Ownership and Distribution of Agricultural Land in Arab countries: Land Distribution and its patterns in the region

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Abstract

A better and more complete understanding of farms distribution, changes over time and other structural characteristics of the agricultural sectors in Arab countries is urgently needed to guide policy makers' efforts towards achieving a number of Sustainable Development Goals (SDGs) and to tackle major economic and social as well as political issues in these countries rural areas. This paper takes stock of the number of farms in Middle Eastern and Northern African countries, and their distribution and that of farmland, based on what is available in the agricultural censuses. Thus, it shows that there are more than 18 million farms in the region. The stark differences between farms, in terms of size, their share in farmland distribution, and their patterns across countries in the region, make clear the importance of properly defining different types of farms and distinguishing their differences when engaging in policy discourse and decision making towards the SDGs. There is a need to improve agricultural censuses if we want to deepen our understanding of farms. Support from countries is needed so that a larger number of them supply FAO with microdata, not just tabulated results. Moreover, additional surveys or survey modules- see AGRIS in other regions- would be extremely useful. For this to happen additional funding is necessary and FAO's uniform methodology must be followed in accordance with other international, regional and national institutions.

Keywords: agriculture, land distribution, farm size, smallholder, structural transformation

1 Introduction

Land is key resource in many Developing regions and in natural resources-scarce contests such as Middle Eastern and Northern African countries. After independence and generally in the 20th century, land tenure systems in many of these countries have passed through several reforms patterns. Land related issues, natural resources management and agricultural sectors more broadly do not seem to be at the centre of the political, social and economic debate in the Arab countries also during and after the Arab springs. Nevertheless, under increasing and intense phenomena such as climate change, and related extreme weather events, and increasing food demand for growing urban population, the Arab countries are in a situation where they must find ways of feeding the growing population with a limited amount of land and water resources. This represents a clear challenge for the region together with increasing stress on scares natural resources to ensure that agricultural communities are able to contribute to ensuring that expanding urban populations have access to safe and nutritious food, recognizing the crucial role of agriculture in reducing rural poverty, malnutrition in poor countries and, at the same time, contribute to sustainable development. Another important point to be made here is that around a third of total population in Arab countries live in rural or in semi-rural areas and rely in some extent on agricultural production (FAO, 2017 and Christiansen 2017). Recently though, Arab governments committed to international treaties and general agreements- see Multilateral Environmental Agreements- to achieve national and international goals towards and sustainable and resilient future such as Sustainable Development Goals as well as the Paris Agreement on Climate Change.

The main aim of this paper is to analyse the agricultural land distribution in selected Arab countries for what concerns the ownership of this agricultural land in terms of share of holdings and share of farmland by land size. Another relevant research question related to the main one is relative to how and if there was a change during the last three decades to these dimensions as well as to others such as average land size and land-owner's characteristics.

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This paper relies on data from numerous agricultural censuses relative to all the countries where they are available. The Food and Agriculture Organization of the United Nations (FAO) has promoted the Programme 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 crop and livestock production only; holdings engaged in forestry or fisheries are only included if they are also engaged in crop and livestock production. Communal lands are generally not included in the agricultural census.

It is important here to report the definition developed by FAO in the methodological framework elaborated and implemented by its statistical division, the UN organization defines an agricultural holding as:

"an economic unit of agricultural production under single management comprising all livestock kept and all land used wholly or partly for agricultural production purposes, without regard to title, legal form, or size. Single management may be exercised by an individual or household, jointly by two or more individuals or households, by a clan or tribe, or by a juridical person such as a corporation, cooperative or government agency'' (FAO, 2005).

According to the definition provided by FAO, the agricultural holder is the person who makes strategic decisions regarding use of the farm resources and who bears all risks associated with the farm. The agricultural holder may undertake all management responsibilities or delegate day-to-day work management responsibilities to a hired manager. The difference between the hired manager and the agricultural holder (the manager of the holding) is that the former is a hired employee who implements the decisions of the agricultural holder while the latter makes all strategic decisions, takes all economic risks and has control over all production resulting from the agricultural holding (FAO, 2005). As with any source of information there are limitations to data harvested from agricultural census reports. For instance, FAO recommends that the census consider farms of all types throughout a country and that it be conducted by using complete enumeration and/or sampling methods. Despite this recommendation, some agricultural censuses survey household farms rather than all farms. This is true, for instance, in the 2010 round for many African countries but also others such as Bahrein (Lowder, Skoet and Raney, 2016).

Looking at the first results that have been made accessible to the author by the Statistical and Economic Department of FAO and as reported in the figure below, agricultural land distribution in terms of share of holdings and share of agricultural areas by land class size. According to the most recent observations, there are at least 18 million holdings in Arab countries that represents 3 per cent of the total number of holdings worldwide (Lowder, Sanchez, Bertini, 2019, forthcoming). Figure 1 puts together data for the most recent censuses, but data are available at country level in some cases for more points in time- Jordan, the Islamic Republic of Iran and the Arab Republic of Egypt. This will allow us to observe the different characteristics for these and other countries and to observe some other characteristics that are crucial to analyse the possible future patterns relatively to these dimensions as well as the possible policy implications. It is particularly important here to consider the structural transformation process- happening or not and at different speediness- in the entire economic and social systems.

The paper discusses other characteristics related to the farm characteristics in these countries where regardless of the implemented reforms in this sector have historical paths to be considered such as the persistency of traditional tenure systems. These are key elements for the future of agricultural production in Arab countries and, at the same time, of inequality in rural areas and consequently in their entire social, political and economic systems. On another hand, it is important to observe that land tenure systems originally regulated the use of arable land, pastureland and access to water-necessities basic to community survival. Agricultural land provided the main source of sustenance for the community and the permanent tax base for the government. Moreover, tradition and religious prescriptions are valid in this field. It is furthermore important to observe that agricultural land and its

resources must be put to good effect especially in the contest of natural resources scarce regions and countries such as in most of these countries. In order to meet the requirements of the new era and plan policies accordingly, every state has developed and implemented a series of emerging policies according to its national specificities and to the international regulations and trends- see national policies and regional and international conventions. For these reasons, other characteristics relative to the holdings at country level will be analysed. Average land size represents another possible variable to be considered. Despite the criticisms around this measure, this gives possible trends and source for political and scientific debate especially within an historical perspective. This therefore is also analysed to capture the potential for changes in this sector and policy framework in the considered countries. Nevertheless, other characteristics of the holdings are considered such as the land holder's characteristics in terms of family farm labour the importance of smallholders in the agricultural and farming systems the region. Therefore, specific focuses refer as well to the main characteristics of small-holder farmers that generally represents at least seventy per cent of the total number of farmers in the considered country but that cultivate less than twenty percent of the cultivated area.

Before analysing the main characteristics of the agricultural sectors in the region and the land distribution, it important to observe more general characteristics relative to the most fragile and less resilient group of farmers. Smallholders farms at all scales are critical actors in achieving the Sustainable Development Goals (SDGs). In low- and middle-income countries, poverty- either relative either among small farmers is widespread or in many countries, it is much higher than the national poverty headcount rate (Rapsomanikis, 2015). Hence, getting small-family farms out of poverty and ensuring their access to basic services, ownership and control over land and other forms of property, can be key to achieving the goals of ending poverty (SDG 1), hunger (SDG 2), and inequality (SDG 10). Ensuring conditions for family farms more generally and small-holder farmers in particular, so they can achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors, will also be critical not only for the aforementioned SDGs but also, inter alia, to achieve economic growth (SDG 8) and more sustainable production patterns (SDG 12).

The United Nations General Assembly recognized the importance of family farms by designating 2019–2028 as the UN Decade of Family Farming and entrusted the Food and Agriculture Organization of the United Nations (FAO) and the International Fund for Agricultural Development (IFAD) with the implementation of the decade. This paper takes support from the publication of Lowder, Sanchez, Bertini paper that was developed in preparation for the global launch of the decade on 27–29 May 2019, at the FAO headquarters in Rome, Italy, specifically to update estimates of, and inform on the number of family farms in the world. In addition to taking stock on the number of family farms worldwide as well as the distribution of farms and farmland throughout the world, which is itself and important contribution, the paper unveils the stark difference between family farms and small-farms and provides policy implications and recommendations.

The paper is structured as follow: Section 1 presents an overview of the importance of land related dimensions in the Middle Eastern and Northern African region. Section 2 shows the outcomes from WCA/FAO for selected Arab countries in order to capture the dimensions of the processes going on for this respect with a specific focus on farmland distributions in terms of share of holdings and agricultural areas land size classes. General pictures relative to the region will be presented and, at the same time, country level analyses are provided with a special focus on countries where we have data on more than one point in time such as Egypt, Jordan, and Iran. Analysis of average land size trends from the 1960s to 2010s is provided at regional and country level where data are available in order to have a broader historical perspective of this dimension of agricultural land concentration and to observe the eventual process of consolidation – or fragmentation- has happened or not in the region. This core Section presents also the main features for other dimensions at country level. Finally, the paper presents the main conclusions relative to the foreseeable trends in agricultural and national political economics

trends for the Arab region and for some countries specifically. Lastly the paper will introduce some of main challenges these countries' policy makers will have to face in the contest of changing climate conditions, increasing urban population, natural resources management constantly under stress and food security.

2. The Importance of Agriculture in Middle Eastern and Northern African countries: Agriculture in MENA Economies

Agriculture is an important aspect of economy of MENA region. This is particularly true even though the region suffers from 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. Large scale irrigation along with modernisation has supported extensive production of cash crops which includes fruits, vegetables, cereals, and sugar in the Middle East. The water scarcity on the other hand, along with high evaporation rate is responsible for such low percentage of agriculture in the nations in Arabian Peninsula. However, Agriculture is still of special interest to these countries as the whole Arabian Peninsula is majorly dependent on the imports for meeting it food demands.

As of 2015, Agricultural sector in the MENA region is expected to grow for the next five years(Woertz, Eckart, 2017). Agriculture sector is mainly driven by higher health consciousness, innovations in science and technology, rising disposable income and rising population. Lack of farming land, scarcity of water and unfavourable climatic conditions are acting as the barriers for cultivation. Keeping in mind the growth in food consumption, the governments in these nations are taking all the measures to improve local production as well as access to international markets. New technology and latest methods of farming are being implemented to grow crops. Another interesting aspect given the high dependency in food availability in the region is the signing of Greater Arab Free trade Agreement (GAFTA) which aims to reduce tariffs and trade barriers, is likely to increase the intra MENA trade. It is evident from the fact that trade among MENA countries have risen sharply in the last few years (Woertz, Eckart, 2017).

On the other hand, agriculture is the regional largest water consumer and still provides a substantial proportion of employment in some of the region's countries. In most countries nevertheless agriculture's value added as percentage of GDP is in less than 10 per cent. In Oil producing countries as Libya and the Gulf countries it is at 2 per cent or below. In some countries, such as Egypt, Iran, Syria and Morocco, the rural population is a relatively large proportion of the total, but even in these countries agriculture's contribution to employment and value added is limited (Woertz, Eckart, 2017). In Sudan and Yemen, where most of the population still live in rural areas, agriculture's contribution to employment and value added also trails behind (FAO, State of Food and Agriculture 2017). This points to low productivity and hidden unemployment in the countryside. In a substantially urbanised country like Turkey, for example, 30 per cent of the labour force still work in agriculture but contribute for only around 9 per cent of the value added. Focusing on the natural resource's exploitation, the largest water user in the region is Agriculture, withdrawing roughly 80 per cent (AQUASTAT, 2019, Allan et al., 2015; Allan, 2011; Allan, 2001; Dawoud, 2007). Past agricultural expansion has been ecologically and economically questionable because of its reliance on limited water resources and costly producer subsidies- see Saudi Arabian case. On the other hand, other countries in the past did not neglect agriculture in the wake of the oil boom. With the help of land reform and agricultural subsidies it cultivated a political support base in the countryside (Hinnebusch, 2011). The system was geared towards large-scale flood irrigation for water-intensive crops like cotton and wheat. Consequences of climate change in the region- see droughts- and reforms have been considered as possible exacerbation of conflict in some regions of these countries. In some cases, a greater focus on more value-added crops

like fruit and vegetables is indicated; this will require different technologies, infrastructure and distribution networks. Reliance on food imports is here to stay and will likely increase with population growth and more varied diets. This raises crucial questions and issues about the reliability of global markets in supplying such food imports. Agriculture in the region is undergoing a process of reorientation against the backdrop of past development policies, lasting socio-economic importance, and natural constraints.

From an historical point of view evolution of land, food, and agricultural policies, it is important to observe that farmers made up most of the Arab population until not too long ago. Nevertheless, farmers are a heterogeneous population ranging from small-holders through mid-sized farmers to large farmers. Their participation in the political arena unrest has often articulated itself in the form of ethnic-cum-peasant protests rather than as class-based conflict (Woertz, Eckart, 2017). Yet the agricultural question has remained large in these countries' history and there is no escaping that it still plays a role today. Historically and before reforms implementation some important Arab countries- as Egypt and Iraq- had among the most unequal distributions of land ownership in the first half of the twentieth century. This was the result of the region's integration into a semi-colonial export trade of agricultural commodities, including cotton, sugar, opium and silk. In the course of time, the land tenure system witnessed a transformation from Ottoman tax farming to the establishment of private land ownership and a cadastre system (Issawi, 1995; Owen, 1993). Absentee landlords and colonialism not only embodied inequality of land ownership, they were also an impediment to the industrialisation that could have provided alternative avenues for economic development in the absence of land reform. This situation changed after WWII with land reform in the Arab world especially in Egypt, Syria and Iraq (Waterbury, 1983; Hinnebusch, 1989; Batatu, 1978). It was mostly a medium quartiles segment among the farmers that benefited from such reforms, being able to increase its holdings and market access. The landless and poor peasants saw only limited gains, while the power of large landlords was reduced if not dismantled. Interesting it is also to observe how different political interests influenced the different agricultural sectors. For instance, in Egypt, the markets for fruit and vegetables remained free of government interference and this encouraged a shift of acreage into horticulture and fodder production. In the 1980s the Egyptian state began to dismantle state-intervention policies and liberalisation policies were pushed further in the 1990s. By 1995 only cotton and sugar cane remained under government regulation in Egypt. On another extent, Turkey used to have a far-reaching programme of agricultural producer subsidies that entailed price supports, input subsidies and marketing monopolies. These have been pushed back with policies that have favoured privatisation and the removal of trade barriers. Turkey is the seventh largest agricultural economy in the world. It is a significant agricultural exporter and it has considerable self-sufficiency in cereals. It is the world's largest producer of many agricultural commodities. Similarly, Morocco, Tunisia and Egypt are significant exporters of fruit and vegetables—to the European Union—while importing most of their staple foods (López et al., 2013).

In recent years- before the so-called Arab Awake- reform measures have deeply affected rural populations (Hinnebusch, 2012). For instance, The Syrian uprising of 2011 has been blamed on climate change in crude Malthusian terms; yet, for a fuller understanding, one needs to consider that—prior to the drought—increasing social polarisation took place, and that the regime's reaction to it was inadequate (de Chatel, 2014; Woertz, 2014). Structural adjustment policies also affected agriculture in Egypt and contributed to increased inequality and it mostly pushed back the land reforms of the Nasser era (Bush, 2002; Bush, 2014). The process of rolling back land reform was fraught with influence trading. Wali was stripped of his official positions following corruption charges in 2004—a remarkable feat in a regime that was not known for its excellence in governance. This historical overview show how MENA food security has been affected by social inequalities, rural neglect, structural conditions in the land and agricultural sectors and exposure to volatile global markets for food imports (Woertz, Eckart, 2017).

3 Data sources and definitions for Holding and Farmland Distribution

This section reports the main definitions and sources used in the following part of the paper. This analysis relies on data from agricultural censuses to update the number of farms in the world and explore patterns around farms size and farmland distribution. FAO has promoted the Programme for the World Census of Agriculture (WCA) since 1950, by providing governments with guidance on standard methodology and contents for their agricultural census. In order to update the number of farms in the world and explore patterns, we used information from agricultural census reports from 6 different WCA rounds dating back to 1960 and up to the most recent, 2010 round. Rather than analysing raw agricultural census data, which are generally stored at the country level, we rely on the tabulated data as provided to FAO via agricultural census reports. We recorded the most recent estimate of the number of farms, farmland distribution, and information on labour and age for each country or territory for which an agricultural census has been carried out and for which a report was available Agricultural holdings and agricultural area reported by the censuses generally include crop and livestock production only; holdings engaged in forestry or fisheries are only included if they are also engaged in 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.

As stated in the Introduction, we use FAO's definition of an agricultural holding or farms, namely: "an economic unit of agricultural production under single management comprising all livestock kept and all land used fully or partly for agricultural production purposes, without regard to title, legal form, or size. Single management may be exercised by an individual or household, jointly by two or more individuals or households, by a clan or tribe, or by a juridical person such as a corporation, cooperative or government agency" (FAO, 2005). We use the terms agricultural holding and farm interchangeably here. The agricultural holder or farmer is the person who makes strategic decisions regarding the use of the farm resources and who bears all risks associated with the farm. The agricultural holder may undertake all management responsibilities or delegate day-to-day work management responsibilities to a hired manager. The difference between the hired manager and the agricultural holder (the manager of the holding) is that the former is a hired employee who implements the decisions of the agricultural holder, whereas the latter makes all strategic decisions, takes all economic risks and has control over all production resulting from the agricultural holding or farm (FAO, 2005). As with any source of information, agricultural census reports and the censuses themselves present limitations. By relying on agricultural census reports rather than raw agricultural census data, we are limited to considering only the information that is presented in the report and we may only consider it as it has been tabulated by the authors of the report. Furthermore, the censuses themselves present limitations. For instance, FAO recommends that censuses should consider farms of all types throughout a country and be conducted by using complete enumeration and/or sampling methods. Despite this recommendation, some agricultural censuses survey farms that are associated with a household (household farms) rather than all farms, thus excluding corporate entities and government holdings. This is true, for instance, in the 2010 round for many African countries but also in some Arab countries as Bahrein (Lowder, Skoet and Raney, 2016). To the extent that this is the case, our estimates of average farm size are biased downward.

4 Basic Characteristics and Distribution of farms and farmland area by land size class

There are more than 18 million farms/holding in the all Arab regions according to the most recent and available data. Estimates of farms by farm size class are useful because they give us an idea of the average size of farms operated by most farmers, while the share of agricultural land by farm size class gives us an idea of the size of farms upon which the majority of farmland is found. Estimates of the number of farms by farm size class are widespread- where not updated- see Iraq, since many countries provide that information in their agricultural census. It is more difficult to estimate how farmland is

distributed among farms of different sizes, since fewer countries report information on agricultural area by land size class and less information are provided in the agricultural censuses themselves.

Table 1 **Number of farms, by country, most recent census**

Country	Census year	Total number of farms	Income group
Region total		18,010,142	
Algeria	2001	1 023 799	Upper-middle-income
Bahrain	1980	806	High-income
Egypt	2009-2010	5 404 395	Lower-middle-income
Iran (Islamic Republic of)	2014	3 359 409	Upper-middle-income
Iraq	1970	591 178	Lower-middle-income
Jordan	2017	107 707	Upper-middle-income
Kuwait	—	0	High-income
Lebanon	2010	169 512	Upper-middle-income
Libya	1987	175 528	Upper-middle-income
Morocco	1996	1 496 349	Lower-middle-income
Palestine	2010	111 310	Lower-middle-income
Qatar	2000–2001	3 553	High-income
Saudi Arabia	2015	285 166	High-income
Sudan	—	0	Lower-middle-income
Syrian Arab Republic	1980	485 691	Lower-middle-income
Tunisia	2004	515 850	Upper-middle-income
Turkey	2001	3 076 649	Upper-middle-income
United Arab Emirates	—	—	High-income
Yemen	2002	1 488 406	Lower-middle-income

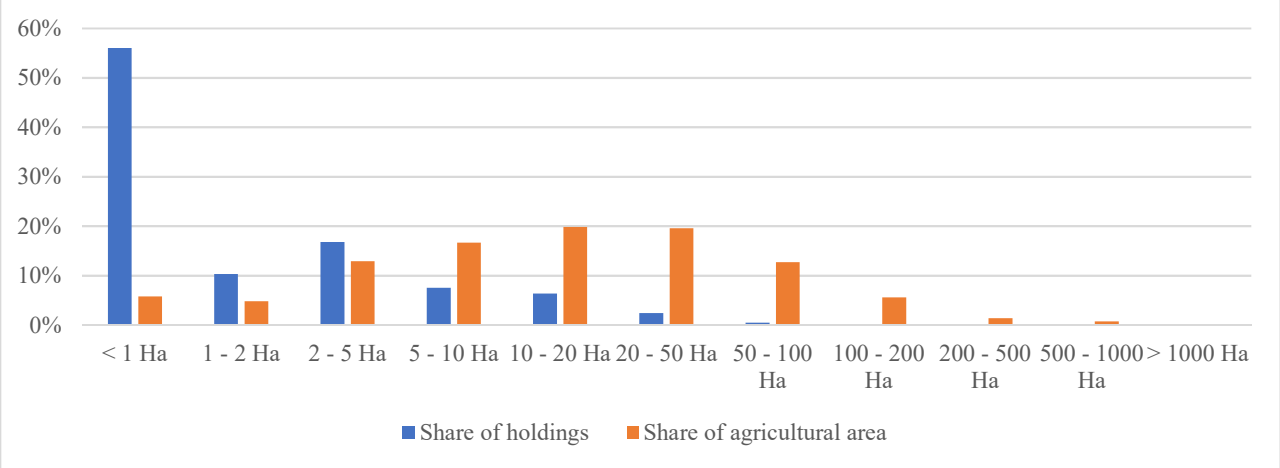
Source: Agricultural Censuses. See references in Agricultural Census Reports and information consulted. See List of Agricultural Censuses at the end of the paper

Here we present the most comprehensive estimate possible of the distribution of farms and farmland by land size class. We have data on the number of farms by land size class for 9 countries according to the information provided by the agricultural census report. For all these, we also have information on total agricultural area and agricultural area by land size class. For the countries with missing information, FAOSTAT estimates of arable land and permanent crops were used to fill the gap on agricultural area. For those countries, we estimated agricultural area by land size class cohort by computing the product of the midpoint of that land size class cohort (i.e., 0.5 hectare for the 0 to 1 hectare cohort) and the number of farms in that cohort – ensuring that the resulting total agricultural area did not exceed total agricultural area in the country.

The results relative to the global picture (Lowder, Sanchez, Bertini, 2019) show that, worldwide, farms of less than 1 hectare account for 70 percent of all farms, but operate only 7 percent of all agricultural land while the regional picture relative to the Middle Eastern and Northern African region, more than 55 per cent of the holdings are less than 1 hectare but operate only 5 per cent of the agricultural land. At global level, slightly larger farms between 1- and 2-hectares account for 14 percent of all farms and control 4 percent of the land. Together, farms of less than 2 hectares account for 84 percent of all farms

but operate only around 12 percent of all agricultural land. Farms in the range of 2 to 5 hectares account for 10 percent of all farms and control 6 percent of the land. Interestingly, the largest 1 percent of farms in the world (those larger than 50 hectares) operate more than 70 percent of the world's farmland (Lowder, Sanchez, Bertini, 2019). At regional level in the MENA region we observe- see Figure 1- slightly larger farms between 1- and 2-hectares account for 12 percent of all farms and control 4 percent of the land. Together, farms of less than 2 hectares account for 65 percent of all farms but operate only less than 10 percent of all agricultural land. Farms in the range of 2 to 5 hectares account for 17 percent of all farms and control 12 percent of the land. On the hand, the largest 5 percent of farms in the region (those larger than 50 hectares) operate more than 25 percent of the regional farmland.

Figure 1: Share of Holding and Agricultural Areas in 9 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

Focusing on Figure, it is important in our opinion to analyse the bottom, medium and upper part of the presented distribution in order to give the opportunity to policy makers and practitioners to analyse the land distribution issue from a political economy point of view. Farms smaller than 1 hectare, though representing the larger number of farmers, operate a very small share of the total agricultural area and they clearly represent the level of fragmentation of land distribution characteristic that belongs to many developing regions- as shown with the comparison with the Global data. Moreover, it is interesting to observe how farms smaller than 5 hectares represents more than 80 per cent of all the farm-holders but operates only a fifth of the total agricultural land. In the central part of the distribution, we separate here farms between small-medium holders- from 5 to 20 hectares- and upper-medium- from 20 to 50 hectares. The first group represents the larger group in terms of share of land but represent only 12 per cent of the total number of farmers. This is particularly interesting from a political economy analysis at least in rural areas in many of these countries where the role middle-size farmers is higher in some cases of that of large land owners. For what concerns the group of upper-middle farmers they cover a considerable 20 per cent share of the total area being less than 5 five percent of the number of holders. Again, here it is important to stress the role middle-sized farms in the agricultural scenario in the region. For what concerns the large holding category- more than 50 hectares of farm- as stated above they operate more than 25 percent of the regional farmland being less than 5 per cent of the number of farms. This regional picture gives us the opportunity to emphasize the role of small-holders farmers with the emphasis in the level of fragmentation at the bottom of the distribution and at the same that of medium-size farms that representing the larger part of the farm land benefited from the historical changes in the mutated conditions and reforms during the sixties and the seventies and suffered from the liberalization path started in the nineties. At the same time though, they represent the core of the agricultural and farming system in many countries in the region therefore they are a key economic, social and political actor in the national arena. Further analysis from a different indicator and focus perspective on land

distribution will be provided with the analysis of average land size over time in the next section. This analysis will give an historical perspective on the land distribution pattern in the region during the last decades.

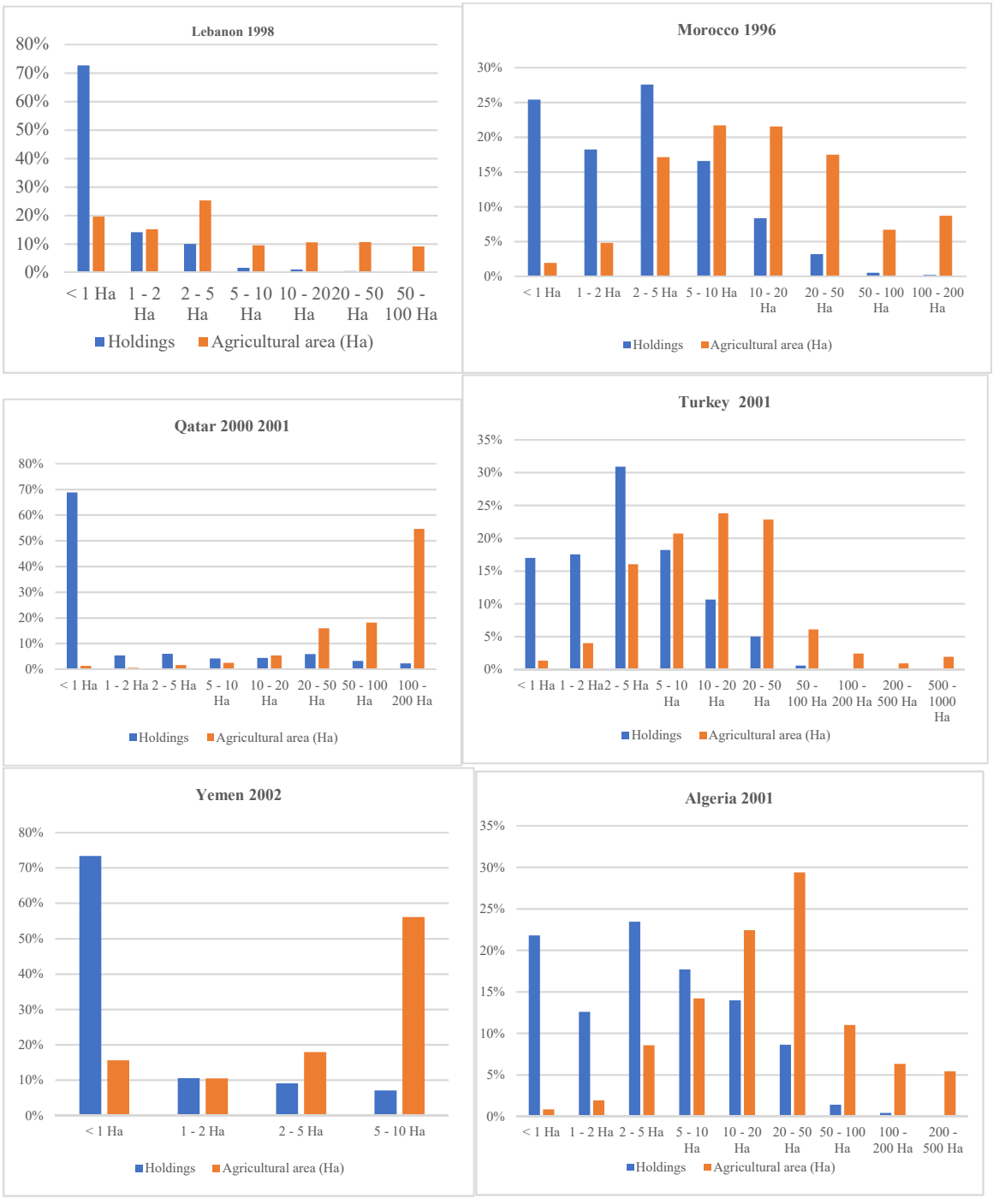
In the following sections we will repeat the same analysis on farmland distribution by land size for the countries for which we have on -for the most recent agricultural census and for two points in times for three countries for which data are available.

4.1 Distribution of farms and farmland area by land size class for Selected countries

According to what reported in Lower, Skoet, Raney 2016, the share of farmland operated by larger farms is larger and that of smaller farms smaller where average incomes are higher suggests that farmland becomes more concentrated among larger farms as economies develop. Unfortunately, data relative to distribution of farms and farmland areas at country level are not available for all the countries and for not recent here. Despite this, it is important to present the main results relative to this dimension in order also to characterize policies and interventions in agricultural sectors and especially in land tenure systems. Accordingly, it important to observe how land distribution in middle eastern and norther African countries vary among income groupings and territorial characteristics. Northern African countries- Algeria and Morocco- presents similar structures from the point of view of the structure of their farms and farmland distribution. For what concerns farm distribution, more than half of holdings belongs to the land classes lower than 5 hectares while medium size classes up to 50 hectares represent the remaining thirty thirty-five per cent of the number of holdings. The farms larger than 50 hectares are though less than 5 five per cent both countries. From the point of view of farmland distribution, it is key, on the contrary, to observe that as that the share of farmland in the smallholder's classes- less than 5 hectares- is about 10 per cent in Algeria and 20 per cent in Morocco. A more concentrated structure in terms of larger share of farmland belonging to the larger farms is reported in Algeria while a different figure with a larger share of farmland belonging to upper-medium size farm characterizes Morocco. All in all, both cases show an important role of medium size farmers and a more distributed pattern compared to the regional picture as reported in Figure 1. Lebanon shows a pretty equal distribution in terms of farmland among the different land classes while it presents a clear inequal distribution of holding that are concentrated among the lowest part of the distribution with holdings less than 1 hectare being more than 70 per cent and smaller than 5 hectares more than 90 per cent. The agricultural census of Turkey for 2001 reports an interesting pattern that is interesting to observe being Turkey one of the main regional agricultural producers and exporters in the region. Farms smaller than 1 hectare are more than 20 per cent and they have only 1 per cent of the total farmland in the country. The same feature is replicable for land class smaller than 2 hectares while classes relatively larger within land class smaller than 5 hectares covers more than 30 per cent of holdings and about 15 per cent of the total farmland. Very interesting are the features relative to the middle-size farms from 5 to 50 hectares that represents 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. These data shows that Turkey implemented in previous years an intense process of structural transformation in rural areas and agricultural sectors that allowed, as well with other factors, to lead to a stronger and more efficient agricultural sectors and to be one of the main producers and exporters of agricultural production at regional and global level and at the same time self-sufficient in key productions as cereals. Very different Arabic Peninsula countries as Qatar and Yemen present the same opposite up-warding and down-warding trends in farmland and holding shares. Obviously the two countries are very different though from the economic, social and political point of view and the same structure of their farmland and agricultural systems. Qatar presents a span of land classes up to more than 100 hectares showing a high level of concentration of farmland in the upper side of the distribution and on the other hand a concentration in the bottom side for the share of holding. Yemen shows a span of land classes only up to 10 hectares and the same patterns of Qatar in terms of the shapes

of the two distributions considered. Structure of Yemen agricultural system in 2001 is the one typical of a low-income developing country.

Figure 2: Share of Holding and Agricultural Areas in 9 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

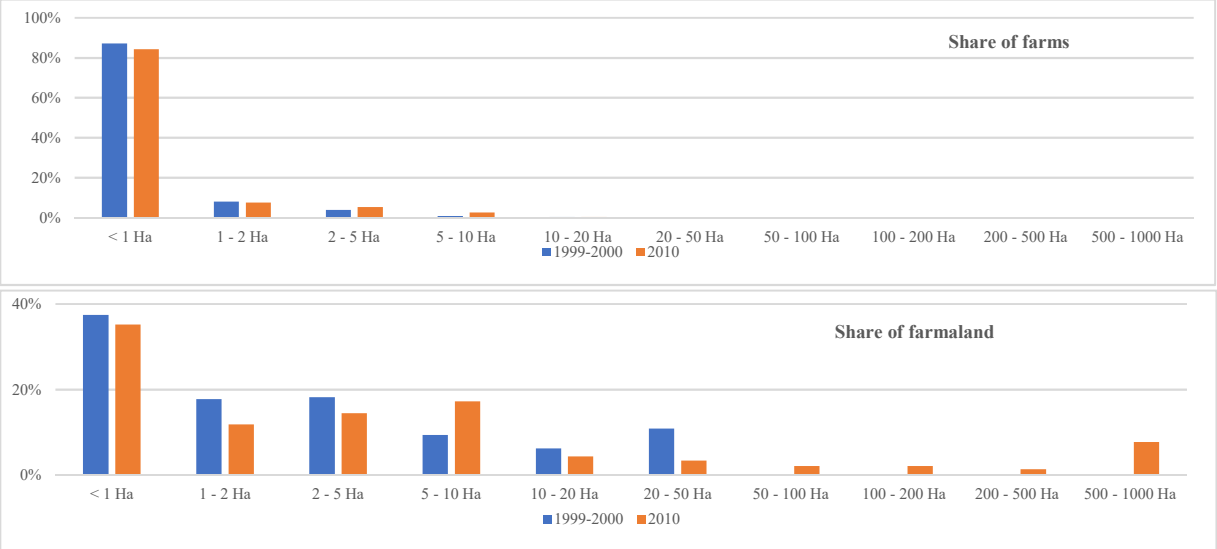
4.2 Distribution of farms and farmland area Overtime by land size class for Selected countries

This section is dedicated to the analysis of three Middle Eastern and Northern African countries that provided data in their agricultural censuses on the distribution of holdings and farmland area over time. This is in our opinion particularly important in order to study the pattern and the speediness of structural transformation process in rural areas and in agricultural sectors particularly. Being the passage from the

lower productivity to higher productivity sectors in the entire economic system the classical definition of structural transformation, changes in the key and structural characteristics of each economic sector and in our case the agricultural sectors are the centre of this process. In this section, changes happened in 10 or 20 years in the distribution of holdings and farmland in Egypt, Iran and Jordan are presented. This is a key element in the broader discussion regarding structural transformation processes in the Arab countries and another important element in political economical debate on inequality, access to resources and poverty in the entire country and in rural areas.

Egypt passed through an intense process of liberalization starting from mid 1990s and increased in the 2000s with the implementation of structural transformation plans under the influence of international financial institutions. Egyptian agricultural census data are available for 1999-2000 and 2010 allowing to analyse some of the changes that happen in the two characteristics that we analyse. First, it important to observe some structural characteristics in the analysed structure of distribution. The vast majority of farms- more than 80 per cent- are smallholders with less than 1 hectare and that more than 95 per cent of the farms are with less than 5 hectares, on the other hand, number of middle size and large farms is a residual number of the total number of holdings. On the other hand, the farmland distribution presents a structural situation of fragmentation at the bottom of the distribution with farms lower than 1 hectare with around 35 per of the total farmland and another 30 per cent in the less than 5 hectares class. An U-trend can be observed in the following part of the distribution with changes that happen between the periods considered. For what concerns the distribution of holdings, the share of farms in the smallest land size category- less than 2 hectares- slightly declined and slight consolidation process in this dimension can also be observed from land class larger than 2 hectares. The share of farmland by land size changed more importantly showing a possible beginning of a process of consolidation/transformation at least in this dimension in the considered period: reduction of the share of farmland belonging to the class size smaller than 5 hectares and the contemporary increase of this share of the class from 5 to 10 hectares, a slight decline in the categories less than 50 hectares and a increase of the classes above 50 hectares.

Figure 3: Share of Holding and Agricultural Areas in Egypt in 1990-2000 and 2010

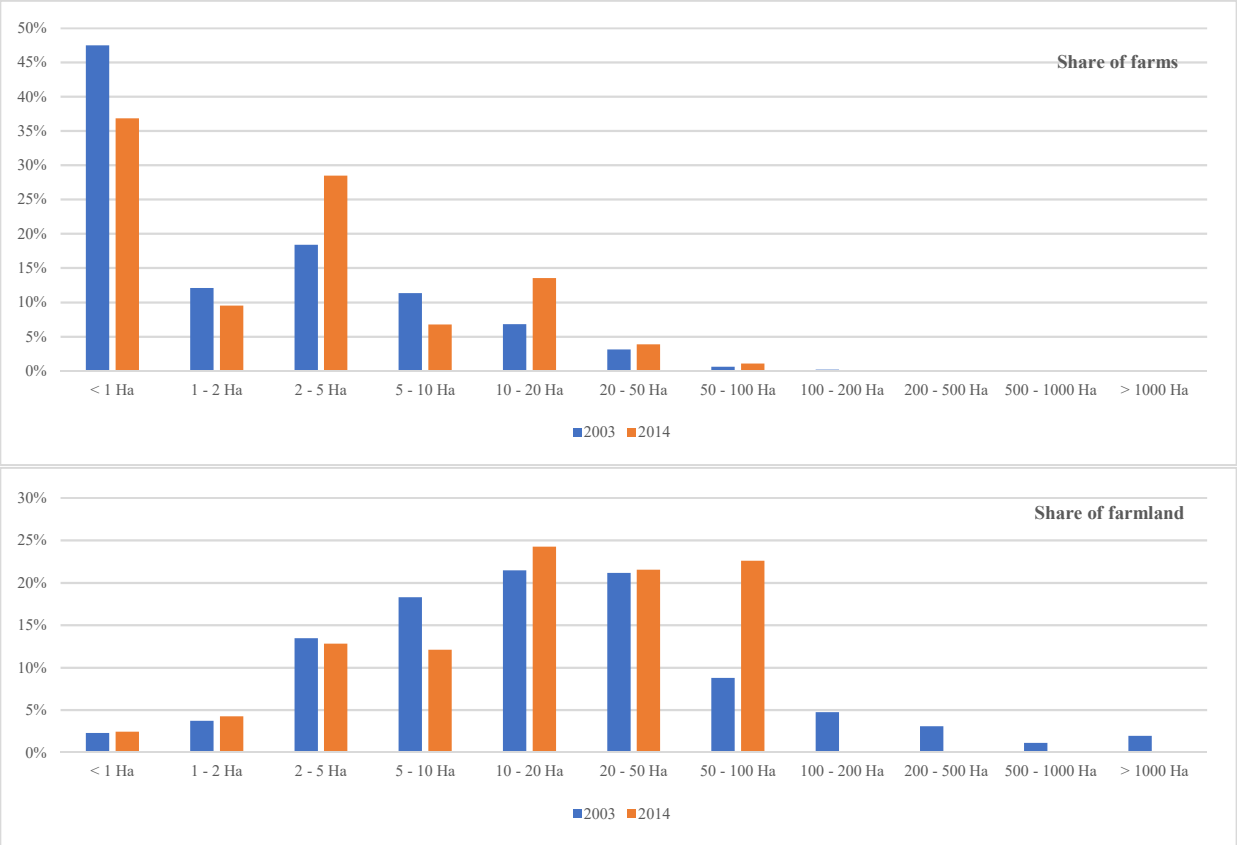


Source: Agricultural Censuses. See references in Agricultural Census Reports and information consulted. See List of Agricultural Censuses at the end of the paper

The Islamic Republic of Iran' agricultural censuses for 2003 and 2014 present information and data relative to the distribution of holdings and farmland therefore allowing to observe the changes in these dimensions. Iranian economy depends largely on oil production and the agricultural sector in Iran suffers of the same issue than many other middle eastern countries especially from the point of view of

lack of attention of national policy makers. Moreover, Iran within itself show very different characteristics, patterns and systems, nevertheless it is interesting to observe the changes in the structure of land distribution at national level. Generally, in the two periods considered, holdings and farmland distribution are concentrated in the first part of the scale with more than three quarters of the holdings being smaller than 5 hectares and with around 40 per cent with less than 1 hectare. The larger class size the smaller the share of holdings in the classes larger than 5 hectares with changes that happened in the considered and presented below. The distribution of farmland is more concentrated among the middle-class sizes with here as well changes that happened in the considered period. From 2003 to 2014, some key changes in the share of holding by land class are observable: sharp reduction of the share of smallholder farms less than 2 hectares, increase in the share of holdings in the category of 5 to 10 hectares, a reduction in the 10 to 20 class and an increase in the following categories. On the other hand, in the farmland distribution there are slight chances in the smallholders' categories with some signals in the sense of consolidation process in the upper-middle size categories from ten hectares and more. Interestingly Iranian data shows some possible direction towards a process of slow structural transformation in rural areas and in particular in the agricultural sectors such as the reduction of the share of holdings for class size lower than 2 hectares- that though is not reflected in the share of farmland operated by these farms that remains very low in total- and on the other hand, a consolidation process in the larger farm for what concerns especially the middle and upper-middle categories.

Figure 4: Share of Holding and Agricultural Areas in the Islamic Republic of Iran in 2003 and 2014

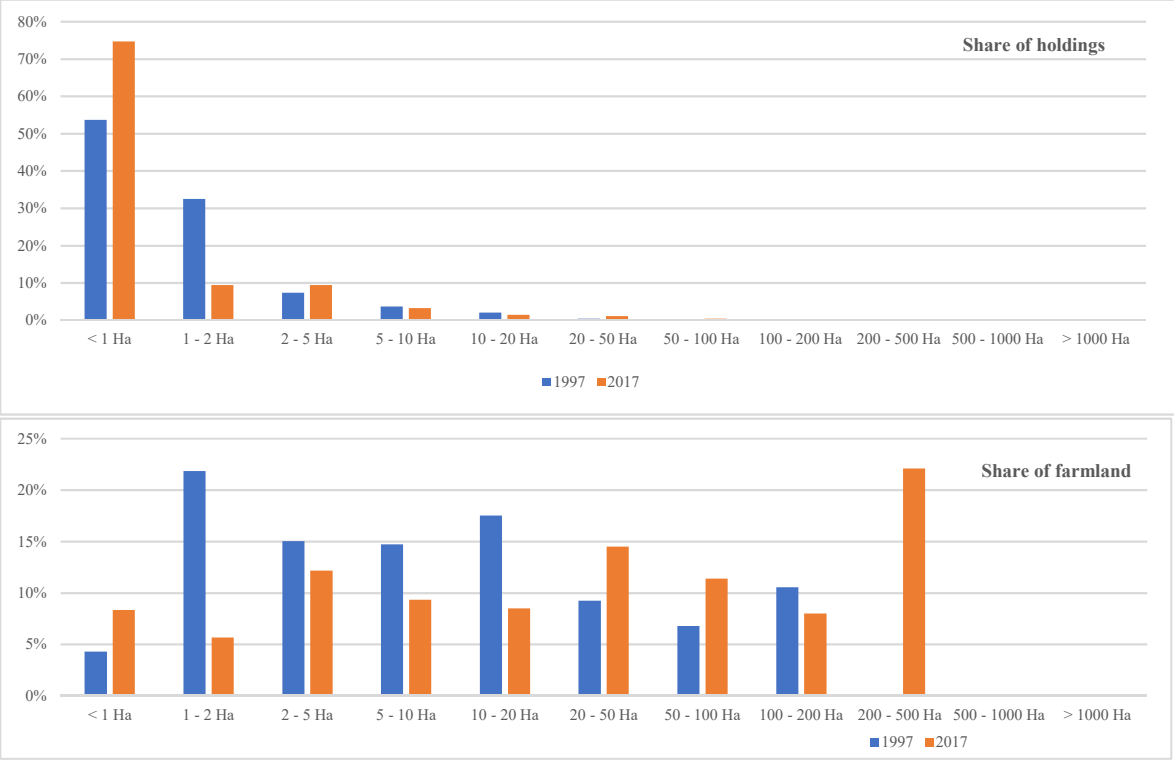


Source: Agricultural Censuses. See references in Agricultural Census Reports and information consulted. See List of Agricultural Censuses at the end of the paper

Jordanian agricultural system is particularly interesting for several reasons: from structural point of view of the territorial and climatic aspects- large part of the national territory is not arable- and for its openness to exports and its integration in the international markets. Moreover, it is interesting here to observe the changes that happened during a 20 time and therefore observe larger changes to the distribution of holdings and farmland. Jordanian distribution of holdings is as in many other countries

in the region concentrated towards the small holders categories as is reflected by the fact that land classes lower than 2 hectares are more than 80 per cent and only the land class of 2 to 5 reports values larger than 5 per cent. Interestingly too, the farmland distribution- that changed a lot in the considered time period- presents an overall equal distribution compared to other countries in the region with an important role played by middle-size land categories. The period considered is particularly interesting in terms of policy reforms and major events in the country and in the region. The trend of increasing internationalization for the national economy together with process of liberalization has caused changes in all the economic sectors and agriculture- especially that oriented towards export- is not an exception. For what concerns the holdings' distribution it is interesting to record the sharp increase in the category of less than 1 hectare and the contemporary decrease in the 1 to 2 hectares, this process of fragmentation can be due to cropping specialization towards production that requires smaller farms but more probably to the reduction in size of farms more oriented towards subsistence agriculture than to international market. Other little changes in the other categories show possible signals of consolidation but in order to observe them it is better to analyse the farmland distribution. Among land class sizes smaller than 20 hectares only the smaller than 1 increase as consequence probably of the increasing number of farms in this category. More interesting seems the situation of the upper middle-class size categories that with the only exception of the category 100 to 200 hectares show a clear process of enlargement of farms and concentration process in the agricultural sectors. Particularly interesting are two aspects: increase in the category of upper-middle from 20 to 50 and the entrance of large farms in the scenario showing probably the larger influence of international market-oriented farms in the scenario.

Figure 5: 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 Farmland distribution and farm size over time: average land size in agricultural censuses

Analysis of farmland distribution and farm size over time, based on the census data, sheds lights on possible transformations of agriculture and food systems in the world. By considering farmland distribution, we learn about the welfare of farmers as well as the makeup of our food system. In a country where a large share of GDP comes from agriculture (as opposed to industry or services), and

where a large number of very small farms are in operation, we might imagine that there is a large share of the population engaged in subsistence agriculture- see Yemen. In such an agricultural economy, an increase in the number of small farms over time may raise concerns regarding the well-being of smallholder farmers. In countries where large shares of farmland are found on large farms, we might expect to see more industrial agriculture. An increase in the share of land farmed on large farms might raise concerns that the food system is becoming increasingly industrial and export oriented where natural resources as land and water are scarce and international markets are consistently changing. Numerous factors underlie such changes and are beyond the scope of this paper. These include land tenure policy, population density and population growth, the availability of arable land and off farm employment opportunities, among others (see, for example, Tan *et al*., 2013; Jayne, Chamberlin and Headey, 2014; Sitko and Jayne, 2014; Dawe, 2015 and Van Vliet *et al.*, 2015). Looking at the literature on the topic, Lowder, Skoet and Raney (2016) review recent literature (2010–2014) on changes in average farm size over time as well as farmland distribution. They summarize the findings as average farm sizes having increased in the developed world and decreased in the developing world. Exceptions to this include findings by Jayne, Chamberlin and Headey (2014) that in some land abundant countries in Africa average farm sizes have increased in recent years, while in land constrained contexts such as some Middle Eastern and Northern African countries average farm sizes have decreased.

Through their own examination of agricultural census reports, Lowder, Skoet and Raney (2016) likewise stress the need to nuance the finding of decreasing average farm size in the developing world. Using data on average farm size for 107 countries, they show that from 1960 to 2000, average farm size decreased in most low- and lower-middle-income countries and in South Asia as a whole. Average farm sizes increased from 1960 to 2000 in some upper-middle-income countries and in nearly all high-income countries considered. As reported in the table below, for 11 Middle Eastern and Northern African countries there was 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 decreased is recorded till the 1980s when almost all the countries have completed land reforms oriented towards a more egalitarian distribution of land, and a slight decrease in the following period till the 2010s where a slight increase is even recorded showing a possible evidence of a consolidation process.

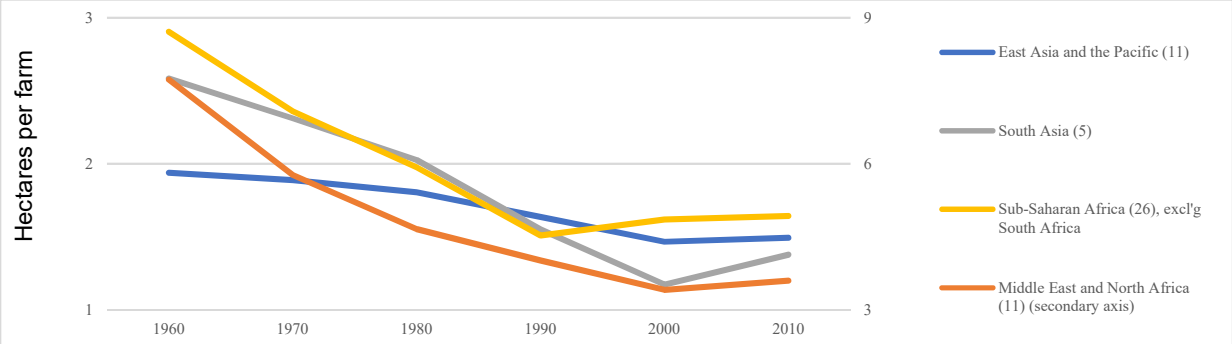
Table 2 **Average farm size by region, 1960–2010**

	1960	1970	1980	1990	2000	2010
East Asia and the Pacific (11)	1.9	1.9	1.8	1.6	1.5	1.5
Middle East and North Africa (11)	7.7	5.8	4.7	4.0	3.4	3.6
South Asia (5)	2.6	2.3	2.0	1.6	1.2	1.4
Sub-Saharan Africa (26), excluding South Africa	2.9	2.4	2.0	1.5	1.6	1.6
Europe and Central Asia (5)	33.0	34.1	36.1	35.7	39.7	41.5
Latin America and the Caribbean (28)	70.4	61.3	63.0	50.2	46.4	39.8
High-income European countries (28)	12.3	13.9	15.0	16.5	18.4	21.3
Other high-income countries (15)	86.0	87.8	97.0	115.5	99.1	77.9

Source: FAO, 2013 and agricultural census reports from the 2010 round (see "Agricultural census reports and information consulted" in the References section).

Similar trends in the average farm size are recorded in some other developing regions where after a period of sharp decrease of this indicator this trends slowed down and was inverted during the 2000s and the 2010s. Interestingly middle eastern and northern African average farm land is not one of the lowest among developing regions.

Figure 6: Average farm size over time, by region 1960–2010



Source: FAO, 2013 and agricultural census reports from the 2010 round (see "Agricultural census reports and information consulted" in the References section).

To analyze more in details the trends in this indicator over time and the slope of this change, Table below 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. The first two countries present increase that are very tiny but that while this indicator especially in Turkey remain stable over time and that a consolidation process seems to be reflected in this indicator as well as can be the case or not. Saudi Arabia that passed through several reforms and policies in the agricultural sectors during the period see a consolidation as reflected in this indicator. On the other hand, countries as Egypt and Iran as well as Lebanon and Yemen report a declining trend in the value of average land but at the same time this can interpreted in several different ways and it is particularly interesting to see this in light of the above analysis done with the distribution in share of holdings and farmland. These countries show different trends along the distribution with increasing fragmentation in both the dimensions considered but on the other hand an increasing role of middle size farms and large farms is also recorded, the case of Yemen is different since it is characterized by a least developed country like agricultural system structure. A smooth reduction in the considered indicator is recorded in two middle size countries as Jordan, Morocco and Tunisia where the average farm size is different but even if with several specific issue has given relatively good results historically and in recent decades.

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

	Average farm size						slope of best fit line for average farm size	Number of farms					
country	1960	1970	1980	1990	2000	2010		1960	1970	1980	1990	2000	2010
Algeria		6.2			8.3		0.070		899,545			1,000,000	
Egypt	1.6		1	0.9	0.8	1.7	-0.003	1,600,000		2,900,000	3,500,000	4,500,000	4,400,000
Iran Islamic Republic of	6			4.3	4.1	4.9	-0.029	1,900,000			3,600,000	4,300,000	3,400,000
Iraq	31.8	9.7					-2.210	253,000	591,178				
Jordan		7	5.9		3.3	3.3	-0.104		55,548	62,162		92,258	80,152
Lebanon	2.4	4.3			1.9	1.4	-0.037	127,123	142,811			194,829	169,512
Morocco	9.8				5.8		-0.100	1,100,000				1,500,000	
Saudi Arabia		6.7	10.1		16.7		0.334		180,670	212,157		242,267	285,166
Syrian Arab Republic		9	6.5				-0.250		524,133	485,691			
Tunisia	15.4				10.5		-0.123	325,800				515,850	
Turkey	5		6.2	5.8	6		0.019	3,400,000		3,700,000	4,100,000	3,100,000	
Yemen			2		1.1		-0.045			756,271		1,500,000	

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.

All in all, several trends have been observed in the previous sections regarding the general trends in the holdings and farmland distribution as well as the average land size indicator. A variegated picture comes

out of these analyses and the different regions and states deserve different policy orientations and strategies. Along with these analyses it is important to present the limitations mostly due to the lack of data for recent years even if structural dimensions have been discussed in the previous sections. Other important aspects will be analyzed in the next section before the conclusions we will look at the role of small holders in the perspective of food security and nutrition in selected countries belonging to the region as well as the basic characteristics of labor force in the farms.

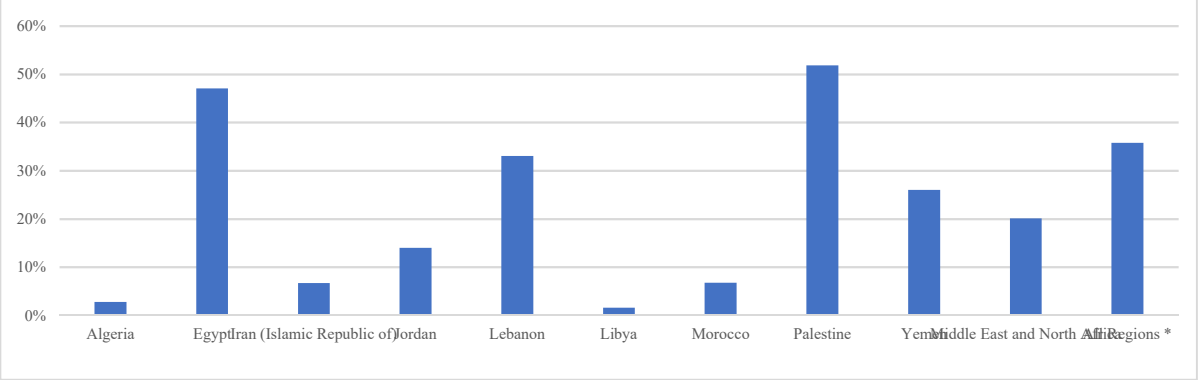
6.1 Food Security and Smallholder Farms

Considering analyses relative to the smallest farms make particularly sense from the point of view of the Sustainable Development Agenda especially for the food security dimension studied here. FAO (2014) showed that family farms (not small farms) produce more than 80 percent of food in the world – a number that was later on further disseminated through Lowder, Skoet and Raney (2016). Graeub et al. (2016) provide an estimate that 53 percent of the world's food is produced by family farms, with family farms being defined on a country-specific basis, with country-specific size limitations imposed. Herrero et al. (2017) combined farmland distribution data from Lowder, Skoet and Raney (2016) with crowd sourcing and satellite imagery to show that farms smaller than 2 hectares produce about 30 percent of most food commodities in sub-Saharan Africa, Southeast Asia and South Asia. At the global level, between 10 and 35 percent of food categories (these include vegetables, sugar crops, roots and tubers, pulses, oil crops, livestock, fruit, fibre and cereals) are produced by farms smaller than 2 hectares.

As has been noted, we estimate that more than 90 percent of farms are run by an individual or a family and rely primarily on family labour, and they are regarded as family farms (Figure 5). Such family farms occupy around 70–80 percent of farmland worldwide and in the Middle East and North Africa region. Here we estimate the share of food produced by family farms using the approach taken in FAO (2014). In order to approximate the share of food produced by family farms irrespective of their size, we use the share of land they operate as a rough proxy for their share of the value of food production. Land is, of course, not the only determinant of agricultural production, but it is an important one of many others, including capital, labor, and research and development.

Using the value of food production in 2015 at the country level and multiplying this by the share of land operated by small farms, we find that the weighted average across countries is 20 percent (out of a sample of 10 countries) as explained below. To do this estimate we make a rough estimate of the share of food produced by farms smaller than 2 hectares, or small farms, for each country, we multiplied the share of land operated by these farms by the value of food production in 2015. Lowder, Sanchez, Bertini shows that the worldwide average (weighted by the value of food production), which points to roughly 36 percent of the world's food being produced by small farms and that suggesting that small farms use only 10 percent of the world's agricultural land may be indication of how very productive they are – but generating more concrete evidence on this goes beyond the scope of this paper. We also see that the share of food produced by small farms varies widely across and within income and regional groupings it is larger in developing regions than in high-income countries and in the region in poorer countries than in relatively richer countries. This share is obviously larger in countries where the share of holdings farm land cultivated as per construction of this indicator but it is in any case interesting to see that the regional average for Middle Eastern and Northern African countries is smaller than the global average and that some countries count very little in general on small-holders production in countries as Algeria, Iran and Libya and Morocco but also others where the share of smallholders is still relevant as Jordan. On the other side of the spectrum there are countries where smallholders represent the largest of the farming system and where other critical conditions exist as Palestine and Yemen. At the same time Egypt reports values that are higher than the regional and global level showing the persistent importance of smallholders in the food security dimension in the Northern African country.

Figure 7 Share of Agricultural Production from Smallholders in Selected Middle Eastern and Northern African countries



Sources: Authors' compilation using FAO, 2001; FAO, 2013 and agricultural census reports from the 2010 round (see "Agricultural census reports and information consulted" in the References section). Value of food production is from FAO, 2019a.

6.2 Other Characteristics of Farms- Labour Force in Farms

As per other dimensions in the agricultural sectors, labour force analysis is a key aspect to be considered in order to analyse the agricultural sectors performance and structure. At the same time, it is important here to observe how the lack of data is particularly relevant in the region and that available information on what concerns this farms' characteristics need to be addressed in the possible developments the agricultural census reporting systems as well as at the national level where these information are provided. Structure of the employment in farms in MENA countries relies mostly on family farms even if the average member of household members employed in the farm are lower than in other developing regions and they are higher in countries as Algeria and Yemen where the presence of household members in the farm is higher than 2 per holding. On the other hand, the presence of hired labour does not seem to be relevant- with the relevant exception of Qatar where the farming system is based on hired labour- and probably the structure of the farming systems involves more temporary workers even though it is not reported in the available data. A clear need for more surveys and census data on this as well as on other farm characteristics is needed to better analyse and provide more oriented policy recommendations.

Table 4: Use of household and hired (permanent and temporary) labour on the farm

Country	Labour					
	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.

7 Conclusions and Main Findings

Agricultural systems in the Middle Eastern and Northern African countries changed their structures and basic characteristics and one of the main reasons of this paper is to emphasize the limitations and the potentials in the sector from the point of view of the land dimension. 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 but it generally lower than 15 per cent in all the countries across the region. However, Agriculture is still of special interest to these countries- at least for some of them- as the whole Arabian Peninsula is majorly dependent on the imports for meeting it food demands. Agricultural development will also need to move away from an overt focus on water-intensive crops like cotton and wheat towards more value-added crops like fruit and vegetables.

This paper relies on agricultural censuses relative to all the countries where they are available. The Food and Agriculture Organization of the United Nations (FAO) has promoted the Programme for the World Census of Agriculture (WCA) since 1950 by providing governments with guidance on standard methodology and contents for their agricultural census. Our findings show that, by and large, there has been a reduction in average farm size in low- and middle-income countries and the opposite is seen for some high-income countries as Saudi Arabia over the period 1960–2010. In recent years (from the 2000 to 2010 round), average farm size has increased in the Middle East and North Africa as well as in other developing regions. At regional level in the MENA region we observe that slightly larger farms smallholder farms account for 65 percent of all farms but operate only less than 10 percent of all agricultural land. Farms in the range of 2 to 5 hectares account for 17 percent of all farms and control 12 percent of the land. On the hand, the largest 5 percent of farms in the region (those larger than 50 hectares) operate more than 25 percent of the regional farmland. Middle size farms are the key actors and the potential for further developments in the sector in the region rely mostly on the fragment of the distribution.

Other findings based on the available data on distribution of holdings and farmland shows that farms smaller than 1 hectare, though representing the larger number of farmers, operate a very small share of the total agricultural area and they clearly represent the level of fragmentation of land distribution characteristic that belongs to many developing. Moreover, it is interesting to observe how holdings smaller than 5 hectares represents more than 80 per cent of all the farm-holders but operates only a fifth of the total agricultural land. In the central part of the distribution, the first group- from 5 to 20 hectares- represents the larger group in terms of share of land but represent only 12 per cent of the total number of farmers while the group of upper-middle they cover a considerable 20 per cent share of the total area being less than 5 five percent of the number of holders. This shows the importance of middle-sized farms in the agricultural scenario in the region. For what concerns the large land category- more than 50 hectares of farm- as stated above they operate more than 30 percent of the regional farmland being less than 5 per cent of the number of farms.

Looking at the possible process of structural transformation in agricultural sectors we look at three countries to analyse the trends. Data relative to Egypt, Iran and Jordan are presented:

- In Egypt, the share of farmland by land size changed more importantly showing a possible beginning of a process of consolidation/transformation at least in this dimension in the considered period: reduction of the share of farmland belonging to the class size smaller than 5 hectares and the contemporary increase of this share of the class from 5 to 10 hectares, a slight decline in the categories less than 50 hectares and a increase of the classes above 50 hectares.
- In Iran, data shows some possible direction towards a process of slow structural transformation in rural areas and in particular in the agricultural sectors such as the reduction of the share of holdings for class size lower than 2 hectares- that though is not reflected in the share of farmland

operated by these farms that remains very low in total- and on the other hand, a consolidation process in the larger farm for what concerns especially the middle and upper-middle categories.

- In Jordan, among land class sizes smaller than 20 hectares only the smaller than 1 increase as consequence probably of the increasing number of farms in this category. More interesting seems the situation of the upper middle-class size categories that with the only exception of the category 100 to 200 hectares show a clear process of enlargement of farms and concentration process in the agricultural sectors. Particularly interesting are two aspects: increase in the category of upper-middle from 20 to 50 and the entrance of large farms in the scenario showing probably the larger influence of international market-oriented farms in the scenario.

Looking at the dimension of food security and the role of smallholders farmers we found that Using the value of food production in 2015 at the country level and multiplying this by the share of land operated by small farms, we find that the weighted average across countries is 20 percent as average in ten countries in the region.

Agricultural censuses themselves can also be improved in many ways and many of these are suggested in the guidance FAO has provided for the 2020 round of the agricultural census (FAO, 2015). For this paper, we also intended to provide further characterization of farms focusing on the labor dimension, but the information found was limited. It could be useful for more agricultural censuses to provide estimates of the ages of farm workers and agricultural holders. Furthermore, information on farm labor tends to be limited to permanent workers and household members such that more surveys should include information on seasonal or temporary hired labor.

Survey modules that cover non-household farms need to be carried out in countries where the agricultural census has been limited to household farms only. For this to happen, additional funding is necessary and FAO's uniform methodology (FAO, 2015, 2018) must be followed. It would be useful to consider ways in which data from agricultural censuses might be used to improve existing FAOSTAT data series and public goods that FAO produces. Integration with other international projects and expansion of Agricultural sectors in the region is an important aspect to be developed to allow to have access to more detailed data and therefore provide more informed policy recommendations to policy makers in the region on critical issues as land and agricultural sectors policies.

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