omran, A. R. (1971). The epidemiologic transition: a theory of the epidemiology of population change. *The Milbank Memorial Fund Quarterly*, 49, 509-538.
- Ridde, V. (2004). L'initiative de Bamako 15 ans apres - un agenda inachevé (French). HNP discussion paper Washington, D.C.: World Bank Group. <http://documents.worldbank.org/curated/en/417091468763473890/Linitiative-de-Bamako-15-ans-apres-un-agenda-inacheve>
- Rodrik, Dani (1996), "Understanding Economic Policy Reform," *Journal of Economic Literature*, 24 (1): 9-41.
- Sanders, J. W., Fuhrer, G. S., Johnson, M. D., & Riddle, M. S. (2008). The epidemiological transition: the current status of infectious diseases in the developed world versus the developing world. *Science progress*, 91(1), 1-37
- Sawaya, T., Ballouz, T., Zaraket, H., & Rizk, N. (2020). Coronavirus Disease (COVID-19) in the Middle East: A Call for a Unified Response. *Frontiers in Public Health*, 8.
- Sedkaoui, S. (2016) "Les obstacles au processus d'innovation. Etude empirique basée sur un échantillon d'entreprises pharmaceutiques algériennes, Marché et organisations", vol. 26, No. 2, pp. 121-152.
- Tachfouti N, Slama K, Berraho M, Nejari C. The impact of knowledge and attitudes on adherence to tuberculosis treatment: a case-control study in a Moroccan region. *Pan Afr Med J*. 2012;12:52
- Thomas S, Sagan A, Larkin J, Cylus J, Figueras J, Karanikolos M. Strengthening health systems resilience: Key concepts and strategies [Internet]. Copenhagen (Denmark): European Observatory on Health Systems and Policies; 2020. PMID: 32716618.
- Union Africaine (2010), Renforcer l'innovation pharmaceutique en Afrique: Élaborer des stratégies nationales d'innovation pharmaceutique.
- Weinmann, N. (2008), R&D des compagnies pharmaceutiques: ruptures et mutations, Direction Générale des Entreprises, Observatoire des Stratégies Industrielles, Mission Prospective.

