New version 05 November 2020

Agricultural land issues in the Middle East and North Africa[1]

By
Rafaelle Bertini (IOM, Cairo, Egypt) and Abdallah Zouache (Sciences Po Lille, France)
Contact: abdallah.zouache@sciencespo-lille.eu

Abstract
The originality of this article is to deal with agricultural land issues in the Middle East and North Africa, which is rare in the academic works on this region. The article provides an analysis of structural and institutional weaknesses of agricultural land in the MENA. One main result is to offer a comprehensive understanding of the distribution of agricultural land in MENA countries, either in terms of structure, and of ownership. Another result is to furnish an empirical pattern of farmland distribution and farm land area in the MENA countries.

Keywords: land, agriculture, distribution, farm, MENA

JEL Codes: 013, 053, 055, Q15, Q24

1 We thank two anonymous referees whose reports helped us to substantially improve the previous version. We remain responsible of the remaining errors and weaknesses.

1. Introduction

The analysis of agricultural land is related to the literature on structural change and economic development. The literature dealing with structural change is abundant, but the fundamental framework can be understood from the contributions of illustrious economists who have approached the question at the theoretical and empirical level, Samir Amin and Arthur Lewis. Development is growth accompanied by a transformation of economic structures (Amin, 1972). Economic progress in the agricultural sector is a necessary condition for a process of industrialization of the economy for several reasons. The agricultural sector employs a large part of the active population, it is an outlet for industry, allows the rural exodus by feeding the urban population, and avoids a trade imbalance of an economy dependent on imports (Amin, 1972, p. . 474). In addition, the agricultural sector provides a surplus that can be reinvested in a domestic industry that could not emerge if it depends on international investment. Arthur Lewis' contribution (1954), at the origin of the theory of surplus, and inspired by classical political economy, insists on the role of the surplus of agricultural labor in generating profits favoring a dynamics of capital accumulation in a dual economy where a structural surplus of labor coexists and a capitalist sector in gestation. In this tradition, economic dynamics depends on the share of profit in relation to wages and ground rent. In a developing economy, the agricultural sector being not very productive, the absorption of labor has no perverse effect on agricultural production, especially if there is a sustained demographic dynamic. At a certain stage of development, the agricultural sector loses its importance, also because it has become more productive, more intensive, it employs less labor and industry, then the tertiary sector, become the economic engines in terms of production, jobs, and surplus. Insufficient progress in the agricultural sector slows down or even prevents self-centered, national industrialization and, for some authors, this is a major cause of the persistence of underdevelopment (Amin, 1972, p. 474).

Samir Amin's contribution is not limited to a macroeconomic and global vision of the relationship between agricultural dynamics and whole economic dynamics. It shows, in particular, the role of social structures of production in structuring the agricultural sector. Amin relates the progress of productivity in the agricultural sector and the development of agrarian capitalism in Sub-Saharan Africa. Without going into the details of the analysis, we retain from Amin's contribution that structural transformations at the macroeconomic and sectoral levels depend on, or are related to, the mode of agricultural production and to the property system related to it. To use Samir Amin's words, self-centred (national) development requires local production, and therefore appropriate agricultural production structures.

International institutions, as well as recent literature in rural economics (Bosc and Beliere, 2015), adopt this microeconomic posture. Thus, the United Nations General Assembly declared 2014 to be the international year of family farming, recalling that family farming was both the typical place of malnutrition and the best way to fight it. According to the United Nations, globally, 500 million family farms represent 40% of the working population and 80% of food production so that, recently, 2019-2028 has been declared the decade for family farming (FIDA/FAO, 2019). At this level of analysis, it is crucial to question the structural change at the level of the structures of agricultural holdings, of their form of organization because they directly impact the performance in agricultural production but also the structural dynamics of agriculture. It is particularly important for rural economists to examine the role of family property in the production system, especially in developed countries (Courleux et al. 2017). In the issue of a developing economy, one of the major challenges is the weight of small structures, more extensive compared to large intensive structures, the weight of the family dimension but also the distribution of agricultural land between forms of exploitation. It is also crucial to question the type of property rights, the famous tenures, and

agricultural policies carried out by national authorities (Chang, 2009).

Challenges facing Middle Eastern and Northern African (MENA)[2] countries clearly appeals to both issues. At the macro level, these countries suffer from low economic performance, low level of GDP per capita and low level of agricultural productivity. At the sectoral level, the agriculture production is not efficient, and most countries are dependent from export to feed their population. Even in rich small hydrocarbon producers (Qatar, UAE, Kuwait), food security is challenged. MENA agricultural weaknesses and fragile performance go with a low level of industrialization. Despite the efforts of certain countries, the MENA countries, at the exception of Turkey, have not succeeded yet in transforming the structure of their economies. MENA countries are not industrialized. Their economies are not diversified. MENA countries participate to global trade via the exports of natural products, mainly gas and oil, but are not actors of the global industrialized networks (OECD, 2018). The standard explanatory hypothesis to development failures in MENA countries is the curse of natural resources (Ross et al., 2011). This paper will test another assumption: the lack of agricultural structural transformation has also an impact on the economic transition in the MENA countries because the economic mechanisms of structural change described above could not be launched. In other words, why the MENA region has not experienced a structural transformation process in the agricultural sector?

To respond to this question, this article will adopt a land angle. We will not have space to deal with all challenges related to land agricultural issues in the MENA region and will propose, accordingly, two explanatory routes. The first is to examine the main structural characteristics of agricultural land in the Middle East and North Africa in order both to give an overview of the agricultural situation in the countries for which data is available and to identify the specific constraints that the region endures. Section 2 will thus adopt a macro structural posture and review the structural weaknesses in the MENA countries that help to explain the lack and difficulty of a structural change dynamics in other sectors. The second route is institutionalist in the sense that it will examine the property structure related to agricultural land issues. Section 3 investigates the institutionalist feature, especially the forms of land property and land tenures, that might help to explain the difficulty of an agricultural transition in the MENA countries. Section 4 will focus on agricultural land distribution in order to highlight how it contribute to the explanation of a low economic performance in the agriculture sector, and, indirectly, to the difficulty of having a structural transformation of the MENA economies. One specific contribution of this article is to analyze the agricultural land distribution in selected MENA countries as regards as the ownership of this agricultural land in terms of share of holdings and share of farmland by land size. The final section concludes.

2. Structure of Agriculture in the Middle East and North Africa

Middle Eastern and Northern African countries changed the structures and basic characteristics of agricultural systems in the Middle Eastern and Northern African countries, leading to certain improvements.[3] Agricultural land as share of the total amount of land in the region increased from 32 percent of the land area in 1991 to 37 percent in 2016. In terms of contribution to GDP, the value added of agriculture, forestry and fishing was halved from about 10 percent of GDP in 1990 to about 5 percent in 2019. Agriculture employment has dropped in the Arab World from 35 percent

2 The definition of the Middle East and North Africa differs between institutions, and research on MENA countries depends on data availability. We retain the World Bank's view. It includes Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates, West Bank and Gaza, Yemen, to which we add Turkey. We also include in the global overview (section 2) members of the Arab League (Mauritania, Comoros, Djibouti, Somalia).

3 We thank one referee for pointing out this aspect. The figures are taken from her/his report.

of total employment in 1991 to 20 percent in 2019, according to ILO models. The use of capital in agriculture has increased from 97.4 tractors per 100 square kilometers of arable land in 1991 to about 154 in 2000. Quite interestingly, in Egypt, the number of tractors increased from 250 in 1990 to about 390 in 2008. In Lebanon, the numbers grew from 175 in 1990 to 640 in 1999. Despite these recent improvements, the main picture in this region reveal structural weaknesses and heavy constraints. We hereafter insist on four main issues related to the structural weaknesses of MENA land agricultural economy.

Table 1 MENA main agricultural indicators

Countries	Agricultural land (% of total land area 2014)	Arable Land (% of total land area 2014)	Self-Sufficiency Ratio (2013)	Share in Total Employment (2010-2014)	Share in GDP (2010-2014)
Qatar	6	1	3	1.4	0.1
United Arab Emirates	5	0		3.8	0.8
Kuwait	9	1		2.2	0.5
Bahrain	11	2		1.1	0.3
Saudi Arabia	81	2	33	4.7	2.7
Oman	5	0	5	5.2	1.4
Lebanon	64	13	41	6.8	3.1
Iraq	21	12	54	23.4	3.8
Libya	9	1		19.7	2.2
Iran, Islamic Rep.	28	9	85	18.9	5.6
Algeria	17	3	64	10.8	11.9
Tunisia	65	19	75	15.6	9.9
Jordan	12	3	38	19	3.2
Egypt, Arab Rep.	4	3	72	28.1	13.7
Morocco	69	18	80	39.4	15.6
Palestinian Authority	50	11	16	11.8	4.5
Sudan	29	8	85	44.6	37.9
Syrian Arab Republic	76	25		19.9	18.8
Yemen, Rep.	45	2	50	24.7	15.0
Mauritania	39	0.4		50.4	30.3
Djibouti	65			74.1	3.8
Comoros	66			69.6	44.5
Somalia	70			66.4	63.0

Notes. Data comes from OCDE/FAO (2018). Arable land includes land under temporary crops, temporary meadows, kitchen gardens, and land temporarily fallow. Agricultural land includes arable land, as well as land under permanent crops, and under permanent pastures. The self-sufficiency ratio is in value terms: (value of gross agricultural production in current US dollar)*100/(value of gross agricultural production in current US dollars + value of imports in current US dollars-value of exports in current US dollars).

The first issue deals with the nature of land. This issue is obviously “natural” when one reminds the geography of the MENA region, but it has also an economic and sociological dimension. Firstly, it

should be reminded that less than 5% of land is arable in two-thirds of the countries of the region, while many countries (Saudi Arabia, Lebanon, Tunisia, Morocco, Yemen, Mauritania and Syria) have huge desert pastures for livestock grazing. Of all the land in the area, one third is agricultural land (cropland and pastures) of which only 5% is arable (OECD/FAO, 2018, p. 70). In addition, the cultivated land (cropland) requires strong irrigation (about 40%). Cultivable soils are of very poor qualities, mainly due to irrigation which causes a salinization of land, but also because of erosion and climatic conditions. One main economic dimension of the land issue concerns productivity which is globally low compared to other large regions even if it depends on the production - they are better for fruits than for cereals - and the country - Egypt or Jordan showing higher productivity than the MENA average. Finally, landholding is unequal and is based on an uneven farm size distribution across the region.

The second issue is related to the water drama in the region. The region is the most water-stressed in the world, and climate change will not help to improve the situation. According to the FAO (OECD/FAO, 2018), only Iran, Iraq and Mauritania exceed the renewal threshold for water resources of 1000 m3 per capita per annum and given that the agricultural sector is the principal source of water consumption in the zone. In this context, the low productivity of water uses[4] in agriculture is highly problematic (ibid.).

The third challenge is agricultural policies. MENA agricultural policies are an essential part of the post-colonial state state-led development strategy. In particular, in former-socialist Arab states, mainly Egypt, Algeria, Sudan, Yemen, Syria and Iraq, one main challenge was to modify the national production system through social change on the impulse of the State, in order to facilitate the transfer of land from the land *bourgeoisie* to the revolutionary peasant and rural populations[5]. MENA states also intervened directly in the commercialization of cereals, oil and sugar and provided support to farmers and agro-industries (FAO, 2018, p. 30). Despite the policy reforms in the 1980s and 1990s (ibid.), the MENA countries still strongly support the agriculture sector via two kind of policies: firstly, standard protectionist policies (guaranteed prices, import tariffs) that are led with the objective to lower domestic prices and to increase import prices and secondly, social policies whose aim is to respond to the essential needs of the population in terms of products of first necessity (water, bread, oil, sugar, wheat; as well as energy products). These policies should also be interpreted politically, since their purpose is to avoid hunger riots that could endanger political stability and, in this sense, they are basic components of the MENA welfare state (Malik and Awadallah, 2013).

MENA agricultural policies are inappropriate for different reasons. The first argument is the inconsistency between subsidies policy and the availability of natural resources – land and water. Despite water scarcity, the region has the lowest water prices in the world and spends massive resources on water subsidies (about 2% of GDP). Besides, it has the lowest water tariffs in the world. For instance, while fruits and vegetables both consume less water and provide higher economic returns, about 60% of cultivated land remains in water-consuming cereals, even though most countries in the region have a comparative advantage in the export of fruits and vegetables. A key reason for the seeming inconsistency between policy and water scarcity is political, in this case the concern for food security that involves reducing imports dependence, particularly for cereals. An efficient distribution of these scarce resources will lead to better allocation and more productive allocation of these resources.

The second argument insists on the cost of social programs in MENA countries that are mainly

4 Total water productivity is estimated as half of the world average. Water productivity measures the value of production per unit of water used (see FAO estimates in FAO/OECD, 2018, table 2.5, p. 75).

5 See Bessaoud (1980) on Algeria and Abdel-Malek (1962) on Egypt.

composed of energy and food subsidies, and which involves a fiscal burden (Sdralevich et al., 2014). Countries in the region spend 5.7% of their GDP on subsidies, to be compared with 1.7 % in developing countries (Ramadan, 2018). There are differences between countries. Food subsidies are less costly than electricity and fuel subsidies: in 2011, in nine MENA countries, they represented less than 1% of GDP, but more than 2% in Egypt, Syria, and Iraq (Sdralevich et a, 2014, p.12). Gulf countries spend less on food subsidies than North African and Levant countries (Syria, Iraq, Lebanon). According to the IMF (2014, p. 18), food subsidies are better targeted than energy subsidies. In this sense, they have a better social impact, since they benefit more to poors than fuel subsidies. Food subsidies allow to diminish undernourishment and the prevalence of anemia among children under five years old (Ramadan, 2018) but they also benefit to the middle class and to the rich population (OECD, 2018).

The fourth feature of the MENA land system is food security which is derived from agricultural production. Agriculture is still an important part of the regional economy even though it faces structural issues as water and available agricultural land scarcity. Various North African countries are highly reliant on agriculture like Egypt, Morocco and Tunisia and in some of them agricultural production is also part of the broader value chains in many other economic sectors such as food processing and retail systems. The contribution of agriculture to overall Gross Domestic Product varies greatly across these nations from about 3% in Saudi Arabia to 14% in Egypt (see table 1). Nevertheless, in most countries agriculture's value added as percentage of GDP is in less than 10 per cent while in oil producing countries as Libya and the Gulf countries it is at 2 per cent or below.

Furthermore, agriculture still provides a substantial proportion of employment in the region (see table 1). In several countries - Egypt, Libya, Iran, Syria, Morocco, and also the members of the Arab League Mauritania, Djibouti, Comoros and Somalia -, the rural population represents a relatively large proportion of the total, but agriculture's contribution to value added is comparatively limited (see table 1). In Sudan and Yemen, where most of the population still live in rural areas, agriculture's contribution to employment and value added trails behind (FAO, State of Food and Agriculture 2017). This points to low productivity and hidden unemployment in the countryside. In a substantially urbanized country like Turkey, for example, 30 per cent of the labor force still works in agriculture but contribute for only around 9 per cent of the value added.

In the MENA region, agricultural production is dominated by cereals which, under the impulse of policies that aim to diminish food dependency, represent around 60% of cultivated lands, particularly in poor Arab countries (Yemen, Sudan, Mauritania). Yet, horticulture is the most productive sector and the most integrated to global trade. Egypt and Iran provide 50% of the total value of agricultural production, followed by Sudan, Morocco and Algeria (27%), the other MENA countries (excluding Turkey) contributing to 23% of the total production. Accordingly, Turkey, Egypt and Iran are the three "giants" of the MENA zone in terms of agricultural production. Three other North African countries, Morocco, Tunisia and Algeria, and one Sub-Saharan country, Sudan, could be seen as intermediary agricultural states, the Gulf countries being a less important agricultural actor.

The next section will focus on the farming system that is intimately connected to these four dimensions. Indeed, the farming system is dependent on the water and resources constraints, conditions the reactions to climate changes (OECD/FAO, 2018, p. 76), and has an impact of agricultural productivity, food security, and, for this last reason, is often a political concern for the national authorities.

3. Institutionalist issues: Land distribution and property structure

This section examines the institutionalist features that might help to explain the difficulty of an

agricultural transition in the MENA countries. In the case of agriculture, a key dimension is land tenure and the kind of ownership it involves. The institutionalist literature on underdevelopment in the MENA countries highlights the legacy of Islamic law that would prevent the emergence of a modern and efficient institutional matrix in this region, and particularly the establishment of private property rights (Kuran, 2011). We will first show that this thesis has not theoretical and empirical foundations. One consequence is that the standard institutionalist concept of property right does not seem appropriate to analyze agricultural land issues in the MENA region. Accordingly, we have opted for the standard approach in agricultural economics and will offer a structural approach of land distribution through the issues of ownership. Land distribution will, in a second step, be examined through the measure of farm distribution and farming systems in order to see if the MENA farming systems have evolved towards a concentration of ownership and property. We will then provide an empirical picture of the structure of agricultural ownership in the MENA countries for which we have available data.

3.1. Land tenure and agricultural ownership

Land tenure is a complex topic in the region because of a lack of accurate legal information on the whole of MENA countries, and because of a cultural bias when the question of property rights is examined in the academic literature. Indeed, property rights in the MENA countries are often grasped with religious glasses. Islamic law would be the main source of legislation and land would be ruled by customs laws. The principal argument in this conception concerns the land tenure system which, in the Islamic tradition, would involve that land is collectively owned and that private ownership is not the rule. One obvious implication of that vision is that it is difficult, even impossible, to analyze land ownership without a concise presentation of the Islamic land tenure system. Another consequence is that a measure of land ownership, of its distribution among farmers, would be, if not impossible, useless. Cobham and Zouache (2020) have shown that this culturalist conception of property rights in MENA countries has no theoretical and historical foundations. The situation of land tenure in MENA countries is more complex than what is generally presented in the academic literature, especially when we look at what occurs in the economic and political reality, and if we look at data when they exist.

On the economic reality, a comprehension of land tenure should put aside religious glasses and replace them by historical and political ones. Land tenures in MENA countries have been influenced by the colonial powers, mainly France, Italy and United Kingdom in that zone, which expropriated the natives in order to redistribute the best lands to settlers, either brutally by force or legally through a legal system which justified the transfer of land from private persons or collective institutions to the State, being the army or an administration under the control of the metropole. At independence, the emerging nations did not automatically cancel this aspect, and the independent states have also taken control of land, either on the form of nationalization, socialization or in the form of a legislation; also in the view of redistributing to other parts of the population, either the rural one in case of agrarian revolution, or to the post-colonial elite. What should be retained, in our view, is that private property has gradually become the rule in MENA land tenure systems, and that the legislation is implemented in the context of a patrimonial relationship between the economic elites and the State. This view does not make honour to a more complex and heterogeneous picture that depended on countries, their former land structures, the political conflicts they knew or are living, and on the colonizer[6]. We can nevertheless give examples that illustrate our argument, based on large countries in the zone, in terms of population and of agricultural production.

In Sudan, the 1990 land reform law did not break the colonial British principle according to which the non-registered land should be regarded as relating to the ownership of the State. Likewise, land fragmentation in Iran could be explained, at first, by the Islamic law of inheritance that involves that

6 John Rae (2002) provides a detailed presentation of land tenure in many MENA countries.

land should be inherited by all (numerous) heirs, but the 1962-1971 land reform had a great impact on the structure of land ownership (Barati and al ., 2020). Sociological and economic factors, a social distributive structure and the lack of a land market, also explain the Iranian land tenure system (ibid.). In Algeria, the French, after the confiscation of lands, organized at several periods land tenures that led to the 1897 land tenure system (Bouvier, 1898). The Algerian revolution had the objective of redistributing the land to the Algerians, but post-colonial legislation suggests the return of lands abandoned by French settlers to the former owners and put it under the control of the walis, representative of the State (Belhimer, 2015). In this sense, property was collective, not because of the persistence of an Islamic law, but because of the socialist nature of the independent nation. The agrarian revolution, acted under the 1971 ordinance that gave the possibility of transferring the land to 90,000 peasants (Belhimer, 2015) also provided a framework for private property. In the recent period, and especially after the IMF structural adjustment program, the 1996 constitution, and the land tenure legislation that followed, put private property as the foundation of land tenure in Algeria, but a private property confined to the relation between the redistributive State and the entrepreneurial bourgeoisie (Belhimer, 2015). In Egypt, the land tenure system depended on the British rule rather than Islamic law in colonial times. The Egyptian monarchy, under the British control, was based on a Parliament composed of many big landowners. 2145 relatively large landowner (property size superior to 84 ha) owned 35% of the cultivated land, the rest being share among 2,574,035 small owners (Pissot, 1958, p. 33). The 1952 agrarian reform aimed to redistribute land in order to destroy the political basis of the old regime[7]. That led to a fragmentation of agricultural lands (ibid.). Private property became the basis for land registration since the independence (Sims, 2016). The main issue seems to be not the persistence of Islamic land tenure systems but rather the development of semi-informal or informal land tenure systems (Sims, 2016). Private property seems the rule in the MENA countries. In order to confirm this brief institutional analysis, we have searched the available information on land tenure in census.

We have found land tenure information in seven countries (see table 2). We have examined the legal status of the agricultural land and the result is that private property is the main way of recording land tenure in the MENA countries. Most agricultural landowners are private farmers regardless of the country. When we look at land distribution, farmland is still largely owned by civil/private owners even if the number lowers to values between 90 and 95, compare to 99 in the case of the number of holdings. Morocco and Yemen are peculiar cases. Presence of different property and tenure systems as well as the role of other players in the Moroccan agricultural sector, notably the government, and of more traditional tenure systems in Yemen might explain the reported data. The only country for which we have time data is Egypt where we can quite interestingly observe a slight concentration process towards other types of property systems that are not civil or private. In this country, an increasing share of farmland is owned and managed under other property systems and by other actors than private/family farmers.

Table 2. Land Property System in selected MENA Countries based on agricultural census data

Countries	Census Year	Civil persons		Others *(1)*	
		Share in number of holdings	Share in area of holdings	Share in number of holdings	Share in area of holdings
		(%)	*(%)*	*(%)*	*(%)*
Egypt	1999-2000	99.9	94.2	0.1	5.8

7 The same process occurred in Iraq with the 1958 agrarian reform whose aim was to destroy the influence of "imperialist big land owners" (Ishow, 1987, p. 114).

Egypt	2009-2010	99.9	93.3	0.1	6.7
Morocco	1996	…	75.8	…	24.2
Tunisia	2004	99.9	93.2	0.1	6.8
Iran, Islamic Republic of	2003	99.1	…	0.9	…
Qatar	2000-2001	99.1	…	0.9	…
Saudi Arabia	1999	99.6	91.3	0.4	8.7
Yemen	2002	…	87.8	…	12.2

(1) Others include juridical persons like corporation, cooperatives, government as well as partnership (formal or informal) of individuals or households.

(2) Source: FAO Agricultural censuses. Agricultural censuses in Egypt from 1990, 1999/2000 and 2009/2010. See references with the list of censuses.

3.2. On the structure and main characteristics of land property

Our institutionalist approach is highly dependent on the definition we adopt of possession which is related to the use of FAO data, the main source of information in the region. Following the FAO, we use the terms agricultural holding and farm interchangeably. That choice involves that land property refers to agricultural holdings, which means farms ownership. Indeed, according to the FAO (2005), the agricultural holder is the person who makes strategic decisions regarding the use of the farm resources and who bears all risks associated with the farm. Agricultural holdings and agricultural area reported by the censuses generally include crop and livestock production. Communal lands are generally not included in the agricultural census. The exclusion of forests and communal lands means that the farm sizes are smaller than they would be were forests and communal lands included especially in countries where these forms of ownership are present.

FAO (2014) showed that family farms (not small farms) produce more than 80 percent of food in the world, a number confirmed in Lowder et al. (2016). Graeub et al. (2016) estimate that 53 percent of the world's food is produced by family farms[9]. In the Middle East and North Africa, small farming is also crucial, both from the point of view of ownership and labor. According to the most recent observations made accessible by the Statistical and Economic Department of FAO, there are at least 18 million holdings in Arab countries that represents 3 per cent of the total number of holdings worldwide (Lowder et al., 2020). Figure 1 puts together data for the most recent censuses in selected countries. Time data available at country level (Jordan, Iran and Egypt). will be examined in the next section. We here consider farmland distribution and farm size over time, based on the census data, to shed lights on possible transformations of agriculture and food systems at regional and national level.

Considering the average land size as a proxy for structural change in the farming systems, and using data on average farm size for 11 Middle Eastern and Northern African countries from 1960 to 2010, we observe a sharp decrease in the average farm size from almost 8 hectares per holding to around 3.5 hectares. This trend is not straight over the considered period: a sharp decrease is recorded in the 1980s, then a slight decrease in the following period until the 2010s where a slight increase is then recorded, which may reveal a consolidation process[10] (FAO 2017). We analyze in details the trends in this indicator over time give and give the slope of this change. Table 3 presents these values at country level for most of the countries belonging to the region. There are only three countries for which we record a positive slope in the average farm size: Algeria and Turkey with very tiny positive changes and Saudi Arabia with a significant positive value. This indicator remains stable over time in Turkey, which may confirm a consolidation process. Saudi Arabia that passed through several reforms and policies in the agricultural sectors during the period also shows

9 Family farms are here defined on a country-specific basis so that country-specific size limitations are considered.

10 A consolidation process in agricultural economics is the process of enlargement of land holdings due to acquisition of other's land or other merging processes. It generally refers, as in our case, to the increasing number of middle-sized holdings which is generally reflected in a larger share of land that is owned by these class size farmers.

a consolidation as reflected in this indicator. On the other hand, countries like Egypt and Iran, as well as Lebanon and Yemen, report a declining trend in the value of average land. It seems that these countries show different trends along the distribution with an increasing fragmentation in the dimensions considered and, on the other hand, an increasing role of middle size farms and large farms is also recorded. A smooth reduction in the considered indicator is recorded in two middle size countries- Jordan and Morocco.

Table 3: Average farm size and number of farms 1960 – 2010

3.a. Number of farms

	1960	1970	1980	1990	2000	2010
Algeria		899,545			1,000,000	
Egypt	1,600,000		2,900,000	3,500,000	4,500,000	4,400,000
Iran Islamic Republic of	1,900,000			3,600,000	4,300,000	3,400,000
Iraq	253	591,178				
Jordan		55,548	62,162		92,258	80,152
Lebanon	127,123	142,811			194,829	169,512
Morocco	1,100,000				1,500,000	
Saudi Arabia		180,67	212,157		242,267	285,166
Syrian Arab Republic		524,133	485,691			
Tunisia	325,8				515,85	
Turkey	3,400,000		3,700,000	4,100,000	3,100,000	
Yemen			756,271		1,500,000	

3.b. Average farm size

Average farm size							Slope of best fit line for average farm size
	1960	1970	1980	1990	2000	2010	
Algeria		6.2			8.3		0.070
Egypt	1.6		1	0.9	0.8	1.7	-0.003
Iran Islamic Republic of	6			4.3	4.1	4.9	-0.029
Iraq	31.8	9.7					-2.210
Jordan		7	5.9		3.3	3.3	-0.104
Lebanon	2.4	4.3			1.9	1.4	-0.037
Morocco	9.8				5.8		-0.100
Saudi Arabia		6.7	10.1		16.7		0.334
Syrian Arab Republic		9	6.5				-0.250
Tunisia	15.4				10.5		-0.123
Turkey	5		6.2	5.8	6		0.019
Yemen			2		1.1		-0.045

Source: Agricultural Censuses. See references in Agricultural Census Reports and information consulted.

The list of agricultural censuses is given at the end of the article.

Labor force analysis is also a key aspect to be considered in order to analyze the structure of agricultural sectors. Table 4 provides a global picture. An accurate analysis is difficult because of the lack of data on the region, especially recent ones so that the following features should be interpreted cautiously. The first characteristics is relative to the employment structure in farms in MENA countries that relies mostly on family members. The average number of household members employed in the farm is lower than in other developing regions, even if they are higher in Algeria and Yemen where the presence of household members in the farm is higher than 2 per holding. The second structural characteristics is the relative absence of hired labor, at the exception of Qatar where the farming system is based on hired labor.

Table 4: Use of household and hired (permanent and temporary) labor in the farm

Country	Labor				
	Census Year	Average number of household members engaged in agriculture per farm (1)	Average number of hired permanent workers per farm	Average ratio of household members to hired permanent workers in agriculture	Temporary share of hired workers
Algeria	2001	3.3	0.1	30.9	..
Egypt	1999-2000	..	0.0	..	..
Jordan	1997	..	0.2	..	..
Lebanon	1998	1.0	0.1	8.2	..
Morocco	1996	..	0.1	..	..
Qatar	2000-2001	..	3.4	..	..
Tunisia	2004	0.9	0.1	9.3	..
Yemen	2002	2.3	0.2	10.6	..

Source: Authors' compilation using FAO, 2013a and numerous agricultural census reports from the 2010 round. Notes: (1) May include full time and/ or part time work by household members. ".." indicates data not available.

4. Land distribution and property structures

Agricultural production is highly dependent on the structure and distribution of land in particular via the impact it has on productivity (OECD, 2018). Besides, structural change goes with the transformation of land structure and with a change in land distribution. The aim of this section is to provide an empirical picture of the situation in the MENA countries. The following analysis of the holding and farmland distribution in the MENA region is, again, highly constrained by the availability of data that have been collected in agricultural censuses with the support of the Food and Agriculture Organization of the United Nations[11]. We will first give a broad regional perspective and, when data will allow it, provide a more accurate one for selected countries.

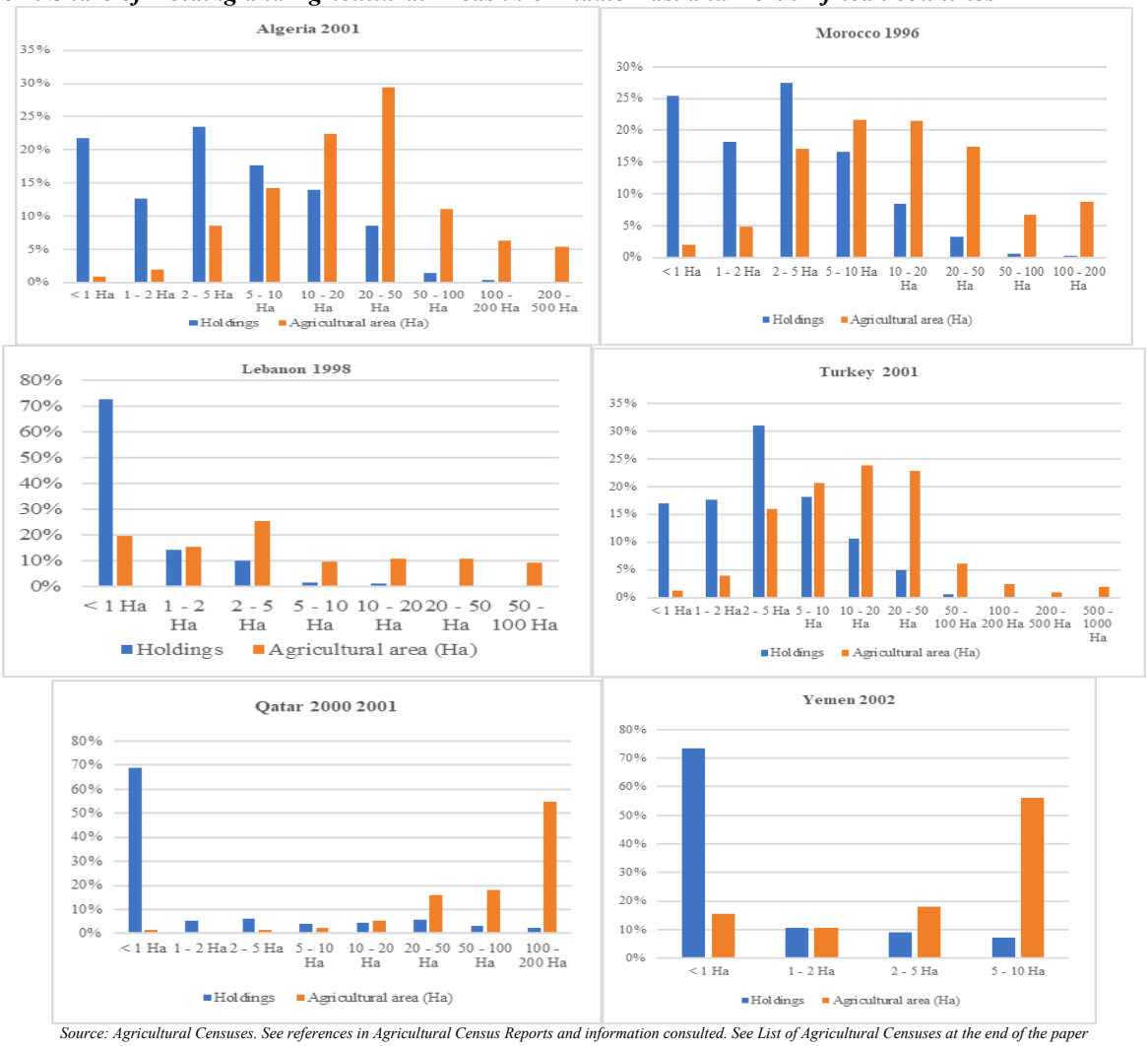
A regional perspective

In North Africa, Algeria and Morocco present similar structure in terms of farms and farmland

11 FAO has promoted the Program for the World Census of Agriculture (WCA) since 1950 by providing governments with guidance on standard methodology and contents for their agricultural census. Agricultural holdings and agricultural area reported by the census include only crop and livestock production.

distribution. Concerning holding distribution, more than half of holdings belongs to the land classes inferior to 5 hectares while medium size classes up to 50 hectares represent the remaining part. The share of farmland in the small-holder's classes- less than 5 hectares- is about 10 per cent in Algeria and 20 per cent in Morocco. In both countries, medium size farmers are important, especially in Morocco. In the Middle East, Lebanon shows a pretty equal distribution in terms of farmland among the different land classes, while it presents a clear unequal distribution of holding that are concentrated among the lowest part of the distribution. Holdings with less than 1 hectare represent more than 70 per cent and holding smaller than 5 hectares represent more than 90 per cent of total holding. The 2001 agricultural census of one of the main regional agricultural producers and exporters in the region**,** Turkey, shows that middle-size farms from 5 to 50 hectares represent more than 30 per cent of the total holdings but overall more than 70 per cent of the farmland in Turkey. Large land size classes represent a very low share of holding and around ten per cent of the farmland. In the Arabian Peninsula, Qatar and Yemen present the same opposite up-warding and down-warding trends in farmland and holding shares.

Figure 1: Share of Holding and Agricultural Areas in 6 Middle East and North African countries



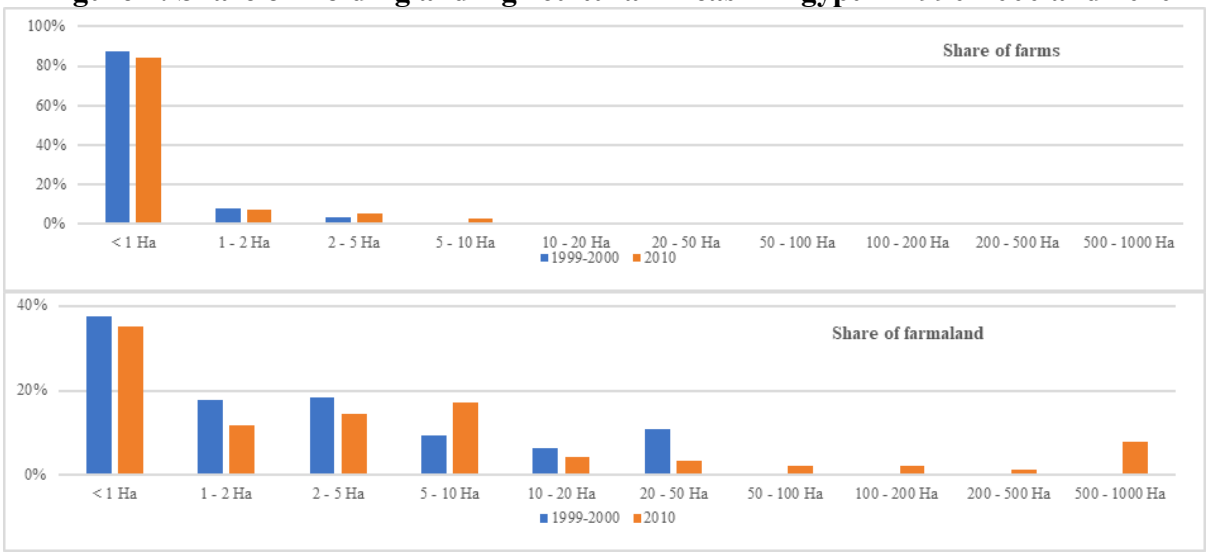
Source: Agricultural Censuses. See references in Agricultural Census Reports and information consulted. See List of Agricultural Censuses at the end of the paper

Distribution of farms and farmland area overtime by land size class for selected countries

In order to grasp changes that occurred in the structural transformation processes, time data on holding distribution and farmland are needed, which has been possible in three countries: Egypt, Iran and Jordan.

Egypt experienced an intense process of liberalization that started in mid 1990s and involved the implementation of structural transformation plans under the influence of international institutions. Egyptian agricultural census data are available for 1999-2000 and 2010. Firstly, it is worth noting the distribution structure. Farms are typically possessed by smallholders. A U-trend can be observed in the following part of the distribution with changes that happened between the periods considered. Concerning holdings distribution, data reveals a beginning of a structural change, marked by a slight decline in the share of farms in the smallest land size category- less than 2 hectares- and a slight consolidation process in land class larger than 2 hectares. The share of farmland by land size also changed more importantly in the other medium and large land size classes.

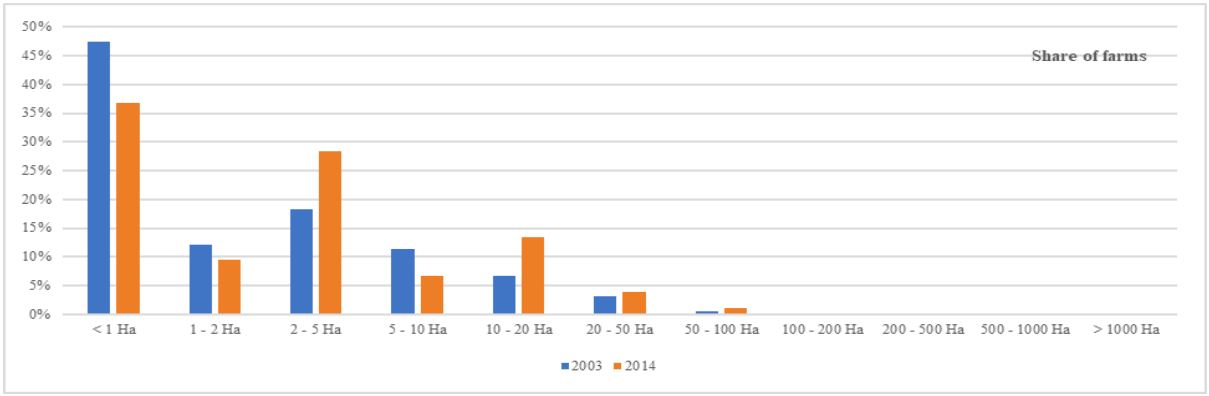
Figure 2: Share of Holding and Agricultural Areas in Egypt in 1990-2000 and 2010

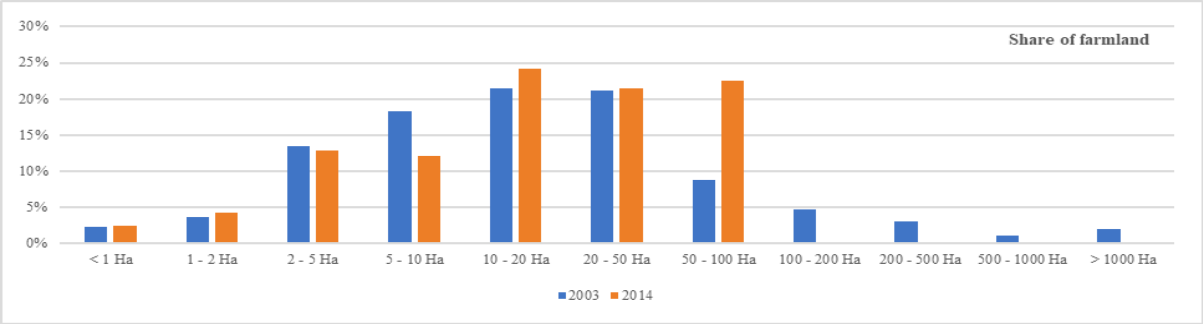


Source: Agricultural Censuses. See references in Agricultural Census Reports and information consulted. See List of Agricultural Censuses at the end of the paper

Agricultural censuses of the Islamic Republic of Iran (2003 and 2014) reveal key changes in the share of holding by land class: a sharp reduction of the share of smallholder farms (less than 2 hectares), an increasing share of holdings in the category of 5 to 10 hectares, a reduction in the 10 to 20 class and an increase in the categories that follow. In the farmland distribution, there are slight changes in the smallholders' categories with some signals of a consolidation process in the upper-middle size categories from ten hectares and more. Iranian data thus show a potential direction towards a process of slow structural transformation in the agricultural sectors.

Figure 3: Share of Holding and Agricultural Areas in the Islamic Republic of Iran in 2003 and 2014





Source: Agricultural Censuses. See references in Agricultural Census Reports and information consulted. See List of Agricultural Censuses at the end of the paper

The Jordanian agricultural system is particularly interesting to study since, despite large part of the territory is not arable, the country exports and is integrated into international markets. Data reveal that Jordan has experienced structural changes in the distribution of holdings and farmland : an increasing share of small-holder holdings but, on the other hand, an increase in the category of upper-middle from 20 to 50 and the entrance of large farms in the picture. This probably reveals the larger influence of international market-oriented farms in the scenario. Liberalization and international integration seem to have caused changes in the agricultural export oriented sector.

Figure 4: Share of Holding and Agricultural Areas in Jordan in 1997 and 2017

Source: Agricultural Censuses. See references in Agricultural Census Reports and information consulted. See List of Agricultural Censuses at the end of the paper

5. Conclusion

The MENA region has not experienced a transformation in the agricultural sector, one key condition to achieve a structural transformation of their economies toward industrialization. Why? This article does not ambition to offer a unique response since structural transformation is a complex issue that cannot be approached in a single article. We have rather chosen to offer two main explanatory paths that open the route to other research works on agriculture in the MENA region.

Firstly, we have shown that the MENA region suffers from structural constraints: scarcity of land, especially arable one, but also aridity and lack of water. Furthermore, agricultural productivity is weak in countries where a large part of the population is working in the agricultural sector without

contributing much to the GDP. Agricultural policies do not respond to these structural weaknesses, since MENA political actors are haunted by food security and political stability. They prefer commercial policies and social programs in order to avoid that the population changes hunger into uprisings. To put it in simple words: in the MENA region, *land is not friendly but is also badly exploited*.

Secondly, the article has established that the institutional land structure in MENA countries has not radically changed. It cannot be said that land property systems, including land tenures, have not evolved because of the domination of a traditional culture, inhibited by Islamic laws and customs. On the contrary, since independence, the MENA countries have adopted land tenure systems based on private property, and the collective dimension would rather come from the State which controls the rules of land possession. One main institutionalist blockage seems to come from a low evolution of landholding systems toward a consolidation process. Farming systems are still characterized by smallholders who owns small farms and do not use hire labors in their production modes. Turkey is an exception. Consolidation processes seem to come out in some countries, like Iran, Jordan and Algeria.

The article appeals for more research on agricultural issues in the MENA region. Our institutionalist analysis did not consider the social composition of the farming unit, both in terms of gender contribution and women access to farmland. More generally, our article does not enough include inequality issues so crucial in the political economy of development.[13] The relationships between agriculture, land, and the formation and persistence of political power should be addressed.[14] Furthermore, our results are very dependent on the available data. Local, regional and national surveys and case studies are absolutely needed in order to appreciate the heterogeneous distinctive features of the MENA countries.

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13 See Obeng-Odoom (2020).

14 See Baduel (1987). In this excellent special issue, Ishow (1987) points the role of the state, only motivated by political and ideological factors, in the disequilibrium of agrarian structures in Iraq and Swearingen (1987, p. 53) show how "agrarian issues in Morocco have their roots in the colonial past."

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