

AMERICAN UNIVERSITY OF BEIRUT

AGRARIAN TRANSITION AND FOOD SECURITY IN THE
VILLAGE OF KHREIBET EL JUNDI, AKKAR, LEBANON

by
NOUR EL JUNDI

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AN ABSTRACT OF THE THESIS OF

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Major: Food Security

Title: Agrarian transition and food security in the village of Khreibet El Jundi, Akkar, Lebanon.

Background: Lebanon has witnessed an agrarian transition since the 1960s. The transition was manifested by the decline in agricultural share to GDP, as well as, the decrease in Lebanese agrarians. Drivers of agrarian transition varies between Lebanese rural villages. Some common drivers include climate change and rapid urbanization. Residents in rural areas rely on agriculture as their primary source of income. Therefore, decline in agricultural productivity or income put them at risk of food insecurity. Agrarians turn to mitigation strategies like livelihood diversification and migration to reduce food and nutrition insecurity. Limited studies explore the role of livelihood diversification on household food and nutrition security.

Objectives: This study aimed to explore the interplay between agrarian transition, manifested by livelihood diversification, on household food and nutrition security of Khreibet El Jundi residents in Akkar, North of Lebanon. In addition, the study highlighted how livelihood changes can impact the food security of households with a focus on the role of home gardens, gender of the household head and geographical location on food and nutrition security.

Methods: A sample of 160 head of households, whose consent was secured, were surveyed. The sample size represented 40% of the local population and was randomly selected. Each participant was interviewed using four questionnaires: a qualitative questionnaire targeting the agrarian transition, its drivers and changes in livelihoods during the period of 1960-2018, the food insecurity experience scale (FIES) to study food security, the food consumption score to address diet diversity and quality, and the household expenditure module to understand the household expenditure on food. The data was coded and analyzed using Stata/SE version 14.2.

Results: Interviewees adopting a full-time agrarian livelihood constituted most of the studied sample. However, their presence has decreased from 66% in the 1960s to 45% in 2018. The proportion of residents who have diversified their sources of income along with agriculture, or relying solely on off-farm incomes, has increased since the 1960s. Among the studied sample, 45% reported experiencing food insecurity in the past 12 months. According to the global categorization of food security, 29% were moderately food insecure and 16% were severely food insecure. As for diet quality and

diversity, the FCS score pointed out that 85% of the studied sample have an acceptable consumption score, reflecting high dietary diversity. Yet, the agrarians were the highest among those with poor and borderline food consumption scores. This is because of low consumption of meat, fish and dairy products, that they cannot afford. In this study, agrarians were the most vulnerable to food and nutrition insecurity (high FIES and low FCS).

Most of the studied sample (65%) were involved in home gardens, with female head of households showing a higher significant involvement as compared to males' headed households ($P < 0.05$). Yet, the impact of home gardens on household food security or on diet diversity was insignificant. Although, residents who have a home garden tend to consume vegetables more frequently, this association was not significant. Likewise, the gender of the head of household didn't have a significant association with household food security. Livelihood sources only had a significant association with household food and nutrition security ($P < 0.05$).

As for the geographical location, full-time agrarians tend to live in the Akkar coastal plain while others reside in the center of the village. This explains why geographical location had a significant association with livelihoods and food security ($P < 0.05$). In fact, agrarians who tend to live in the coastal plain, were those who reported experiencing food insecurity the most.

Finally, the share of household's income being spent on food and beverages was not significantly associated with food security.

Conclusion: Findings from this study emphasize a significant positive association between livelihood diversification and the household food security status. In addition, living in the coastal plain and having all the household income coming from agriculture, had a significant negative association with household food and nutrition security. Yet, the availability of home gardens, the gender of the head of household, the household's expenditure on food did not have a significant association with on household food and nutrition security. Findings from this study also highlight the importance of focusing on agrarians when addressing food security related issues.

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ABBREVIATIONS

| | |
|------|--------------------------------|
| % | Per cent |
| / | Per |
| = | Equal to |
| AUB | American University of Beirut |
| CI | Confidence interval |
| IRB | Institutional Review Board |
| MENA | Middle East and North Africa |
| NGOs | Non-Governmental Organizations |
| SSA | Sub-Saharan Africa |
| HH | Households |
| NCDs | Non-communicable diseases |

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CHAPTER I

INTRODUCTION

Agrarian transition is a global phenomenon already experienced in many countries. This transition occurs when agricultural sector is disrupted and therefore its contribution to the national GDP declines. In the past, rural areas were constituted of the peasants who are agricultural producers producing for subsistence needs; they rely on family labor and consider the household as a unit of production (Friedman 1992). Yet, the world is witnessing an agrarian transformation where poor rural agrarians are diversifying their livelihood and shifting toward off-farm incomes to overcome the challenges of insufficient farm incomes (Akram and Kay 2010). In low income countries, poor people have no choice but to do some farming to satisfy their daily basic needs (Headey and Masters 2019). Lebanon, a developing country, is still undergoing an agrarian transition. Some of the agrarian transition drivers in Lebanon include government neglect for investing in agriculture; this began after the civil war, where tourism and service investments were prioritized (Massoud et al. 2016). Moreover, climate change and urbanization were contributing factors to the agrarian transition and pushing farmers out of agriculture. Agriculture based-livelihoods are not adequate to support agrarian communities (Limon et al. 2017).

Rural households in Lebanon, who used to depend largely on agriculture for income, are adopting two mitigation strategies: migration and livelihood diversification. Mitigation strategies are often adopted to alleviate poverty and reduce the risk of nutrition and food security. Yet, there is lack of studies in the Arab world and Lebanon specifically on how shifting away from agriculture and diversifying income generating

activities can affect household food and nutrition security. Therefore, this research study aims to address the gap in literature on the association of agrarian transition and livelihood diversification with household food and nutrition security in the village of Khreibet El Jundi in Akkar, North Lebanon, during the 1960s and 2018. It categorizes the data collected into three livelihoods: Agrarians, diversified livelihoods and non-agrarians¹. Moreover, it tackles the role of home gardens, gender of the head of household and geographical location on food and nutrition security. Finally, it intends to understand the interplay between food expenditure and food security. The major working hypothesis is that the agrarian transition and livelihood diversification have an impact on food and nutrition security in Khreibet El Jundi. Diversified livelihoods result in improved income generation which can improve food security (access); however, diversion from agriculturally based livelihoods can lead to less nutritious and diverse diets. There are three sub-hypothesis testing the association between gender of the head of household, presence of home gardens and geographical location on household food and nutrition security. It is hypothesized that women play a vital role in improving food and nutrition security. Studies have shown that women are an important determinant of the household nutritional status. This is because women are the main caregivers of a household; they take greater care of family nutrition and meal preparations improving therefore the household food and nutrition security (Smith et al. 2003). The second sub-hypothesis is that home gardens are an important contributor to household food and nutrition security by increasing availability, accessibility and utilization of nutrient-dense food (Mitchell and Hanstad 2004; Galhena et al. 2013). The last sub-hypothesis is

¹ Agrarians are the residents who rely on agriculture as their only source of income, as for the residents with diversified livelihoods they rely on both farm and off-farm incomes. The non-agrarians rely on non-agricultural activities their primary source of income.

that geographical location increases food availability food and therefore enhances household food security and diet quality (Babatunde and Qaim 2010).

CHAPTER II

LITERATURE REVIEW

A. Agrarian Transition

Agrarian transition of communities is defined as the transformation from rural societies to urbanized and market-oriented societies. Primarily it is when non-urban populations that rely mostly on agricultural-based activities for income shift towards industry and skill-based occupations; it is when rural areas become less and less rural (De Koninck 2004). This transition is one of the most substantial social changes that have taken place in global communities for the last three centuries (Akram-Lodhi and Kay 2012). In developed countries, agrarian transition is considered largely complete; yet, it is still underway in developing societies.

According to De Koninck (2004), this transition was achieved through six major processes:

1. Agricultural intensification
 2. Increasing integration of production into market-based systems of exchange
 3. Accelerating processes of urbanization and industrialization
 4. Migration of rural population within and across national borders
 5. Intensification of new forms of private power to govern agricultural production and exchange relationships
 6. Changes in the relationship between society and nature
- (De Koninck 2004)

The importance of agriculture in the economy is measured by its significant contribution to the GDP of the region. Worldwide, rural areas have been facing a decline in the agricultural sector and its contribution to GDP. In fact, fewer people rely on agriculture as their only mean of survival (Massoud et al. 2016; Sachs 2018). Additionally, agricultural population has decreased. In the 1970s, the agricultural population was 2 billion compared to 1.7 billion non-agricultural; yet, by 2010 the ratio shifted from 2.6 billion agricultural to 4.2 billion non-agricultural population (Borras Jr 2009). Nowadays, rural households have varied their sources of income; they may have an agricultural income as well as a non-agricultural income. They feed their families either from their own food production or by buying food from the market (Holden and Ghebru 2016). Poor rural agrarians are diversifying their livelihood and shifting toward off-farm incomes to overcome the challenges of insufficient farm incomes (Akram and Kay 2010). Agriculture based-livelihoods are not adequate to support agrarian communities (Limon et al., 2017). Moreover, non-agricultural activities are becoming important for the development of rural areas and the identification of rural with agriculture is less and less valid (Van Tongeren 2008). The pace and drivers of agrarian transition differs from one country to another as discussed below.

1. Agrarian Transition in the World

Agrarian transformations differ from one country to another. In Asia, the agricultural sector has witnessed a decline in its GDP share and employment. In addition, rural-urban migration increased resulting in urbanization. The participation of rural households in farm activities had declined as compared to off-far activities. Agrarian change has shaped rural production in Southeast Asia (Winters et al. 2010).

The case in Indonesia is quite similar where the economic and political chaos in the 1960s has disrupted agricultural productivity. Between 1965 and 1990, agricultural share to GDP declined from 56 % to 22 %. This figure has only been decreasing, with agricultural value contributing less and less to the GDP. Furthermore, nearly 61.36% of low income/poor population of Indonesia are people who live in rural areas and rely on agricultural income (Martin and Warr 1993; Zulgani et al. 2018).

As for the agrarian transition in India, it was relatively slow as compared to other countries. The proportion of agricultural workers has fallen slightly from 70% in 1980 to 57% in 2004; also, the industrial employment has improved slowly from 13 % to 19% during the same period. However, academics and farmers agreed that the agricultural sector went through a crisis. For instance, annual agricultural growth fell to as low as 0.6% per year during 1994 and 2004. This was accompanied by a serious increase in farmer's suicides (Lerche 2011).

Although agrarian economy still contributes a significant amount towards the Pakistan's GDP, it has been declining for a while now. The percentage of agriculture income in GDP fell from 24% to 21.8% between 2009 and 2011. One of the main contributors to this decline is the effect of climate change. Like other countries, in rural Pakistan, agriculture is directly or indirectly the main source for livelihood. Yet, it has dropped due to war, floods and earthquakes leaving 48.9% of its population food insecure (Nasir et al 2018; Zhou et al. 2017).

Senegal has seen its average annual growth rate in the agricultural sector decline for several years from 1961 till 2014. The growth rate sits at about 6.3% currently, but the agricultural sector has fallen behind as other areas have seen an increase in productivity. This has decreased the percentage of agriculture towards GDP

from 24% in 1987 to 18% in 2016 (Toure 2019). The agricultural sector only provides 7.8% of production, while employing 73.8% of the rural population and 28% of the labor force, further highlighting the low production output of this economy (Toure 2019).

2. Agrarian Transition in the Arab World

Most of the countries in the Arab region saw the share of agriculture in GDP drop from 12.6% in 1970 to 11.12% in 2000 for different reasons (Belloumi and Matoussi 2009). Climate change and urbanization are among the factors leading to agrarian transition. In fact, climate change is causing water scarcity, and low agricultural yields (Belloumi and Matoussi 2009).

In Jordan, agriculture contributes a small amount towards the national GDP. This wasn't always the case, as the agricultural economy made up about half the GDP during the 1950s and the 1960s. By the 1990s, this figure had fallen to 8%, of the GDP, then 4% in 1998, and most recently less than 3% in 2016 (Kumaraswamy and Singh 2018). This decline has been ongoing since the 1980s due to many factors. Urbanization, climate change, unsuitable soil, and water shortages, all contributed to the decline of agriculture and agrarian production. Regarding the water shortages, in 2014, Jordan was announced as the second most water-starved country in the world (Kumaraswamy and Singh 2018).

Similarly, agrarian livelihood activities are decreasing in Syria. In fact, it's becoming hard for Syrian rural households to rely on farming income solely. Therefore, men are seeking off-farm jobs in the cities (Galie et al. 2013).

Agriculture was neglected in Iraq since the oil boom in 1970s and the boom diverted attention from agriculture. Self-employed farmers are 14% of the workforce. Environmental factors have also impacted the agricultural sector such as the Turkish Dam and irrigation projects which caused reduced water flow. Moreover, the number of Iraqis reporting having not enough food in the past 12 months increased from 25% in 2008 to 48% in 2015 (Woertz 2017; Zurayk 2011).

Also, the agricultural share to GDP in Egypt declined from 29.42% in 1970 to 16.70% in 2000. Investment in Egyptian agriculture decreased from 31% in 1980 to 23% in 1992. Moreover, agriculture per capita expenditure was declining at twice the average region rate. In fact, peasants were considered as a “surplus population” rather than important actors in the society (Ayebe and Bush 2014; Belloumi and Matoussi 2009).

The share of Tunisian agriculture has declined significantly from 46 % of total employment in the 1960s to 23 % in the 1990s. Manufacturing sector took over, where textile and clothing account today for almost half of manufacturing employment. The tourism sector has also increased. The growth of these activities has created new job opportunities for low-income rural workers. It had contributed to the reduction of poverty but also divergence from agricultural production activities. In fact, agriculture grew at a very low pace, 1.8% per year, whereas industrial development was intense; for example, non-food manufacturing industry grew at 17.6% annually (Ayadi et al. 2005).

3. Agrarian transition in Lebanon and Akkar

One of the most important transformations of rural Lebanon since the 1950s is the emergence and expansion of big capitalist farms in Bekaa, Akkar, and the southern

coastal region. These farms focused mainly on growing citrus, sugar beets and potatoes (Nasr 1978). In the coastal Akkar plain, citrus was grown to the benefit of merchants of Tripoli. This has ended the diversification of the crops grown that could benefit the farmers and increased reliance solely on cash crops that supply the demand of the markets which benefits merchants (Nasr 1978).

Moreover, Lebanon was in a transition phase post the civil war. After the Lebanese civil war, the local governments have rarely paid attention to the well-being of the agricultural sector, favoring other industries more oriented towards the development of the urban areas (Trabulsi 2007).

Clearly, Lebanon has witnessed an agrarian transition (Traboulsi 2007). Agrarians have experienced a shift to more diverse off-farm strategies to increase their income and improve their living standards. Agrarian Lebanese are now engaged in urbanized activities such as teaching, industrial work and other services to enhance their household income and indirectly their food security status (Yassin and El Solh 2017). Agriculture-related livelihoods are not adequate to support agrarian communities (Limon et al. 2017). During the 1960s, agriculturally based livelihoods were the basic source of income in low income countries like Lebanon. Small- scale agricultural activities were the source of growth and prosperity since they provide food, labor and a market of goods in the industrial sector (Massoud et al. 2016). Yet, the agricultural sector contribution to Lebanon's gross domestic product has been declining since that time. In 1965, it was 12%, down to 9.4% in 1972 and finally 5% in 2018 (Saade and Chatlila 1994; MoA 2017).

Akkar is known for its history of agricultural productivity. Agriculture is a major source of income for rural families in Akkar. Yet, the 17 years of civil war that

ended in 1990, affected the village's livelihood. For instance, farming as a source of livelihood in Akkar has grown increasingly difficult due to relatively low profitability and the Lebanese civil war (Yassin and El Solh 2017). Villagers are relying on various off-farm livelihoods like running small enterprises, joining the public service as teachers and clerks and seeking urban jobs in Tripoli. The number of full-time agrarians has decreased. Whereas the percentage of residents with diversified livelihood or off-farm incomes has increased (Massoud et al. 2016; Yassin and El Solh 2017).

B. Current Lebanese Agriculture

Agriculture is of minor importance in Lebanon; it contributes to only 5 % of GDP and 8% of the effective labor force (World Bank 2017). In addition, only 9.2% of the Lebanese population is engaged in agriculture (MoA 2010). The rural population in Lebanon accounts for only 12 % of the total population and is considered relatively poorer than the rest of the Lebanese population (CDR 2016). Villagers are engaged in some agricultural-based activities either on a full time or part time basis, including seasonal family labor. In the poorest regions of the country like Akkar, Dinnyeh, the Northern Bekaa and the South, agriculture-related activities are a major contributor to GDP accounting for up to 80 % of the local GDP. The poorest rural households rely on agriculture as sole source of income, as for than better-off rural households, they tend to engage in non-agricultural economic activities as well as in agriculture (FAO 2018). It is important to mention that there are two types of agriculture in Lebanon: commercial and small-scale agriculture. The first type includes large-scale production of cash crops for sale; it relies on advanced technology and mechanization and thus require adequate financial resources. The second type of agriculture is the one adopted the most by small-

scale farmers; it is constituted of farmers selling their products in the local markets for subsistence (CDR 2016). As for pastoralism, it was an important rural livelihood in Lebanon especially in Akkar, Douniyeh and Bekaa. Yet, this sector is declining as a result of lack of grazing land. The number of sheep herds has decreased from 354,400 heads in 2000 to reach 255,000 in 2011 (Sattout 2014).

1. Agriculture in Akkar and Khreibet El Jundi

Farmers in Akkar have shifted their production from subsistence crops to higher value commercial crops (cash crops); potato crops are taking over the Akkar coastal plain. Akkar is considered rich in olive trees as compared to other mohafaza. Almost 18% of olive trees in Lebanon are in Akkar as compared to 15% in the south and 8% in Baalbeck (MoA 2010). It is also very rich in citrus fruits like oranges, lemons and pomelos. The akkar coastal plain has a clay soil favoring the cultivation of vegetables and some fruits. This explains why vegetable crops like lettuce, tomatoes, squash, zucchini and fruits like strawberries are taking over the coastal plain.

During the summer season, the Akkar coastal plain was rich in seasonal vegetables like tomatoes, cucumbers, spinach, peppers, eggplants, zucchini and corn. The common summer fruits included: watermelon, peaches, apricots, cherries and berries. All the above can be found in summer season being grown without relying on plastic housing. Nowadays, the plain is full of plastic houses where you find summer vegetables all year long, which drove down their prices and reduced their quality. The plain is undergoing an agricultural intensification because of its reliance on green houses. As for livestock production and pastoralism, they have drastically declined due to urbanization taking over the grazing land.

In Khreibet El Jundi, agriculture is still important, but it had undergone some changes. Wheat and pistachios were substituted for tobacco and potatoes. The current grown crops, potatoes and tobacco are the dominant ones. This is because potatoes have better market and lower cultivation costs than other available crops. Many agrarians who grow potatoes have contracts with chips companies in Beqaa. As for the tobacco, agrarians require an official permit to grow it and sell the produce mainly to the government. In addition, Khreibet El Jundi has always been famous for olive trees, but the yield was better before. Weather conditions are affecting the yield making it not as stable as before. When the season is good the olive crops produce around 12 tanks as compared to 4 tanks when it is bad. Almost every household has access to olive oil and olives produced in the village. However, many agrarians say that the past two years were the worst in terms of crop yield. Moreover, growing green leafy vegetables is very common like lettuce, cabbage, and spinach. As for the cultivation of fruits, it is very rare in the village, only few residents grow fruits like peaches, pears, figs, citrus fruits and cherries.

C. Elements of Agricultural Degradation in Lebanon

1. Urbanization in Lebanon and Rural-Urban Migration

Lebanon is a Middle Eastern country that is located on the coast to the east of the Mediterranean Sea. The country's population is about 4 million people, with nearly half of those living in or around the capital Beirut (Bahn and Abebe 2017). Lebanon, a middle income developing country acts as a commercial link between the Middle East and Europe. For residents in Lebanon, acquiring food remains a major expenditure category for most households (Euromonitor International 2014; Bahn and Abebe 2017).

Since its civil war that erupted in 1975 and lasted 15 years, Lebanon has undergone massive changes in its population demographics and layout leaving behind drastic consequences on agriculture. The war mainly caused a fragmented urban sprawl (Faour 2015). This movement began prior to the war in the 1960s, when small numbers of the rural population were migrating to the urban cities due to its growth and importance to the working sector (Masri et al., 2002). This migration has caused major impacts to both sides. The rural areas, for example, suffered heavily from land degradation, while the urban areas, with the large influx of population it was witnessing, saw an increase in water demand (Masri et al., 2002). Statistics show that urbanization in Lebanon has increased to 7.22% in 2005, up from 2.16% in 1963. Its capital Beirut is the largest urban area, with Jounieh and Tripoli continually growing annually. Tripoli's urban sprawl most recently overtook the region of Zgharta back in 2005 (Faour 2015). There are several factors that pushed rapid urbanization to the forefront of Lebanese demographic movement, such as consecutive rural migration, suburbanization, war displacements, and influx of refugees.

The increase in urbanization is a major threat to the nearby agricultural lands. These lands, mainly those located in Akkar and Bekaa, along with the coastal plains, are facing constant threats due to the urban sprawl. Coastal plains such as the ones in the south between Saida and Naqoura, the Akkar plain, and the valley of Abou Ali, also known as Koura, are especially vulnerable to constant pressure of urbanization. They are attractive for developers due to their location and exploitability for real estate projects (Habitat III National Report 2016). Moreover, coastal and peri-urban² agricultural lands that remain intact but are becoming closer and closer to the dense urban areas and highways, are being exposed to increased levels of water, soil, and air

pollution. This rapid urbanization is affecting the rural areas by decreasing the availability of agriculture land (Habitat III National Report 2016).

2. Climate Change

There is a direct relationship between climate change and pace of agrarian transition. Farmers, especially in the MENA Region due to its vulnerability to climate change, have to face increasing temperatures, water stress, and extreme weather, which not only affect the product yield but the living conditions and water security of these inhabitants. Furthermore, policy makers have always studied the effects and relationship between climate change and conflict. Although climate change does not cause conflict, it has been found that it increases the damage and dangers that conflicts breed. There is also more pressure on resources, and issues such as political instability, unemployment, down market, and poverty are many times escalated (Sieghart et al. 2018).

The changes in climate in the region and the sporadic weather conditions that Lebanon has been witnessing have further pushed agrarians towards urban relocation. With longer dry spells and increasing temperatures around the Mediterranean area, it is becoming more difficult to grow and sustain certain types of crops which is increasing production costs and lowering the yield that the farmers are reliant on (O'Neill et al. 2017).

According to the Intergovernmental Panel on Climate Change (O'Neill et al. 2017), the frequency and intensity of droughts will continue to increase in the region throughout the 21st century, with an expected increase in temperatures of 2° to 3°. Rainfall will also decrease by 10-20% in the next 20 years, and will see a decrease of up to 45% within this century (Farajalla et al. 2014). All these climate changes that

Lebanon has been witnessing, and will continue to witness, is causing severe heat and dryness, and extended periods of drought.

The sector and population most affected by this change is the poor inhabitants of the agricultural regions that rely mainly on farming as a source of income. The higher temperatures and weather extremities such as floods, intense sporadic rain, heat waves, and frost, are killing off crops and yields on a yearly basis, leaving the farmers with devastating monetary losses. According to Fajralla et al. (2014), climate change will have a direct impact on the productivity of the agricultural sector and the ability to grow crops. For instance, the accumulated productivity change in the agricultural sector due to climate change from 2010 in Northern Lebanon is -8.44%, and this is only due to climate change. (Fajralla et al. 2014)

Clearly, climate change has been affecting the agricultural production and its impact will only continue to increase over the years. This decline in productivity is further forcing agrarians to look for and transition into new income generating sectors that are less affected by the gradual climate change that is taking place. Farajalla et al. (2014) studied the net migration that is taking place from several areas in Lebanon that can be linked to the effects of climate change. He deduced that in Lebanon, climate change has had an increasing effect on net migration from rural to urban over the years. (Fajralla, et al. 2014) This net migration shows the affect that the decrease in agricultural production is having on Lebanon's population. It is not only the agrarians that are being forced out of the business. But other parts of the population that rely on the availability of cheap agricultural produce are being affected also, either by the increased cost of living due to more expensive crops, or the lack of customary labor that is associated in the agricultural cycle that delivers the produce to the end user. The

effect of climate change is being felt more severely in the poorest parts of the country, which is usually home to the agrarians and their working environment (Farajalla et al. 2014). These hardships are another driver for agrarians to migrate out of their current homes and transition to more practical income generating jobs.

With the significant effect that climate change has had on Lebanon, it is imperative that policy makers provide education on guidance for the agricultural sector in order to have a fighting chance (O'Neill et al. 2017). Not all the negative consequences of climate change can be dealt with, however with the right approach and with the help of technology, data, and modeling, the rural agrarians can be better equipped and prepare for unexpected shocks. Such policies would also help sustaining the environment and better allocating the available resources in the country (Sieghart et al., 2018).

D. Livelihood Diversification

Livelihood is the practice of securing the necessities of life, this can include skills, assets, capabilities, and work. As Lipton (1993) states that '200 days a year can be used as a minimum level to create a livelihood'. However, most people tend to face hardships and unforeseen events that affect the livelihood which they rely upon. That is why a sustainable livelihood is one that can overcome and withstand shocks and stresses. In cases where sustainable livelihood is not an option, livelihood diversification takes place (Lipton 1993). Livelihood diversification is defined as the process by which rural families shift toward a diverse portfolio of activities and social support capabilities in order to survive and improve their standard of living (Khatun and Roy 2012). In rural areas, individuals are likely to choose non-agricultural sources of

livelihoods such as casual labour or migration. It is true that livelihood diversification may improve income generation which can indirectly enhance food security (access) but it does not necessarily enhance diet quality (Khatun and Roy 2012). For instance, livelihood diversification can be negatively associated with diet diversity (Ghattas et al. 2013). Some evidence suggests that nutritional diversity is only met through local production (Herrero 2017).

While some agrarians remain in agriculture, others tend to diversify their livelihoods. As agriculture was mechanized during the 1950s and 1960s, villagers were forced to look for new ways of making a living (Yassin and El Solh 2017). Rural people follow two main strategies in conserving their struggle to maintain livelihoods: livelihood diversification which is the mainly adopted strategy, and migration. The first strategy is when individuals and households attempt to find new ways to raise incomes and reduce environmental risk; it includes both on and off farm activities. Rural families start to construct a diverse portfolio of activities and social support skills in their struggle for survival and in order to improve their standards of living (Hussein and Nelson 1998; Ellis 1998). Start & Johnson (2004) defines 'diversification of the rural economy' as the shift of rural activities from farm to off-farm activities, correlated with the expansion of the rural non-agricultural economy. It can be categorized into three components sector (farm or non -farm), by function (wage employment or self-employment) or by location (on-farm or off-farm) (Loison 2015).

E. Food Security

The concept of Food security was first introduced in the 1974 by the World Food Summit and it was defined as:

“Availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices”

In 1983, FAO expanded this concept to pay attention to vulnerable people by focusing on securing physical and economic access to all the people. The World Bank report has further elaborated the concept in 1986 to include the temporal dynamics of food insecurity. It distinguished between chronic food insecurity resulting from poverty and low income and transitory food insecurity associated with natural disasters and conflict (FAO 2012).

Later on, the 1996 World Food Summit adopted a more complex definition by highlighting the importance of access to safe and nutritious food with special focus on individuals’ food preferences (FAO 2012). Finally, the definition of food security was lastly modified by the State of Food Insecurity (2001) and is now defined as the following:

“Food security is a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”.

The present definition of food security is divided into four pillars: availability, accessibility, utilization and stability. The first pillar addresses the supply side of food security; it includes domestic food production, imports, and food aid and food stocks. The second pillar is concerned with the access to the available food (FAO 2012). It tackles issues of equitable distribution, appropriate infrastructure and food affordability. As for the utilization pillar, it is highly involved with individuals’ access to high-value nutritious and safely prepared food containing the energy and nutrient intake needed for

a proper life food. Finally, stability of all three pillars is important to ensure that the individual will always have access to adequate food regardless of adverse conditions such as climatic and political instabilities (FAO 2012). Furthermore, achieving food security falls under the “End hunger” target of the 2030 Sustainable Goal agenda. This SGD²² tackles issues related to food security, nutrition and sustainable agriculture. It focuses on decreasing the prevalence of undernourishment and the severity of food insecurity (FAO 2018).

1. Case Studies

According to the latest report of FAO regarding the state of food security and nutrition in the world (2018), the number of undernourished people has been on the rise since 2014 increasing from 10.6 % in 2014 to reach 10.9% in 2017. Moreover, severe food insecurity using the Food insecurity experience scale (FIES) is increasing. Severe food insecurity means this person runs out of food or has gone an entire day without eating at times during the past year. Global food insecurity has increased from 8.9% in 2014 to 10.2% in 2017 (SOFI 2018). The Middle East and North Africa (MENA) is the world’s largest importer of poultry, cereals, and sugar. Their import dependency, which has started increasing since the early 1970s, put them at a greater risk to food insecurity. Relying heavily on imports has a negative impact on food availability (decreased domestic production). Therefore, increased domestic agricultural production must be taken seriously as a mean to ensure food security (Kumaraswamy and Singh 2018).

Lebanon is one of those MENA region countries highly reliant on imports, which make it vulnerable to climate change and external shocks (Hwalla and Bahn

² Decreasing the prevalence of undernourishment and severity of food insecurity, fall under SDG 2.1.1 and SDG 2.1.2, respectively (FAO 2018).

2015). Severely food insecure Lebanese population has accounted for 21.1% in the Beqaa valley and 10% in the South of Lebanon (Naja et al. 2015). Akkar, the far North of Lebanon, is the poorest area in Lebanon; yet there is a lack of data on household food and nutrition security (Carpi 2014).

It is believed that nonfood producers are at a higher risk of food insecurity than food producers (SOFI 2018). In addition, a survey based on the Household Food Insecurity Access Scale (HFIAS) was carried out in the peri-urban area around Tripoli, Lebanon and Amman, Jordan, has indicated that 51% of respondents were food insecure and “that food producers were more food insecure than non-food producers” (Naja et al. 2015; Sayhoun et al. 2014).

Food insecurity has been affecting more and more people in the world, increasing by 44 million people in just 2 years to reach 124 million between 2015 and 2017 (FAO 2018). This is the prevalent case in Lebanon also, as more than 10% of Lebanese households are vulnerable to food insecurity, with nearly 49% without access to constant food (MoA, WFP, FAO). A food security assessment was conducted by Jomaa et al. (2017) where 378 Lebanese households were interviewed. 50% were food secure, 8% mildly food insecure, 16% moderately food insecure, and 26% were very food insecure (Jomaa et al., 2017).

Another study was conducted by Sahyoun et al. in 2014 specifically for the Bekaa Valley and Tyre and the food security of the inhabitants there. In Bekaa the HFIAS indicator was used for the research, the results were 48% secure, 17.7% mildly insecure, 12.9% moderately insecure, and 21.1% were very insecure. In Tyre, the Arab Family Food Security Scale was used (Sahyoun et al. 2014). On average only 52% of

the inhabitants were food secure. These figures align with the findings of Jomaa that was conducted on a wider scale.

A further study on low income households and food insecurity which they faced showed that food insecurity was a huge problem in that demography. Studies conducted in Tripoli and Amman Jordan showed that only 51% of the low income population was food secure. Two contributors to this statistic that were found to have a positive correlation with food insecurity were household size and poorness (Hamade et al. 2014).

Akkar, located in the North of Lebanon, is one of the most marginalized and deprived regions. Yet, there is lack of data on the food security status of Akkar residents. Akkar has been underdeveloped before the civil war, and did not witness any major investment, except for some very limited infrastructure construction (Hamade 2011). There is an economic gap between the capital Beirut and peripheries of Akkar. It has the highest poverty rate in the country. Poor farmers make up 66.21% of total holders in Akkar (Carpi 2014). Moreover, it has the lowest average individual income level and highest illiteracy rate in Lebanon (Mouchref 2008). The region is characterized by a dense population and shows all the typical features of a poor, isolated and deprived rural community (Mouchref 2008).

Akkar has been neglected by state economic policy and development projects. The constraints to agricultural development in this region include: the high level of illiterate holders, price falls and the lack of adequate public support to farmers although the region has favorable conditions for agricultural production, such as greenhouses production (Hamade 2011). The Akkar coastal plain is fertile and rich with water. Almost 43% of agricultural land is irrigated. As for the central part of Akkar, it's

convenient for non-irrigated crops like olives and cereals (Hamade 2011). The interrelationship between poverty and agriculture in Akkar is not linked to low land productivity which leads to low farmer income. Instead, this interrelationship is related to a poor supply chain organization (Hamade 2011; Yassin and El Solh 2017). The poor agricultural income is pushing Akkar's residents to quit agriculture and undergo an agrarian transition. In fact, the residents are diversifying their livelihoods and seeking other employment alternatives. Khreibet El Jundi village is next to Halba (capital of Akkar) and is one of those villages experiencing the agrarian transition and livelihood diversification.

F. Food Security and Livelihood Diversification

1. Case Studies

There is lack of studies in the Arab world investigating the association of livelihood diversification with household food security. Therefore, the case studies will include studies from around world.

A study done in West Timor, Indonesia, investigated the effect of transitioning away from agricultural activities and engaging in artisanal and small-scale mining like Manganese extraction. Predominantly, the economy of West Timor used to rely on agriculture and more than one million rural households adopt subsistence farming. However, agriculture in Indonesia has been facing major challenges like disrupted rainfall, low soil fertility and increased levels of erosion (Booth 2004). These challenges have exacerbated rural household food insecurity, particularly during the 'hungry season'³. Therefore, rural residents have shifted their livelihoods toward non-farm

³ Hungry season refers to the time before the harvest if previous year's produce was low (Fisher et al. 2019).

occupations. The proportion of rural farmers engaged in mining-related activities accounts for 70% across five districts in Indonesia and results have shown that this livelihood diversification helped farmers to overcome the challenges of food insecurity (Fisher et al. 2019). Poor rural development challenges in Indonesia were like those in Sub-Saharan Africa (SSA) like poor infrastructure (Booth 2004).

Livelihood diversification is adopted in SSA so that households can fulfill their basic needs and increase their resilience against shocks. In fact, having a diverse source of income can backup households (HH) when income from agriculture fails; for example, in case of droughts (Loison 2015). This alternative source helps HH in purchasing food from the market. Loison (2015) emphasizes small holders in SSA are adopting livelihood diversification either through off-farm activities or migration mediated by infrastructural development and better access to urban areas. Moreover, SSA is becoming less rural where residents are also diversifying their incomes and seeking off-farm incomes through involvement in micro-enterprises. Therefore, livelihood diversification is becoming very popular, Sahalian people prefer to diversify their income rather than intensify their primary agricultural production activities. They believe that livelihood diversification is important when primary incomes fail. It also satisfies the need of household to purchase other essential goods and services. (Hussein and Nelson 1998; Loison 2015).

A study investigating rural livelihood diversification' effect on household food security in Northern Ethiopia has shown that 74.2 % of the studied sample are food insecure (Robaa and Tolossa 2016). 66.7 % of those with diversified livelihoods (engaged in non-farm activities) are food insecure whereas 7.5% of those who are not engaged in farming activities are food insecure. Migrating out of agricultural-based

activities helped in alleviating food insecurity in Northern Ethiopia (Robaa and Tolossa 2016).

Another study done in Ghana, addressing also the effect of household income diversification on food security supports that engaging in non-farm work result in a positive and statistically significant effect on household food security and poverty alleviation (Owusu et al. 2011).

G. Food and Nutrition Security

Food and nutrition security refer to ‘a situation that exists secure access to an appropriately nutritious diet is coupled with a sanitary environment, adequate health services and care, in order to ensure a healthy and active life for all household members’ (FAO 2012). Nutrition security differs from food security in that it also considers the aspects of adequate caring practices like child nutrition, immunization, health and hygiene in addition to dietary adequacy (FAO 2012). The statistics regarding global food and nutrition security are alarming. Hunger and malnutrition are increasing. The number of undernourished or chronically food deprived people in the world, has increased from around 804 million in 2016 to reach 821 million in 2017 (SOFI 2018). Therefore, almost one out of every nine people in the world are undernourished. The same goes for global food insecurity, which has increased from 8.9 % in 2014 to 10.2% in 2017. The world most vulnerable people are the net food buyers (SOFI 2018; FAO 2018).

H. Livelihood diversification and food and nutrition security

1. Case Studies

Literature focuses on addressing the association of livelihood diversification with food security without a special focus on nutrition security. Nutrition security focuses on household nutritional status including calorie supply, diet diversity and prevalence of undernourishment.

When it comes to rural communities, food production practices are said to protect households from food insecurity and poor nutritional outcomes (Ghattas et al., 2013). A study was conducted on rural Bedouins in Lebanon to test this theory. By working the fields and depending on their farming and herding, Middle Eastern Bedouins have been able to secure a livelihood and diversify their diets intake to include a wide variety of nutrition, from milk and cheese to wheat, barley, and vegetables. However, the regional policies that were put into effect from the 1960s and the vast migration to urban areas have forced the Bedouins to establish themselves in settlements. This created an obstacle in accessing the land required to continue their diversified agricultural lifestyle, which forced some to quit and move on to paid jobs. The Bedouins are now relying on their income to purchase food and groceries from the market place instead of growing it themselves. According to a study by Ghattas et al. (2013), it was found that food insecurity had a negative relationship with household food production score, meaning food insecurity is higher in households with lower food production. Moreover, food insecurity was negatively associated with the consumption of fruits, meat chicken and fish. Shifting away from agriculturally based activities had a significant negative association with household food security and diet quality of the rural Bedouins in Lebanon.

Different results were found when a similar study was done in two Lebanese villages, Nabha and Batloun. Results in Nabha have shown that the full-agrarians, engaged in agricultural-based livelihoods, are the most vulnerable to food insecurity. 57% of the full-agrarians were experiencing moderate and severe food insecurity, followed by residents who have completely migrated from agriculture. Residents with diversified livelihood are those with the lowest percentage of food insecurity. The sample studied had an acceptable food consumption score (FCS) reflecting good diet diversity. This is because during hard times, they rely on mouneh which includes shanklish and kishk (good protein source), along with fruits in the form of jams and olives. However, the association of livelihood sources with food and nutrition security was not statistically significant. Additionally, when the same study was carried out in Batloun, the prevalence of food insecurity was the highest among participants (6%) who have transitioned away from agriculture followed by participants with diversified livelihoods (2%). 96% of the studied sample had an acceptable FCS with a high mean of 77, reflecting a rich diet diversity. Yet, the association of income source with food and nutrition security was insignificant.

There is a lack of studies investigating the impact of livelihood diversification on food and nutrition security in the Arab world.

Studies done in Nigeria exploring the impact of off-farm income on food and nutrition security, found that income diversification enhances food availability, food accessibility and food utilization and therefore overall stability (Dedehouanou and Mcpeak 2019). Off-farm incomes in Konduga, Nigeria include handicrafts, shop-keeping, remittances and other local services. A study found out that off-farm income contributes to higher household income and therefore better nutrition and food security

status since healthy nutritious foods are more expensive. Dietary quality was significantly higher in households with off-farm income with higher total caloric intake, and higher vitamin A and Iron daily supply. Moreover, children in households with off-farm income presented lower levels of stunting, wasting and underweight (Babatunde and Qaim 2010; Dedehouanou and Mcpeak 2019).

Another study done in Kenya, assessed the effect of household income diversification on food and nutrition security. The data was collected from Kutus town in the Kirinyaga district of Kenya; this town has seen a decline in agricultural productivity for many reasons including low levels of education, shortage of labour and challenges in the supply of agricultural inputs (Evans and Ngau 2000). Therefore, residents adopted livelihood diversification as a mitigation strategy; these include relying on off-farm business, engaging in salaried jobs and depending on remittances and gifts. Results of this study has shown that diversifying income from agriculture increases households' insurance against the risks of farming. This led to increased consumption of high nutritional value foods and increased household food security status. Also, results indicated that non-farm income boosted household's total income, enabling the consumer to diversify from food into non-food items (Evans and Ngau 2000).

I. Role of Home Gardens in Nutrition Security

A home garden is defined as small-scale production system which supply households with plant and animal consumption (Galhena et al. 2013). Home gardens have many characteristics. To state some, they don't require a lot of capital and relies only on simple technology that poor rural families can afford. They refer to the

cultivation of a small piece of land next to the household or within walking distance. They contain diversity of plants including vegetables, fruits, plantation crops, spices, herbs as well as livestock. Home gardens can serve as a supplementary source of income and food for the household. Home gardens have three benefits that can be grouped into 3 categories: social, economic and environmental benefits. First, it can enhance food and nutrition security by increasing availability, accessibility and utilization of food. Second, they can increase household income thus improve its livelihood (Mitchell and Hanstad 2004; Galhena et al. 2013). Studies have shown that home gardens can play a role in poverty reduction and rural development particularly in developing countries. Third, environmental benefits are seen in home gardens by adopting ecologically friendly production techniques. They also conserve biodiversity and natural resources (Galhena et al. 2013). They're common in developing countries like Asia, Africa and Latin America.

Home gardens are a common sight amongst the households that were surveyed in two different studies in two different areas. These home gardens are either used for personal consumption or to an extent for commercial purposes. The most recent study of the Batloun region showed that nearly 91% of the residents relied on some sort of home garden either personal or commercial, with 73% of them using it strictly for personal use. These figures are close when the residents were asked about the period of 1990. About 87% owned home gardens then; the only difference is that in 1990, more households used their home gardens for commercial purposes, with only 35% owning exclusive home gardens for personal use. The other study in Nabha also revealed a high number of agrarian home garden owners. 81% of those surveyed indicated that they have and look after a home garden.

CHAPTER III

METHODOLOGY

This study aims at understanding the agrarian transition that occurred in Khreibet El Jundi starting before the civil war to the fall of 2018. The choice behind this timeline is to understand the effect of civil conflicts on food security. In fact, civil conflicts like the Lebanese civil war affect rural populations whose economies rely on agriculture. Conflict damages agricultural sectors, interrupts food production system, ruins assets and rural livelihoods leading to food insecurity and malnutrition (Bahn et al., 2018). A mixed method study including a quantitative survey with semi-structured interviews was used.

First, the qualitative survey was analyzed using thematic analysis to identify recurring themes and address livelihood changes. It was intended to understand the main drivers for agrarian transition in Khreibet El Jundi. In addition, it helped in examining how agrarian transition is manifested by livelihood diversification and what kind of livelihoods are the residents adopting in 2018 as compared to the 1960s. Then the two indicators used to assess food and nutrition security, the food insecurity experience scale “FIES” and the food consumption score “FCS, were interpreted. Data from the quantitative and qualitative parts of the research were entered and analyzed using Stata/Se 14.2.

A. Study Area

The study area is the village of Khreibet El Jundi located 115 km from Beirut and covers an area of 5.5 Km² and expands along the river valley of Al-Estwan river.

The number of people residing in the village is about 4000 individuals. The average household size in Akkar is 7 and is the highest in Lebanon (UNDP 2018). As such, the number of households is estimated at 400 households. The village has a Mediterranean climate characterized by rainy winter and dry and arid the rest of the seasons. The village of Khreibet El Jundi, like many other villages in Akkar, used to rely on agriculture as their main livelihood, where all the family members work together to grow crops and sell them at the Akkar souk market or in the Tripoli market. In fact, what makes this village special and rich in agricultural activities is the presence of Akkar's large fertile coastal plain which is 100 m away from the sea. The Akkar coastal plain has a sandy soil suitable for the cultivation of the following crops: cereals, vegetables, and olives and some fruits like peaches and cherries. Yet, many residents are either transitioning away from agriculture-based livelihoods or diversifying their incomes.



Figure 1: Map of Akkar



Figure 2: Map of Khreibet El Jundi map divided into two zones: Coastal plain (zone 1) and central Khreibet El Jundi (zone 2).

Legend: Green area represents Khreibet El Jundi coastal plain (zone 1)
Brown area represents the center of Khreibet El Jundi (zone 2)

B. Sampling

The sample size was calculated using the simplified formula of proportions below (Yamane 1967); where n is the sample size, N is the number of households, e is the level of precision (sampling error) equal to 0.05.

$$n = \frac{N}{1 + N(e)^2}$$

In the case of Khreibet El Jundi: $n=200$ households (50% of the population).

The sample size was selected randomly to ensure the sample includes variability in terms of livelihood diversification and all members of the population have equal rights of being selected. With the help of a municipality member, a list containing all household's phone numbers in the village was purchased. These numbers were entered into Microsoft excel and the system chose randomly 200 of them. If a young

head of household, one that is born in the 1980s was randomly selected for the interview, then they were asked about their fathers' livelihood in order to gather information about the 1960s.

Upon implementation, the studied sample was narrowed to 160 households (40% of the total population) because of the weather conditions which impacted the access to the village and the data collection process. Furthermore, although the response rate was high, 10 people out of the randomly selected 200, refused to participate in the project. So the sample was restricted at 170 participants but excluded 40 including those who refused to participate. For instance, it was very challenging to conduct 160 interviews since citizens were not very interested in participating in such interviews. This is because they have already been approached by different NGOs who always promise that these interviews aim to implement new projects in Akkar but they actually haven't seen anything yet. Citizens are fatigued and disappointed from hopeless interviews.

Therefore, 160 in-depth interviews were done. Data was analyzed quantitatively and qualitatively after 3-months of data collection taking place from the end of October 2018 till December 2018.

B. Data Collection

After choosing 160 head of households randomly, phone calls were done to schedule an appointment with each participant. Participants were shown the consent forms and introduced to the project. Upon approval, interviews were initiated, and they included four survey tools:

1. Livelihood questionnaire

2. Food consumption Score
3. Household Expenditure Module
4. Food Insecurity Experience Scale

1. Livelihood Questionnaire

To understand the agrarian transition happening in Khreibet El Jundi along with the shift in agrarians' livelihoods, a quantitative survey of 8 questions was carried out. This survey was done using a timeline between 1960s and 2018. Each question will be asked twice; once for the period of the past 12 months and the second for the time in the 1960s. This specific period was chosen after doing a pilot study with residents of Khreibet El Jundi. Residents reported that this period is very critical to the village because: 1) it's prior to the civil war 2) export markets were better 3) control over imported foreign products was higher. The Lebanese civil war has affected agriculturally based livelihoods and agriculture was almost their only livelihood. Lebanese products were being exported to many countries like Saudi Arabia and other Gulf countries, and Jordan. This export trend started declining; these countries started growing their own crops and restricted imports. This period being prior to the civil war and during it shows the changes that the conflict and fighting had on agriculture. Before the Lebanese civil war, the government used to protect farmers by restricting imports of some crops like apples, citrus fruits, olives, grapes and potatoes.

The survey includes questions about the livelihood adopted now vs. the one adopted in the 1960s. Changes in agriculturally based livelihoods were considered as an indicator of agrarian transition. Participants were asked if they have any agricultural income now as compared to the 1960s. In case they have an agricultural income, does

agriculture accounts for a little, half or all their income. Moreover, this survey tackles the household's important crops for own consumption and important crops for sale. In addition, it contains questions about the presence of home gardens and the motivation behind having one. It aims to understand if home gardens or farming help in providing food to their households and to what extent; and if home gardens help in saving on food expenditure.

2. Food Consumption Score (FCS)

The Food consumption score was used to assess the association of agrarian transition and livelihood diversification with diet quality and food security. In fact, the World Food Program (WFP) designed the Food Consumption Score to capture both the diversity and diet quality while measuring food security (WFP 2008). The food consumption score divides the household's diet in the past seven days into weighted categories depending on the nutritious value of the food consumed. The frequency of each of the nine food groups' consumption is multiplied by its designated weight based on its nutritional value and then all the scores are summed up to obtain the total FCS score as shown in figure 2.

| | Food groups | Food items | Weight (definitive) |
|---|------------------------------------|---|---------------------|
| 1 | Main staples Cereals and tubers | Maize , maize porridge, rice, sorghum, millet pasta, bread and other cereals | 2 |
| | | Cassava, potatoes and sweet potatoes, other tubers, plantains | |
| 2 | Pulses | Beans. Peas, groundnuts and cashew nuts | 3 |
| 3 | Vegetables | Vegetables, leaves | 1 |
| 4 | Fruit | Fruits | 1 |
| 5 | Meat and fish | Beef, goat, poultry, pork, eggs and fish | 4 |
| 6 | Milk | Milk, yogurt and other diary | 4 |
| 7 | Sugar | Sugar and sugar products, honey | 0.5 |
| 8 | Oil | Oils, fats and butter | 0.5 |
| 9 | Condiments | Spices, tea, coffee, salt, fish power, small amounts of milk for tea. | 0 |

Figure 3: Food consumption score (FCS) of different food Groups along with their current standard weights (WFP 2008).

The consumption of some food groups show diet diversity but of low nutritional value, such as cereals, tubers, sugar and fat. For this reason, because of the high consumption of sugar, tubers and fat in Khreibet El Jundi, the cutoff points recommended by the World Food Programme (WFP 2008) which has the following food consumption classification: poor = 0-21, borderline =21.5-35, acceptable = >35, are not used in this study. Instead, adjusted cutoff points were used; these were developed for studying food security of the Syrian refugees and the vulnerable Lebanese hosts in Lebanon (VaSyr 2017). The adjusted food consumption score cutoff points are as follows: poor 0 - 28, borderline 28.5 - 42, and acceptable = > 42.5. The highest score that can be recorded is 112. This score shows that all food groups were consumed daily in the past 7 days.

3. Household Expenditure Module

The expenditure model is a method used to estimate the income of a household by analyzing the expenditures. Participants are given a survey to fill what inquiries about a household's spending habits and totals. The expenditure model divides all possible expenditures into 9 categories, with the categories being examined on different time intervals, daily, monthly, or yearly. This method was derived from VASyR (2017) and the Lebanese Central Administration of Statistics to collect and analyze such information. Furthermore, it was recently used in projects assessing the association of agrarian transition with household food security in two others Lebanese villages which are Chouf (Weber 2018) and Nabha (Amhaz 2019). Once the information is collected and extrapolated, it was possible to estimate the percentage of food expenditure per month.

4. Food Insecurity Experience Scale (FIES)

This survey investigates households' experiences of food insecurity through 8 'yes' or 'no' questions on their ability to acquire food (access). As shown in the figure below, the scale is divided into three main categories: uncertainty about obtaining food, compromising on food quality and quantity and staying without food for a whole day or more. FIES is adopted by the United Nations and Food and Agriculture Organization (2012) as an indicator to address the target 2.1 of the 2030 Sustainable development goal agenda (SDG 2.1). This target falls under the SDG2 aiming to end hunger. Yet, SDG 2.1 focuses on ending the prevalence of undernourishment as well as severe food insecurity experienced on an individual or household level. FIES was used over 150 countries to collect data on national changes of food security (FAO 2012).



Figure 4: The set of eight questions composing a scale that covers a range of severity of food insecurity (FAO 2012).

The questionnaire quantifies the participants' experience, with a lower score indicating acceptable food security and a higher score indicating food insecurity (each question increases in food insecurity severity). The participants' cumulative score is then added to get what is called a raw score. This number was then categorized according to a global scale developed by FAO (2012). The global scale categorizes the participants as follows: a score of 0-3 means food secure and belongs to Category I, score of 4-6 is moderately food insecure and is in Category II, finally scores of 7 and 8 are considered severely food insecure and fall in Category III. These eight qualitative questions were then analyzed using Stata/SE version 14.2 to measure prevalence and severity of food insecurity ranging from mild to severe food insecurity among different variables such as livelihoods, gender, geographical location and the presence of home gardens (SOFI 2018).

D. Statistical Analysis

The information obtained from the previous four modules and surveys were uploaded onto an excel sheet and numerically coded and analyzed using the Stata software version 14.2.

The questionnaire was read and analyzed, with key information and points being categorized together to compare each resident's lifestyle. The data obtained helped draw a clearer picture of the livelihood transition that these people went through in the period 1960 up till 2018. Types of livelihoods were categorized into three different forms:

1. Non-Agrarians – have no agricultural income
2. Diversified Livelihood – partial agricultural income and partial non-agricultural income
3. Full Agrarians – total income from agriculture

Furthermore, data regarding the percentage of residents with home gardens and the types of crops being planted was recorded. This data along with the changes in livelihood provided a steady foundation for analyzing the agrarian transition that has occurred in Khreibet El Jundi. The quantitative data recorded from the FCS, FIES, and the expenditure model was analyzed. Both continuous and categorical variables were used, and the statistical tests were conducted in reference to these variables. Results were considered statistically significant at $P < 0.05$. The following table displays the various tests used in the analysis.

E. Ethical Approval

Ethical approval from the Institutional Review Board (IRB) of the social behavioral sciences at the American University of Beirut (AUB) was granted for the research study with all the assessment questionnaires before the data collection phase.

Table 1: Statistical tests conducted by topic of analysis

| Topic | Dependent Variable | Independent Variable | Test & Result |
|--|------------------------------------|--------------------------|------------------|
| Agrarian Transition | 1960 Livelihood | 2018 Livelihood | Cross tabulation |
| | | | Proportion test |
| Livelihoods and Gender/ geographical location/ home gardens | Gender HH | Current livelihood | Chi-square test |
| | Geographical location | Current livelihood | Chi-square test |
| | Presence of Home gardens | Current Livelihood | Chi-square test |
| Food and Nutrition Security | FIES | Current Livelihood | Chi-square test |
| | | Gender head of household | Chi-square test |
| | | Home garden | Chi-square test |
| | | Geographical location | Chi-square test |
| | | Food expenditure | Chi-square test |
| | | Food expenditure | Scatter plot |
| | FCS | Current Livelihood | Chi-square test |
| | | Gender head of household | Chi-square test |
| | | Home garden | Chi-square test |
| | FCS (Meat consumption) | Current Livelihoods | Chi-square test |
| | FCS (Fruit/vegetables consumption) | Current livelihoods | Chi-square test |
| | FCS (Fruit/vegetables consumption) | Home Gardens | Chi-square test |
| | | Expenditure on food | Chi-square test |
| FCS | FIES | Scatter plot | |
| | FIES | Regression test | |

CHAPTER IV

RESULTS

The research study included participants from different age groups and from both genders. The age of participants in the study varied between 27 and 82. Out of 160 households, 122 (76%) participants were males and 38 were females (24%). The participants' geographical residence was divided into two zones: the coastal plain and center of the village. There was a variability of livelihoods adopted among the households. Changes in livelihoods were studied to understand their association with household food and nutrition security. The results followed by the discussion, were divided into three sections: A) the agrarian transition, B) livelihoods disaggregation for gender, home gardens and geographical location, C) food and nutrition security.

A. The Agrarian Transition

Agrarian transition in Khreibet El Jundi, is manifested by livelihood diversification. Many farmers' livelihoods are now based on diversified economy to confront challenges of food security. Moreover, some have quit agriculture and transitioned toward urbanized livelihoods.

The livelihoods of the village's permanent residents are categorized into three groups:

1. Agrarians: those with income exclusively from agriculture
2. Diversified: includes residents who, in addition to their agriculturally based livelihood, have another livelihood away from agriculture.
3. Non-agrarians: those who have transitioned away from agriculture.

The agrarian transition and livelihood changes were examined through a mixed method study including a quantitative survey complemented with semi-structured interviews. Qualitative data was analyzed using thematic analysis to identify recurring themes (livelihoods). Participants are asked about their current livelihoods and those adopted in the 1960s. The two indicators used to analyze the effect of agrarian transition on food and nutrition security are the food insecurity experience scale “FIES” and the food consumption score “FCS. Quantitative data was entered and analyzed using Stata. Data from the quantitative and qualitative parts of the research project were triangulated to answer the research questions of this paper “What is the effect of the agrarian transition and livelihood diversification on household food security of the Lebanese residents in the village of Khreibet El Jundi”?

1. Livelihoods 1960s-2018

Table 2: Livelihood sources during the 1960s and 2018 as reported by the residents of Khreibet El Jundi (n=160).

| Livelihood sources | 1960s | 2018 | P-value * |
|---------------------------|--------------|-------------|------------------|
| Agrarians | 106 (66%) | 73 (45%) | 0.000 |
| Diversified | 21 (13%) | 48 (30%) | 0.000 |
| Non-Agrarians | 33 (21%) | 39 (25%) | 0.000 |
| Total | 160 (100%) | 160 (100%) | 0.000 |

*Comparison of livelihood sources between 1960 and 2018 were tested using χ^2 test (P < 0.05 was considered to be statistically significant).

As shown in Table 2. there has been a change in livelihoods adopted by the residents of Khreibet El Jundi during the period between 1960 and 2018. The sample studied, which included 160 head of households randomly selected, shows that the

proportion of agrarians has decreased from 66% in 1960 to reach 45% in 2018. Yet, residents with diversified livelihoods have increased from 13 % to 30 % in 2018. Likewise, the proportion of non-agrarians who have transitioned away from agriculture, has also increased from 21% to 25%.

A proportion t-test was done to study the significance of livelihood changes between 1960 and 2018; the results show that the transition in livelihoods is significant at 95% CI. This means that there has been a significant transition in the livelihoods adopted by Khreibet El Jundi residents since 1960s till present. The table below highlights how each livelihood has evolved.

2. Livelihood Transitions 1960-2018

Table 3: Changes among livelihoods 1960-2018 (n=160).

| 1960 livelihoods | 2018 livelihoods | | | | |
|----------------------|------------------|-------------|---------------|------------|----------|
| | Agrarians | Diversified | Non-Agrarians | Total | P-value* |
| Agrarians | 70 (66 %) | 21 (20%) | 15 (14%) | 106 (100%) | 0.000 |
| Diversified | 0 (0%) | 20 (95 %) | 1 (5%) | 21 (100%) | 0.000 |
| Non-agrarians | 3 (9%) | 7 (21 %) | 23 (70%) | 33 (100%) | 0.000 |
| Total | 73 | 48 | 39 | 160 | 0.000 |

*Comparison of changes among livelihoods between 1960 and 2018 were tested using χ^2 for trend test ($P < 0.05$).

a. Livelihood changes of the 1960's agrarians

i. Agrarians Who Remained in Agriculture

106 individuals that were surveyed reported being full agrarians in the 1960s; this number has decreased to reach 73 agrarians in 2018. Out of the 106 participants, 70 remained in agriculture, 21 have diversified their livelihood and 15 participants have shifted completely towards a non-agrarian livelihood.

Those who remained engaged in full-time agricultural activity (70 out of the 106) reported their endless attachment to the land as one of the main factors in continuing their daily work on the fields. They consider the land as their safety tool. It is inherited from their grandparents and consider agriculture to preserve their culture and identity, since Akkar has always been an agricultural area. Yet, they have shifted the crops that they grow. Many crops that used to be grown back in the 1960s are not present now. Khreibet El Jundi was very famous in growing pistachios, wheat, and to an extent, potatoes in the 1960s. These crops were exported or sold in both the Tripoli and Akkar markets. However, nowadays, wheat and pistachio crops are rarely present; they have been replaced by potatoes and tobacco. The reasons that have pushed farmers to shift away from growing wheat are the following. First, the village had a huge wheat mill where citizens invest in it and take flour in return. Second, the government used to purchase wheat from farmers. For instance, many agrarians used to declare to the government that they're growing 2 hectares which produces 4 tons of wheat. 'The government would take 1 kg of wheat for 500 L.L in the past. However now it's for 350 L.L'. 'The new prices are no longer profitable for the agrarians, which forced them to stop growing wheat altogether'. 'Wheat mills are also not a common sight anymore'. The government has stopped taking the wheat in the past years. As for the pistachio's

growers, they mentioned that they couldn't compete with the imported pistachios, so their products weren't being sold anymore. Therefore, they switched to growing potatoes which was in high demand. One agrarian also stated that 'he tried to grow corn, yet the corn seeds were bad, and he had to switch to potatoes and onion crops.

Another agrarian who grows tomatoes and green peppers, represented himself as the 'Poor Farmer Raed'. He mentioned, 'that even though he is in debt to the agricultural pharmacy and the land owner, he will never leave agriculture; another agrarians stated that 'we are born in the land and we want to die here'. The market demand dictates what agrarians are growing in their fields. Growing fruits was common because there was a good market for fruits. Farmers used to grow grapes, figs, and blueberries. Now the only fruit grown is strawberries and lately they're grown in plastic houses.

Livestock production has declined in Khreibet El Jundi. Back in the 1950s and 60s, pastoralism was very common. They raised cattle, cows, and sheep. Many families considered pastoralism as their primary source of income, mainly from selling dairy products (milk, labneh, cheeses). Khreibet El Jundi has witnessed a major decline in livestock production and pastoralism because there was 'a loss of herding lands to private farms, young generation were engaged in urbanized activities, residents lost interest in raising livestock and consider it time consuming and a burden'. Currently, only 3 out of 73 full-time agrarians are raising cows and selling milk.

ii. 1960s agrarians who have diversified their livelihoods in 2018:

The number of residents with diversified livelihoods was 21 in the 1960s. 20 remained with diversified livelihoods and 1 has quit agriculture and became a non-

agrarian. This number has increased to reach 48 residents with diversified livelihoods in 2018.

The 21 out of the 106 full time agrarians in the 1960s opted to diversify their income generating activities in order to be self-insured against risks such as cold weather, storms, water pollution and climate change which affected their yields and agricultural revenue.

iii. 1960s agrarians who have transitioned away from agriculture

There are 15 participants who used to be full- time agrarians have quit the practice and transitioned away from agriculture. They have abandoned agriculture in search of other livelihoods capable of fulfilling their basic needs. Such cases include participants who have opened their own bakery, engaged in salaried jobs, working as handyman, or tractor drivers. These jobs have secured them a stable lifestyle, one which the agricultural business in Akkar can no longer support. Moreover, participants who are old in age have quit agriculture and rely on their children's help or remittances. As for the younger generation who are non-agrarians, they reported that while their parents were full-time agrarians, they are not interested in such a career since farming as a source of livelihood is very challenging nowadays due to the low profitability and tough labor required. Therefore, they are turning to other venues or relying on the military as a major source of employment.

Therefore:

- Most of the agrarians remained in agriculture. The transition was more towards diversified livelihoods and as opposed to quitting agriculture completely. Agriculture remains important as only 15 have completed their agrarian transition.

- It is evident that the majority have shifted to growing potatoes, tobacco, or green leafy vegetables in plastic houses (cucumbers, tomatoes, celery, eggplants, parsley, mint, okra, radish, cabbage).

- Pastoralism is not very common in Khreibet El Jundi. Currently, only 3 residents have cows.

b. Livelihood changes of the 1960s with diversified livelihoods:

21 participants had diversified livelihoods in the 1960s. Their agricultural income came mainly from selling wheat or pistachios or excess vegetables from their home gardens such as olive oil, kidney beans, green onions and tomatoes. Residents reported some diversification sources of their income including salaried jobs, mini markets, army, butchers, flower shop owner, shop rents, car painters, mechanics, mini-markets, coffee shop owner, private or taxi drivers, handymen, and shops rentals.

Those with diversified livelihoods in the 1960s remained diversified because most of them still have access to the land and consider agriculture as a cultural heritage that they should maintain to some extent.

- There was no transition from diversified livelihoods to off-farm livelihoods.

Among the 48 residents with diversified livelihoods in 2018, the proportion of earnings coming from agriculture was different. Some still consider agriculture as their main income source, accounting for half or most of the household's income. These include participants who grow potatoes, tobacco and green leafy vegetables (lettuce, spinach, tomatoes) in the Akkar coastal plain. On the other hand, others have diversified their income to a less extent, where they are only engaged in small agricultural activities

covering a minimal amount of their income (<25%) as shown in the table below. For example, a participant who was a full-time agrarian in the 1960s, used to grow pistachios for sale in the Tripoli market, explained that ‘he had to diversify his income in order to live’. He is working as a private driver and has olive crops and a big home garden; he sells olive oil, olives, and vegetables grown in his home garden. Other agrarians mentioned that they rely on their children remittances to survive. The first category also includes cases such as selling the excess of vegetables from their home gardens and selling ‘mouneh’ like pickles and shankleesh. Also, they sell olive oil where 1 tank of olive oil (20 L) is usually sold at 100\$. Yet, this year olive oil season was very bad. Olive growers claimed that they were able to sell only 3 olive oil tanks as opposed to the usual 12. This has further brought down the percent of agricultural income of the household.

Other diversification sources in 2018 include incomes from salaried jobs, working as a taxi or bus driver, joining the army, running a mini market, and renting shops.

Table 4: Categories of income earned from agriculture among respondents with diversified livelihoods in 2018 (n=48).

| % Agriculture income | 1-24% | 25%-50% | >50-99% | Total |
|---|--------------|----------------|-------------------|--------------|
| Residents with diversified livelihoods | 31 | 12 | 5 | 48 |

c. Livelihood changes of the 1960’s non-agrarians

The number of non-agrarians was 33 in the 1960s. Out of 33, 23 remained out of agriculture; these include people with different livelihoods such as: teacher, gardener,

and taxi driver. 7 have diversified their livelihoods; some seek their children's help, retirement income or rental's revenue along with their agricultural income. Finally, 3 non-agrarians who used to have salaried jobs in the 1960s have adopted agricultural livelihoods. They reported that their age, attachment to the environment, and access to land were the major reasons behind this shift.

- There was a transition from off-farm incomes to diversified incomes (21%) and to a less extent to farm incomes (9%). Most remained out of agriculture (70%).
- The number of non-agrarians has increased from 33 to 39 in 2018.

3. Current full agrarians in Akkar

Current full-time agrarians that were surveyed complained that the agriculture in Akkar is deteriorating. In the 1960s, agriculture was very profitable. Nowadays, agricultural revenue is not high; it's barely covering the production costs. They either earn a negligible profit or lose money on the harvest. Even the water they use for irrigation has worsened. The river water which fed the irrigation channels has become too polluted, contaminating the crops, and so they cannot use it anymore. One of the factors that is affecting profits is the fact that the majority of these farmers do not own the land that they are growing on. Most of them have an agreement with the land owner to use the field in exchange for a share of profit from the harvest yield, which cuts into their own income. Furthermore, agricultural inputs are expensive. The increasing costs of growing crops packaged with the bad weather they faced for several years either slashed their yields or completely halted them.

Moreover, most who work in the agrarian sector agree that agriculture is the most neglected sector at the moment. Yet, they claimed that they don't quit the field for many reasons. First, they inherited this trade from their grandparents. Agriculture was and will remain their only livelihood. "Farmers never dies poor". Second, they didn't go to school and this is the only skill they know and have to rely on it to make ends meet.

4. Drivers of agrarian transition

The agrarian transition happening in Khreibet El Jundi, which is manifested by livelihood diversification, is explained by multiple drivers. Based on interviews and personal observations, the main drivers behind the agrarian transition and livelihood changes happening in Khreibet El Jundi since the 1960s include:

- Lack of price control over the final products in the markets:

Agrarians reported that they've been facing major price falls in their products as compared to the 1960s.

- High production costs:

Agrarians stated that local prices are barely covering their production costs including seeds, fertilizers, pesticides, land rental, farming operations and irrigation.

For example, fertilizers are now sold at 600\$ compared to 400\$ in previous years, and potatoes seeds are sold at 1500\$ now, compared to 700\$ in previous years.

In addition, land rental price has been increasing in Akkar.

- Lack of state protection of local products against foreign competition, especially post-civil war:

Agrarians pointed out that they suffered from excessively low prices for their crops due foreign products from countries like Syria, Jordan and Egypt. For instance,

since the production cost is lower in these countries as compared to Lebanon, this has helped the foreign produce to sell at a lower cost. Pistachio growers have encountered this problem where they couldn't compete with foreign products. The prices of their crops have dropped to a point that it is not covering their production cost. This has pushed the agrarians to either quit agriculture or shift towards growing other crops.

- Government neglect for investing in agriculture also led to agrarian transition. This began after the civil war, where tourism and service investments were prioritized. Moreover, after the civil war, the government invested in urban infrastructure neglecting the rural areas where they suffered from shortage in post-harvest storage facilities, broken-down roadways, and deteriorated irrigation systems; all this has increased costs to farmers.

- Poor export market:

In the 1960s, before the Lebanese civil war, agrarians in Akkar used to export their goods to Syria, Jordan, and Saudi Arabia. For example, agrarians stated that they used to export potatoes to Saudi Arabia in trucks. Yet, trade and export were disrupted during the civil war.

- The decline in farmers ability to access capital:

High operation costs of small loans were increasing, and small-scale farmers were unable to afford it.

- The young generation lack of interest in agriculture. They moved out and engaged in urbanized economic activities and joined the army.

- Uncontrolled Urbanization in Akkar coastal plain. Construction is taking over the plain thus reducing agricultural land availability.

- The agricultural calendar is not being followed. For example:

Agriculture calendar states that during the months of February and March, potatoes can enter from Egypt.

On estimation, Lebanon consumes around 40,000-50,000-ton potatoes from first of February till end of March. Yet, they are allowing 100,000 tons to enter from Egypt. They stay in the market for long time and delay the Akkar season which will cause an overlap with the Beqaa season, which further reduces prices.

- Storms and cold weather:

Cold weather and storms affect agricultural yields. When ice covers the plants, it will destroy it. One possible way to reduce this is through drip irrigation. Yet, most of the farmers explained that they cannot afford it without governmental support.

- COOP corruption:

Agrarians stated that ‘the COOP gets funds to help agriculture in Akkar. Yet, they haven’t seen any major support’.

- Water pollution:

Irrigation channels are contaminated with sewage water and causing a lot of diseases and allergies. Agrarians are using well water for their home gardens and crops along with water from the Al-Estwan river.

- Climate change:

Elevated temperatures are increasing the risk of diseases and pests and reducing water availability.

B. Livelihoods disaggregation for gender, geographical location and home gardens

To examine, the association of gender, geographical location and home gardens with livelihoods, the data was disaggregated by these variables.

1. Livelihoods and Gender

In the sample studied, out of 160 residents, 76% are males head of households (HH) and 24% are females head of households.

Table 5: Gender of head of household and 2018 livelihoods (n=160).

| Gender | Agrarians | Diversified | Non-agrarians | Total* |
|-----------|-----------|-------------|---------------|--------|
| Female HH | 14 (19%) | 12 (25%) | 12 (30 %) | 38 |
| Male HH | 59 (81%) | 36 (75%) | 27 (70%) | 122 |
| Total | 73 (100%) | 48 (100%) | 39 (100%) | 160 |

*Gender of head of household and 2018 livelihoods were tested using χ^2 test
Pearson $Chi^2 = 1.9451$ Pr=0.378 ($P > 0.05$)

Regardless of gender, the highest proportions are the agrarians. Although proportions are similar, the actual work these individuals are practicing is gendered. Female HH rely on 'feminine' type of work along with agriculture. This includes running a flower shop, teaching, selling mouneh⁴, or seeking their children's financial support. As for males HH, they work as private or public drivers, engaged in army, work in salaried jobs, or other jobs like car painters, handy man, running a coffee shop or a mini-market. Yet, the association of gender with livelihood source is insignificant ($P < 0.05$).

⁴ Women in the village of Khreibet El Jundi are involved in the mouneh preparation. Mouneh is like food preservation and it ranges from fruit jams, to pickles, to molasses and shanklish. The village is very famous for its delicious shanklish, made from sheep or cow's milk and it's a very good source of protein. Mouneh is considered backup during hard times when the household faces a food shortage.

→ It is common to find female head of households in Khreibet El Jundi which often are widowed⁵ mothers. Their husbands have passed away either at a young age from the unhealthy lifestyle they adopt (reliance on energy dense food, high intake of sweetened beverages, smoking, physical inactivity) or they're old.

2. Livelihoods and geographical location

The village of KJ is divided into two zones: the coastal plain (zone 1) and the center of the village (zone 2). The higher proportion (55%) of our studied sample live in the center of the village as shown in table 6. For further analysis, livelihoods were disaggregated for geographical location.

Table 6: Shows geographical zoning of the village and 2018 livelihoods (n=160).

| Geographical location | Agrarians | Diversified | Non-agrarians | Total* |
|----------------------------------|------------------|--------------------|----------------------|---------------|
| Central Khreibet El Jundi | 10 (14%) | 45 (93%) | 33 (85%) | 88 (55%) |
| Akkar coastal plain | 63 (86%) | 3 (7%) | 6 (15%) | 72 (45%) |
| Total | 73 (100%) | 48 (100%) | 39 (100%) | 160 (100%) |

*Geographical location and 2018 livelihoods were tested using χ^2 test
 Pearson $\chi^2=93.2543$ Pr=0.000 ($P < 0.05$)

86 % of the agrarians live next to the coastal plain while 85% of the non-agrarians who don't have any agriculturally based livelihoods live in central Khreibet El Jundi. As for those with diversified livelihoods, they also tend to live in central Khreibet El Jundi (93%).

⁵ The prevalence of widowed woman is alarming in Khreibet El Jundi. Males are at a high risk of non-communicable diseases (NCDs), particularly cardiovascular diseases, as a result of morbid obesity. The village has witnessed the death of many residents in their early 40s because of NCDs. It is not common for women to get divorced in rural areas like Akkar.

→ This is because living next to the Akkar coastal plain is one of the main reasons that pushed agrarians to work and continue in agriculture. As for the non-agrarians they live in central Akkar next to their working domains like rented shops, mini markets, schools, etc. Same goes for those with diversified livelihoods.

3. Involvement in home gardens

Table 7: The prevalence of home garden among the three livelihoods (n=160).

| Home Garden | Agrarians | Diversified | Non-agrarians | Total* |
|---------------|-----------|-------------|---------------|------------|
| Yes HG | 40 (55%) | 40 (83%) | 24 (61.5%) | 104 (65%) |
| No HG | 33 (45%) | 8 (17%) | 15 (38.5%) | 104 (35%) |
| Total | 73 (100%) | 48 (100%) | 39 (100%) | 160 (100%) |

*Home gardens and 2018 livelihoods were tested using χ^2 test
 Pearson Chi2= 10.6390 Pr=0.005 (P <0.05)

Of the total study, 65% of residents have home gardens. Out of these, it is more common for those with diversified livelihood to have a home garden (P<0.05). This helps them to keep engaged in agricultural activities while working in other domains. Interestingly, female HH are more likely to have a home garden as shown in the table below (P<0.05).

Table 8: The prevalence of home garden per gender (n=160).

| | Male HH | Female HH | Total* |
|---------------|------------|-----------|-----------|
| Yes HG | 74 (61%) | 30 (79%) | 104 (65%) |
| No HG | 48 (39%) | 8 (21%) | 56 (35%) |
| Total | 122 (100%) | 38 (100%) | 160 |

*Home gardens and gender head of household were tested using χ^2 test
 Pearson chi2= 4.2613 Pr= 0.039 (P < 0.05)

→ This is because males usually go to work whether in agriculture or other livelihoods, so they don't have time to take care of the garden. Females are the ones who care the most about their children's health. They are more aware of the importance of clean water, and chemical free organic agriculture. They use well water since many irrigation channels are contaminated with sewage water. Also, females HH reported that home gardens help them reduce food expenditure

C. Food and Nutrition Security

To investigate the association of agrarian transition with food security and diet quality, two common indicators are used the food consumption score (FCS), and food insecurity experience scale (FIES). As for the expenditure module, it will be used to understand the association of livelihood diversification with food expenditure.

1. Food insecurity experience scale

a. Food security status among 2018 livelihoods

Table 9: Total FIES in the village (n=160).

| Variable | Obs | Mean | Std.Dev. | Min | Max |
|----------|-----|---------|----------|-----|-----|
| FIES | 160 | 3.48125 | 2.719535 | 0 | 8 |

The mean FIES in the studied sample was 3 with a minimum of 0 which are considered food secure and a maximum of 8 who are severely food insecure. Of the total HH, 55% were food secure and 45% experienced food insecurity based on global categorization (mentioned in the methodology).

Table 10: The prevalence of food insecurity among 2018 livelihoods (n=160).

| FIES | Agrarians | Diversified | Non-agrarians | Total* |
|--------------------------------------|------------------|--------------------|----------------------|---------------|
| I (food secure) | 24 (33%) | 31 (65%) | 33 (85%) | 88 (55%) |
| II (moderately food insecure) | 28 (38%) | 13 (27%) | 5 (13%) | 46 (29%) |
| III (severely food insecure) | 21 (29%) | 4 (8%) | 1 (2%) | 26 (16%) |
| Total | 73 (100%) | 48 (100%) | 39 (100%) | 160 (100%) |

*FIES and 2018 livelihoods were tested using χ^2 test

Pearson $\chi^2= 32.7336$

$Pr= 0.000$ ($P<0.005$ was considered to be statistically significant)

Chi square test shows that livelihoods have a significant association with FIES scores based on the global scales at alpha 0.05. This means that livelihood sources play a role in the food security of the household, with agrarians being the most vulnerable to severe and moderate food insecurity.

→ Full-time agrarians were highly prone to food insecurity. In fact, they have all reported low agricultural revenue. Even though the actual household income was not collected, based on the expenditure module (collected in %), it was clear that the agrarians have the lowest total income as compared to residents with diversified or off-farm income. Household income can impact food accessibility and therefore put the household at risk of food insecurity.

b. FIES and Home gardens in Khreibet El Jundi

Table 11: Food insecurity and home gardens (n=160).

| FIES | No HG | Yes HG | Total* |
|--------------------------------------|--------------|---------------|---------------|
| I (food secure) | 26 (46.5%) | 62 (60%) | 88 (55%) |
| II (moderately food insecure) | 18 (32%) | 28 (27%) | 46 (28.5%) |
| III (severely food insecure) | 12 (21.5%) | 14 (13%) | 26 (16.5%) |
| Total | 56 (100%) | 104 (100%) | 160 (100%) |

*FIES and home gardens were tested using χ^2 test

Pearson $\chi^2= 2.9176$ $Pr=0.223$ ($P>0.05$)

→ This is because they don't have livestock (cows, chickens) to provide them with nutrient dense food such as meat, eggs, and dairy products. They only grow vegetables which accounts for a minimal part of their daily food intake. They use vegetables for salad preparations, with breakfast, and in some meals. Most of their food and beverages are purchased from mini markets and butchers so income is the main determinant of household food security. Only 3 head of households out of 160 reported raising cows and chickens.

c. FIES and male vs female head of household

Table 12: Food insecurity by gender of head of household (n=160).

| FIES | Male HH | Female HH | Total |
|--------------------------------------|----------------|------------------|--------------|
| I (food secure) | 66 (55%) | 22 (58%) | 88 (55%) |
| II (moderately food insecure) | 35 (28%) | 11 (29%) | 46 (29%) |
| III (severely food insecure) | 21 (17%) | 5 (13%) | 26 (16%) |
| Total | 122 (100%) | 38 (100%) | 160 (100%) |

**FIES and gender were tested using χ^2 test
Pearson Chi2= 0.3698 Pr=0.831 (P>0.05)*

The mean FIES for females is 3.15 as compared to the males' mean of 3.58. There was no statistical significance at P-value of 0.05. This means that the gender of head of household does not affect food security.

d. FIES and geographical location

Table 13: Pearson chi2 test between geographical location and Global FIES (n=160).

| Location FIES | Central Khreibet El Jundi | Akkar coastal plain | Total* |
|--|--------------------------------------|--------------------------------|---------------|
| I (food secure) | 58 (66%) | 30 (42%) | 88 (55%) |
| II (moderately food insecure) | 23 (26%) | 23 (32%) | 46 (29%) |
| III (severely food insecure) | 7 (8%) | 19 (26%) | 26 (16%) |
| Total | 88 (100%) | 72 (100%) | 160 (100%) |

*FIES and geographical location were tested using χ^2 test

Pearson $\chi^2=12.9773$

$Pr=0.002 (P<0.05)$

→ This is because those who live in the Akkar coastal plain are mainly the agrarians who work in agriculture as their only livelihood. As shown in table 10, agrarians are the most vulnerable to food insecurity.

e. FIES and food expenditure

Table 14: Showing percentage spent on food and beverages among different livelihoods (n=160).

| 2018 livelihoods | % spent on food and beverages/month* |
|-------------------------|---|
| Diversified | 37.8125 |
| Full agrarians | 42.09589 |
| Non-agrarians | 44.558974 |
| Total | 41.41125 |

*FIES and food expenditure were tested using χ^2 test

Pearson $\chi^2(26) = 31.4703 Pr = 0.211 (P > 0.05)$

The non-agrarians spend the most on food and beverages which accounts for 44% of their total income/month as compared to 42% spent by the agrarians and 37% by those with diversified livelihoods.

→ This is because agrarians and people with diversified livelihoods save on food by relying on their own produced goods such as vegetables and potatoes. As for

the non-agrarians they must purchase all their food from super markets. It is important to note that usually food insecure people tend to spend a large share of their income on food. Based on the expenditure module⁶ reported by the participants, agrarians seemed to have the lowest income as compared to others; yet, it was found that they spend less on food than the non-agrarians who relatively have a higher income. Therefore, the estimate of food expenditure might not be very accurate.

f. FIES and food expenditure

A Chi2 was conducted between food expenditure and FIES. It showed no statistical significance where $P= 0.904 > P=0.05$. Therefore, the share of household spent on food has an insignificant association with food security.

i. Monthly food expenditure and FIES raw scores

A scatter plot is done to check the association between monthly food expenditure and FIES raw score. It shows a weak association supporting the results the Chi2 test.

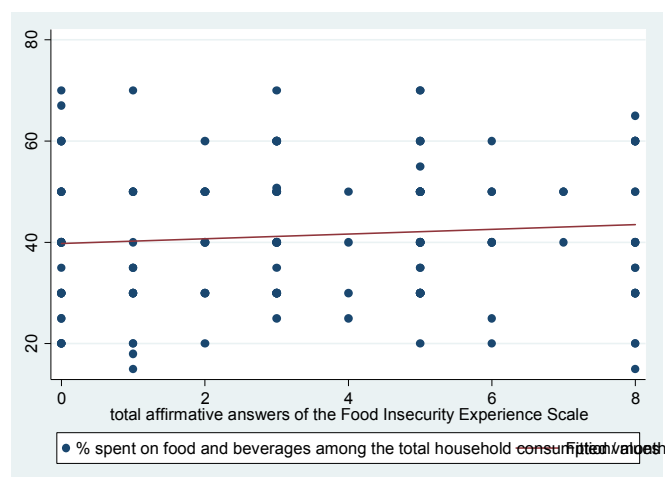


Figure 5: Scatter plot of total monthly food expenditure and FIES raw score.

⁶ The difference in household food expenditure will be explained in the discussion under section C, based on the Engel's law (Clements and Si 2017).

2. Food consumption score

a. Livelihoods and FCS

Table 15: Total FCS in the village (n=160).

| Variable | Obs | Mean | Std.Dev. | Min | Max |
|----------|-----|----------|----------|-----|-----|
| FCS | 160 | 66.05625 | 20.06906 | 20 | 107 |

The mean of food consumption score is 66 with a minimum of 20 and a maximum of 107. Three respondents had a poor FCS and they are full time agrarians. However, most of the sample studied (85%) had an acceptable FCS score⁷.

Table 16: FCS and 2018 livelihoods (n=160).

| Livelihoods \ FCS | Agrarians | Diversified | Non-Agrarians | Total* |
|-------------------------|-----------|-------------|---------------|--------|
| I (Poor) | 3 (4%) | 0 (0%) | 0 (0%) | 3 |
| II (Borderline) | 14 (19%) | 1 (2%) | 5 (13%) | 20 |
| III (Acceptable) | 56 (77%) | 47 (98%) | 34 (87%) | 137 |
| Total | 73 | 48 | 39 | 160 |

*FCS and 2018 livelihoods were tested using χ^2 test

Pearson $\chi^2 = 11.8849$

$Pr = 0.018$ ($P < 0.05$ was considered to be statistically significant)

- ➔ The three who have a poor FCS are agrarians who reported not consuming dairy, meat, fish, chicken, eggs on a weekly basis because they cannot afford it. When they run out of food, they rely on mouneh like pickles, olives and olive oil.
- ➔ It is true that the agrarians work in agriculture and this must enhance the HH food availability. However, they only grow potatoes and tobacco. Therefore, they cannot rely on their crops for home consumption except for potatoes. In

⁷ FCS cut-off points as mentioned in the methodology are the following: 0-28 (poor/category I), 28.5-42 (borderline/category II) and > 42.5 (acceptable/category III) (VaSyr 2017). The higher FCS score reflects better diet diversity and quality.

addition, those who have a home garden only grow vegetables which have a low nutritional weight.

- They cannot afford consuming meat, poultry, dairy and fish on a weekly basis (the highest nutritional weight). They try to compensate by consuming beans like kidney beans and chickpeas.
- They consume sugar and tea on a daily basis as an energy source; however this does not have any nutritional value. Bread and potatoes are consumed daily and sometimes twice a day.
- Non-agrarians and diversified livelihoods have better diet quality and diversity because they can afford it.
- It is important to mention that FCS tackles dietary patterns over the past week whereas FIES studies the previous year. This explains the difference in obtained results with a majority having an acceptable FCS.

i. Livelihoods and meat consumption

Table 17: Frequency of weekly meat consumption among different livelihoods (n=160).

| Meat consumption/week | Agrarians | Diversified | Non-agrarians | Total* |
|-------------------------------|------------------|--------------------|----------------------|---------------|
| Never consumed | 32 (44%) | 5 (10%) | 0 (0%) | 37 |
| Consumed 1 to 6 a week | 39 (53%) | 36 (75%) | 33 (85%) | 108 |
| Daily consumption | 2 (3%) | 7 (15%) | 6 (15%) | 15 |
| Total | 73 | 48 | 39 | 160 |

*Frequency of meat consumption and livelihoods were tested using χ^2 test
 Pearson Chi2= 47.3330 Pr=0.000 (P < 0.05)

This table shows that 44% of the agrarians don't eat meat on a weekly basis as compared to 10 % of those with diversified livelihoods and none of the non-agrarians. The majority consume meat 1-6 times a week.

→ One of the agrarians who cannot afford buying meat reported that 'he has a cow; he gives the milk to the butcher and take meat in return'. 32 of those who don't consume meat on a weekly basis reported consuming it once or twice a month because they cannot afford it. They love to eat meat so much so they feel they are deprived from it but there is not much they can do. The chi2 test was done and has shown that livelihoods have a significant association with frequency of meat consumption at alpha 0.05.

ii. Livelihoods and fruits consumption

Table 18: Frequency of weekly fruits' consumption among different livelihoods (n=160).

| Fruit consumption/week | Agrarians | Diversified | Non-agrarians | Total* |
|-------------------------------------|------------------|--------------------|----------------------|---------------|
| Consumed 0 to 6 times a week | 58 (79.5%) | 32 (67%) | 26 (67%) | 116 (72.5%) |
| Consumed daily | 15 (20.5%) | 16 (33%) | 13 (33%) | 44 (27.5%) |
| Total | 73 (100%) | 48 (100%) | 39 (100%) | 160 (100%) |

**Frequency of fruit consumption and livelihoods were tested using χ^2 test
Pearson Chi2= 3.2545 Pr=0.196 (P >0.05)*

This table shows that 72.5 % of the sample studied don't consume fruits daily and 27.5% consume it daily. Chi square test shows that there is no significant association of livelihoods with the frequency of fruit consumption at P-value of 0.05.

→ As reported, fruits consumption is not very common for many reasons: they buy fruits only when they can afford it, they don't grow fruits in their home garden, and they don't grow fruits in Akkar coastal plain for selling except for some

strawberries. Some reported that daily fruit consumption is not important, they'd rather spend the money on something else.

iii. Livelihoods and vegetables consumption

Table 19: Frequency of weekly vegetables' consumption among different livelihoods (n=160).

| Vegetables consumption/week | Agrarians | Diversified | Non-agrarians | Total |
|------------------------------|-----------|-------------|---------------|-------------|
| Consumed 0 to 6 times a week | 13 (18%) | 5 (10.5%) | 10 (25%) | 28 (17.5%) |
| Consumed daily | 60 (82%) | 43 (89.5%) | 29 (75%) | 132 (82.5%) |
| Total | 73 (100%) | 48 (100%) | 39 (100%) | 160 (100%) |

*Frequency of fruit consumption and livelihoods were tested using χ^2 test
 Pearson $Chi^2= 8.0551$ Pr=0.428 ($P > 0.05$)

This table shows that most households regardless of livelihoods consume vegetables daily (82.5%) and 17.5% consume vegetables less than 7 times a week. Yet, there is no statistical significance between the frequency of vegetables consumed per week and different livelihoods.

➔ Most of them have home gardens where they grow vegetables or grow vegetables for sale. Even if residents don't grow their own vegetables, receiving gifts from their neighbors or siblings is very common in the village.

b. FCS and home gardens in Khreibet El Jundi

Table 20: FCS and home gardens (n=160).

| FCS categories | No HG | Yes HG | Total* |
|-------------------------|-----------|------------|-------------|
| I (Poor) | 1 (2%) | 2 (2%) | 3 (2%) |
| II (Borderline) | 7 (12.5%) | 13 (12.5%) | 20 (12.5) |
| III (Acceptable) | 48 (85.5) | 89 (85.5%) | 137 (85.5%) |
| Total | 56 (100%) | 104 (100%) | 160 (100%)s |

*FCS and home gardens were tested using χ^2 test
 Pearson $Chi^2= 0.0037$ Pr=0.998 ($P > 0.05$)

This table shows that residents who have home gardens tend to have higher FCS as compared to those who don't. Yet, the chi square test shows that the home garden has no significant association with Food consumption scores at P-value of 0.05. This means that having a home garden does not affect the food and nutrition security of the household.

→ Mainly because what they grow in home gardens is vegetables which have a low nutritional weight as compared to meat and dairy. And as they stated, what they worry about when financially unstable is purchasing meat/poultry/fish, dairy and fruits.

i. Home gardens and fruits consumption

Table 21: The frequency of fruits consumed (days/week) and home gardens (n=160).

| Home Garden | Fruits consumed 0-6 times a week | Fruits consumed daily | Total* |
|--------------|-------------------------------------|--------------------------|------------|
| No | 45 (39%) | 11 (25%) | 56 (35%) |
| Yes | 71 (61%) | 33 (75%) | 104 (65%) |
| Total | 116 (100%) | 44 (100%) | 160 (100%) |

*Frequency of fruit consumption and home gardens were tested using χ^2 test
 Pearson $\chi^2 = 2.6677$ $Pr=0.102$ ($P > 0.05$).

The majority (75%) of those who possess a home garden tend to consume fruits daily. Yet, the association of home gardens with fruits consumption was not statistically significant.

ii. Home gardens and vegetables consumption

Table 22: The frequency of vegetables consumed (days/week) and home gardens (n=160).

| Home Garden | Vegetables consumed 1 to 6 times a week | Vegetable consumed daily | Total* |
|--------------|---|--------------------------|------------|
| No | 14 (50%) | 42 (32%) | 56 (35%) |
| Yes | 14 (50%) | 90 (68%) | 104 (65%) |
| Total | 28 (100%) | 132 (100%) | 160 (100%) |

*Frequency of vegetables consumption and home gardens were tested using χ^2 test
 Pearson $\chi^2 = 4.8345$ $Pr=0.305$ ($P > 0.05$)

This table shows that those who have home garden tend to consume vegetables on a daily basis (68%) as compared to those who don't have a home garden (32%). However, the association of home gardens with weekly vegetable consumption was insignificant.

c. FCS and Gender head of household

Table 23: FCS and gender (n=160).

| FCS categories | Male HH | Female HH | Total* |
|-------------------------|------------|-----------|-------------|
| I (Poor) | 2 (2%) | 1 (3%) | 3 (2%) |
| II (Borderline) | 16 (13%) | 4 (10%) | 20 (12.5%) |
| III (Acceptable) | 104 (85%) | 33 (87%) | 137 (85.5%) |
| Total | 122 (100%) | 38 (100%) | 160 (100%) |

*FCS and gender were tested using χ^2 test.
 Pearson $\chi^2 = 0.3161$ $Pr=0.854$ ($P > 0.05$)

The mean FCS of females headed households is 67.94 as compared to the mean of males' head of households which is 65.47. Those with an acceptable food consumption score accounts for 85.5% of both males and females. Yet, the gender of the head of household had no significant association with household FCS.

d. FCS and Geographical location

Table 24: FCS and geographical location (n=160).

| Location FCS | Central Khreibet El Jundi | Akkar coastal plain | Total* |
|-------------------------------|--------------------------------------|--------------------------------|---------------|
| I (Poor) | 0 (0%) | 3 (4%) | 3 |
| II (Borderline) | 7 (8%) | 13 (18%) | 20 |
| III (Acceptable) | 81 (92%) | 56 (78%) | 137 |
| Total | 88 (100%) | 72 (100%) | 160 |

*FCS and gender were tested using χ^2 test.

Pearson $\chi^2=7.8404$

$Pr=0.020$ ($P < 0.05$)

Chi square test shows that geographical location has a significant association with FCS score at alpha 0.05. 4% of those who live in coastal Akkar plain have a poor FCS as compared to 0% of those living in central Khreibet El Jundi. Moreover, 92% of those who live in central Akkar have an acceptable FCS as compared to 78% in central Khreibet El Jundi.

- ➔ Again, this is because those who live in the Akkar coastal plain and rely on agriculture as their only livelihood are most vulnerable to food insecurity.
- ➔ The three head of households who live in coastal Akkar and have a poor FCS happen to be agrarians, they reported 0 consumption of dairy and meat on a weekly basis.

e. FCS and food expenditure

Food expenditure has a significant association with FCS score with P-value of 0.03 (<0.05) and a negative coefficient (-0.2). This means that a decrease in HH food expenditure⁸ can significantly increase FCS and therefore Food security.

f. Paired food consumption score and food insecurity experience scale

Both indicators of food and nutrition security were tested against each other. A scatter plot was done; it showed that those who have higher FCS scores tend to have lower FIES raw scores. A regression test was carried out to check if this association is significant.

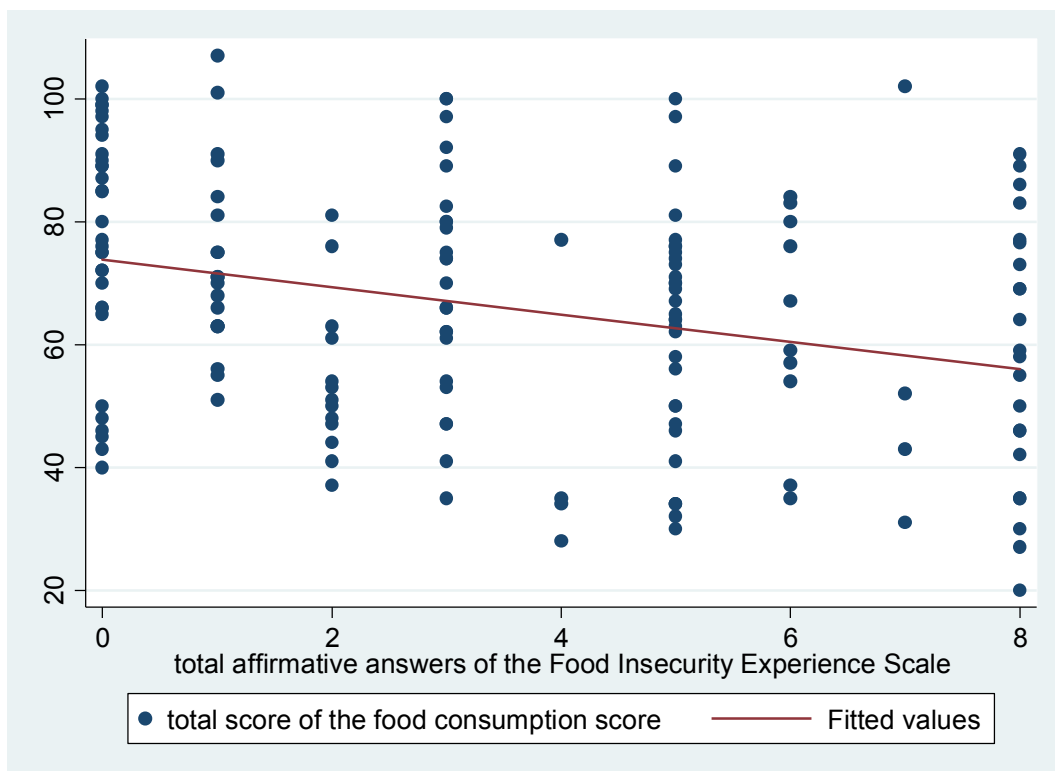


Figure 6: Scatter plot FCS and FIES.

⁸ The relationship between income and household food expenditure will be explained in the discussion under section C, based on the Engel's law (Clements and Si 2017).

Table 25: Regression between the total scores of FCS and FIES raw score (n=160).

| Source | SS | df | MS | Number of Obs = 160 F (1, 158) = 15.82 Prob > F=0.0001 R-squared = 0.0910 Adj R-squared=0.0852 Root MSE=19.195 |
|----------|------------|-----|------------|---|
| Model | 5827.6941 | 1 | 5827.6941 | |
| Residual | 58212.2997 | 158 | 368.432276 | |
| Total | 64039.9938 | 159 | 402.767256 | |

| FCS | Coef | Std.Err | T | P> t | [95% Conf. Interval] |
|------|-----------|----------|-------|-------|----------------------|
| FIES | -2.226153 | 0.559739 | -3.98 | 0.000 | -3.33169 -1.120617 |
| | 73.80605 | 2.469759 | 29.88 | 0.000 | 68.92805 78.68405 |

The test shows that there is a significant association between FCS and FIES raw score at 95% CI internal with P-value of 0.0001 (<0.05) and a negative coefficient (-2.2). This means that a decrease in FIES raw score can significantly increase FCS.

As expected, those who are food secure tend to have higher FCS score which reflects higher diet quality and diversity.

CHAPTER V

DISCUSSION

A. Agrarian Transition

Khreibet El Jundi has witnessed an agrarian transition, manifested by a decline in the percentage of agrarians from 66% to 45% since the 1960s. Agrarians chose to move away from agriculture and transition to an economically sustainable livelihood, able to provide their families with better living conditions like enhanced educational opportunities and medical services.

The results of this research project are aligned with the results of the same project carried out in other Lebanese villages: Nabha (Baalback) and Batloun (Chouf). Amhaz (2019) found that the proportion of full-time agrarians has decreased from 37% in the 1960 to 7% in 2018. The author mentioned that water pollution is among the factors contributing to the agrarian transition in Nabha. Likewise, Weber (2018) demonstrated that the number of full-time agrarians in Batloun has decreased by four folds. 8 % of the studied population were full time agrarians and mainly grow apples in the 1990, this number decreased to reach 2% in 2018. The major factors are low agricultural profit and lack of markets to sell their products which has pushed them to shift away from agriculture. (Weber 2018).

The study in Khreibet El Jundi shows that the most adopted mitigation strategy in the village is livelihood diversification. Livelihood diversification is found through engaging off-farm activities along with commercial agricultural activities like growing potatoes; or farmers tend to sell a greater proportion of their home gardens goods rather

than keeping it for own consumption. Yet, migration as a mitigation strategy is not common in Khreibet El Jundi, as residents who seek better job opportunities work in Tripoli or even in Beirut but still reside in the village. However, results were different in Nabha and Batloun when the same study was carried out. In Nabha, interviewees with diversified livelihoods have decreased between 1960 and 2018 from 25% to 12%. Water shortage and climate change were major contributors to the agrarian transition in Nabha (Amhaz 2018). The same goes for Batloun, the proportion of residents with diversified livelihoods has decreased from 31 % in 1990 to 18 % in 2018; they have transitioned completely away from agriculture.

As for the non-agrarians engaged in off-farm incomes, the results were similar in the three villages. Migrating away from agriculture was common in all villages; however, the bulk of the samples in Nabha and Batloun were the non-agrarians, as for Khreibet El Jundi, non-agrarians were the smallest proportion of the studied sample. Non-farm activities are all kinds of non-agricultural income generating activities adopted by rural families. These activities include: waged work, self-employment, handicrafts, wage daily labour, and joining the public service as teachers (Davis 2003). The non-agrarians in Khreibet El Jundi who have transitioned away from agriculture, have engaged mainly in the army. In fact, military enlistment is positively linked with low socio-economic status. Akkar, which is the poorest area in Lebanon, is a major supplier of foot soldiers. During 2006-2013, 39% of LAF soldier recruits originated from Akkar. (Yassin and El Solh 2017). Residents in Khreibet El Jundi are attracted to army for many reasons including steady salary, health insurance, and free schooling of children. Participants in Nabha and Batloun reported exiting agriculture completely and relying on off-farm income to have better financial capacity and sustain a proper living

(Amhaz 2019; Weber 2018). In Nahba, the main problem was water shortage which has pushed agrarians away from agriculture (Amhaz 2019). Likewise, in Batloun, the drivers of agrarian transition include 1) the conflict in Syria affecting the export of Lebanese products to their market thus reducing their profit 2) aging population are the ones residing in the village and the new generation is seeking non-agrarian livelihoods (Weber 2018).

The agrarian transition in the Lebanese villages fits the Global and Arab trends. In fact, Jordan, Iraq and Egypt have also undergone an agrarian transition, with different drivers behind it. Climate change, urbanization, water shortage and government's interest in other sectors, are the main contributors to the agrarian transition in the Arab world (Belloumi and Matoussi 2009; Woertz 2017; Ayeb and bush 2014).

Globally, many countries have undergone an agrarian transformation. The extent of agrarian transition differs from developing to developed countries. Indonesia, India and Pakistan have witnessed a decline in agricultural productivity leading to a decrease in the agriculture contribution to the national GDP (Lerche 2011; Zulgani et al. 2018; Nasir et al. 2018).

B. Livelihoods disaggregation for gender, geographical location and home gardens

Agriculture was the main source of livelihood among both genders. A study done by Abi chebel (2004) in Akkar showed that Lebanese women play an important role in family farms although she suffers from discrimination. The same results are found in a study in Syria. Galie et al. (2013) points out that women play a crucial role in farming in Syria; they are highly involved in agricultural management. Yet, they are undervalued where men consider them as 'helpers' rather than farmers.

Residents of Khreibet El Jundi consider agriculture as their cultural heritage which they inherited from their grandparents. Old agrarians reported that they have an endless attachment to the land; they feel safe around it and secure. That is why residents' involvement in home garden next to their house was very high. They care about eating clean organic food without added chemicals and irrigated with clean water (well water). Some also believes that it helps in saving money on food. Old agrarians reported that in the past, they used to rely on their crops and home gardens that used to cover almost 90% of their home consumption. They stated that they rarely bought goods from the mini-market. However, 2018 agrarians revealed that their home garden and crops only cover a small amount of their household's consumption. This is because they only grow vegetables at home that they use to make salads like mint, lettuce, pesto, cucumbers, tomatoes and parsley. Only few reported growing fruits like peaches, figs and oranges. Interestingly, results have shown that women headed household are more likely to have a home garden. In fact, they are the ones who care the most about their children's health and therefore care about feeding them organic vegetables irrigated with clean water. Likewise, home gardens were the responsibility of women in Tanzania (Pillai et al. 2016). Women reported that home garden is an old agricultural practice that eases food access since it is right next to their homes. They also consider home garden as a mean of reducing food expenditure and an added source of income (Pillai et al. 2016).

Similarly, the high involvement in home gardens was noticed in Nabha and Batoun. The main motivators behind home gardens in Nabha are, better tasting fruits, healthy fruits. They mainly grow fruits like figs, grapes and pomegrennate for mouneh.

In Batloun, the bulk of the sample own a home garden. The purpose of home gardens is for home and/or commercial production. The main motivation behind home gardens in Batloun is to grow chemical-free food. They complained about the uncontrollable use of fertilizers and chemicals in fruits and vegetables. Also, home gardens support their attachment to the land (Weber 2018).

There are several reasons why home gardens are very common in the Lebanese rural areas. Although they might not contribute to the household income, they do reduce the food expenditure expense that the family has since they grow their own personal fruits and vegetables (Batal et al. 2007; Hunter 2008).

Furthermore, the agrarian residents in the three villages are motivated by the quality of food which they produce on their own. They do not tend to use chemicals in their home gardens in order to have fresh and organic food of high quality. They also use different irrigation techniques and not the contaminated river water. Others have an emotional attachment to their home garden fueled by their love of the land and the responsibility they feel towards it and their family's culture. Not all types of fruits and vegetables are grown in home gardens. For example, in Nabha, fruits are the main crops grown were figs, pomegranate, and grapes. They can use the fruits for a variety of meals and "mouneh" to create jams that they can save for later seasons. It is agreed that a fruit consumed directly from the tree are tastier and fresher than the ones found in the markets. Yet, unlike Khreibet El Jundi, they don't grow vegetables because of water scarcity (Amhaz 2019). Vegetables are very common in Khreibet El Jundi as a result of the dry climate and sandy soil. in home gardens as fruit. As for Batloun, the main grown crops in home gardens are the apples. In fact, this area has always been famous for its apple cultivation (Weber 2018). Home gardens can increase household income thus

improve its livelihood. Additionally, it can play a role in poverty reduction and rural development (Galhena et al. 2013).

Pastoralism is practiced by most of the agrarians in Nabha. Yet, this practice has almost disappeared in Batloun and Khreibet El Jundi.

C. Food and Nutrition Security

Food insecurity was high in Khreibet El Jundi, with 45% of the studied sample being moderately or severely food insecure. Livelihood diversification has a significant association with food security and diet quality in Khreibet El Jundi; the full-time agrarians are those facing food insecurity and poor diet quality the most. Residents relying on other sources of income generating activities along with agriculture showed to be more food secure as compared to those relying solely on agriculture. This is because income is what shapes household ability in purchasing food and agricultural based livelihoods are with the lowest revenue. Food-insecure adults may consume a higher amount of palatable foods as a surviving mechanism, resulting in poorer diet quality (Leterme and Muuoz 2002). Food insecurity in terms of access, results in a poor diet quality since the nutrient-dense foods such as fruits and vegetables are more expensive when compared with energy- dense processed food which are usually high in fat and added sugars (Leung et al. 2014). Therefore, rising agricultural earnings helps households to enhance their consumption of higher value foods (Evans and Ngau 1991). These findings were supported by two studies done in Konduga, Nigeria and in Kilifi, Kenya; where results have shown that off-farm incomes increase household income therefore contributes to better nutrition and food security status since healthy nutritious foods are more expensive (Dedehouanou and Mcpeak 2019; Evans and Ngau 2000).

Likewise, In Nabha (Amhaz 2019), food insecurity was relatively high and it happened to be the highest among the agrarians. As for food diversity measured using FCS, most of the studied sample in the three villages had an acceptable FCS. Residents reported that there has been times where they think they ate less than they should. During such hard times, they rely on mounch which is available all year long including shanklish, kishk , fruit in the form of jams, pickles, and olives.

Yet, these findings don't align with the case of rural Bedouins in Lebanon. In fact, diversifying their livelihoods and migrating away from food production- based activities had a significant negative association with household food security and diet quality of the rural Bedouins in Lebanon (Ghattas et al. 2013). This is because the study was done after the increase in food crisis. Increase in food prices put the Bedouins at risk of food insecurity since they rely on their income to purchase food from the market.

Food insecurity findings were consistent when food and nutrition security studies were carried out in Lebanon using different indices. For instance, IFPRI reported that Lebanon is prone to moderate food and nutrition security, based on three different national assessments (Hwalla et al. 2016). Furthermore, the AFFSS found that 42% of the Lebanese citizens residing in the South suffered from food and nutrition insecurities as well as 62% of the Palestinian refugees living in Lebanon (Sahyoun et al. 2014). Such alarming levels were supported by results found from the HFIAS in the Bekaa valley, showing that 52% of Lebanese households there were food and nutrition insecure (Naja et al. 2015).

The diet quality in Khreibet El Jundi is interesting, where residents reported relying on cereals like bread and potatoes as their main source of energy; animal protein sources and dairy products contributed to a very minimal part of their weekly intake as

they cannot afford it. Ironically, the diet adopted by residents of Khreibet El Jundi is similar in some points to the healthy diet recently launched by the Eat Lancet Commission, where they stated that cereals should be the main source of energy and dairy foods along with animal protein sources should be reduced (Willet et al. 2019).

The findings regarding the diet quality in the village of Khreibet El Jundi are aligned with studies done in rural Lebanon. Hwalla (2000) reported that the average energy intake of people in rural Lebanon is 2300 kcal/day where half comes from cereals like bread and rice. Another study was carried out by Hwalla (2000) on 25 families in Mountain Lebanon where the results of the 24-hour recall found that cereals were the major source of energy and consumption of animal products like meat were low. Moreover, legumes such as kidney beans, chick peas, and lentils are staple items and their consumption remained higher in rural areas as compared to urban ones. These findings were supported by Leterme and Muuoz (2002), where they found that rural people eat more locally produced pulses than the urban population; ‘beans are still the poor man's meat’.

Out of the studied sample in the village of Khreibet El Jundi, the non-agraians, who are not engaged in any agricultural activities, were found to spend the most on food; followed by the agrarians and those with diversified livelihoods, respectively. One of the study’s limitation is that the total household income was not collected, and this is because participants preferred not to share it. They filled the expenditure module by giving each category an estimate percentage of its share of the total income; for example, food expenditure accounts for 40% of the total household income. Engel’s law declares that “as income rises, the proportion of income spent on food falls” (Clements and Si 2017). This law was evident when comparing the agrarians with those with

diversified livelihoods. For instance, residents with diversified have higher incomes and the share of their income spent on food was lower. However, this law was not supported when comparing the non-agrarians with the agrarians. Even though the non-agrarians spent the most on food, it was clear from the expenditure module that they have a higher income. Non-agrarians were capable of spending on many items other than food and health such as amusement, clothing and footwear. Yet, the agrarians reported that their income was only enough to spend it on household necessities such as health, food and beverages and education.

Finally, the highest rate of food and nutrition insecurity in the village was attributed to households with heads working in agriculture. Unfortunately, most of the food insecure populations live and work in the areas where food is being produced (Borras Jr 2009).

CHAPTER VI

CONCLUSION AND RECOMMENDATIONS

A. Conclusion

This research shows that the agrarian transition was significant in Khreibet El Jundi. Yet, agriculture remains an important rural livelihood as Akkar is the second major agricultural area in Lebanon. Food and nutrition security status was significantly different among the three adopted livelihoods in 2018 (Agrarians, diversified, and non-agrarians).

Agrarian transition, manifested by livelihood diversification and abandoning agricultural activities, was detected in Khreibet El Jundi. In fact, the proportion of full-time agrarians has decreased from 66% in the 1960s down to 45 % in 2018. Yet, the numbers of residents relying on diversified livelihoods or off-farm livelihoods has increased. Residents reported that the main reasons behind livelihood diversification or quitting agriculture is the low agricultural revenue and the damage the Lebanese civil war has left on the practice. This village was famous for wheat and pistachios crops, however, potatoes and tobacco are the present dominant crops.

Eventhough residents relying on farming as an income solely has decreased, the residents of Khreibet El Jundi still have an endless attachment to the land. This was seen by the high prevalence (65%) of home gardens among the studied sample with significant greater involvement of female headed households. Female head of households, were interested in home gardens for safety purposes and for feeding their children organic vegetables irrigated with clean water. As for male headed households,

considered home gardens as a cultural heritage. The association of home gardens with household food and nutrition security was not significant.

The proportion of female head of households accounted for 24% of our studied sample as compared to 76% male head of households. Likewise, the hypothesis that the gender of the head of household has an association with household food and nutrition security was rejected.

As for the geographical distribution of residents, agrarians tend to live by the coastal plain next to their crops whereas residents with diversified livelihoods and non-agrarians prefer to live in the central part of Khreibet El Jundi, next to their off-farm jobs like mini-markets or commercial shops. Our hypothesis that geographical location enhances household food and nutrition security was accepted, where residents living in the coastal plain experienced significant higher levels of food insecurity as compared to those living in the center of the village.

Food and nutrition insecurity measured by FIES and FCS, was evident in the studied village. Interviews with moderate food insecurity represented 29% of the studied sample followed by 16% with severe food insecurity; based on the global categorization of food insecurity. Furthermore, FIES was studied among the three different livelihoods, and agrarians were the most vulnerable to moderate and severe food insecurity, followed by residents with diversified livelihood and non-agrarians respectively. Current adopted livelihoods had a significant association with diet diversity. The FCS showed that the majority of the sample (85%) had an acceptable food consumption. The score reflects diet diversity among interviewed villagers. This diversity is met by daily vegetables' consumption from home gardens, consumption of plant-based protein like lentils and beans and the high consumption of shanklish

(protein dense mouneh). Furthermore, only three full-time agrarians had a poor food consumption and they were the highest proportion with borderline FCS, as compared to residents with diversified or off-farm incomes. This is explained by very low or even lack of meat and fish consumption in their diets.

As for the share of income that households were spending on food and beverages, the highest percentage was among the non-agrarians, followed by the full agrarians and diversified livelihoods respectively. Yet, this difference was not statistically insignificant. One of the main study limitations, is the recall bias when addressing the expenditure module. Therefore, the share of income spent on food might not be very accurate.

To conclude, agrarian transition and livelihood diversification had a significant association with household food and nutrition security (diet quality) of Khreibet El Jundi residents. Food producers, the full-time agrarians, reported very low agricultural revenue; they were the most vulnerable to food insecurity and low dietary diversity. At the end, increase in household income enhances food affordability and is an important contributor to household food and nutrition security (Headey and Masters 2019).

B. Recommendations

This study aimed at understanding the agrarian transition and livelihoods' evolution in the least developed area in Lebanon, Khreibet El Jundi located in Akkar, since the 1960s. This area has always relied on agriculture as a primary source of income. However, the civil war and other factors have pushed farmers away from agriculture. Since the majority of the interviews complained about the same problems they're facing in the agricultural sector, in-depth studies would be helpful to understand

these causes and work on possible solutions that could be implemented to limit this agrarian transition and encourage those who have either diversified their livelihoods or quit agriculture to reconsider investing and working in this as Akkar has always been an agricultural hub and has the potential to return to its former production.

These solutions could include:

- Training and educating farmers on export market, packaging and labeling to improve agricultural revenue.
- Increasing farmers' access to technological improvements.
- Encouraging involvement in home gardens.
- Encouraging livestock production like cows and chickens for dairy products and eggs.
- Focus on agrarians when addressing food and nutrition security issues.
- Support agrarians as a form of social welfare.

Years of neglect have left the agricultural sector in a dire situation. That is why it is going to take the collective efforts of several, if not all, coalitions of society in order to restore the profitability and productivity of the agrarian livelihood. Government intervention is necessary, through favorable regulations that will benefit and support the farmer. More importantly, the government needs to work to protect these skilled laborers from the external factors that are affecting them, such as open markets, capitalism, smuggling, and underdevelopment.

Aside from the direct intervention needed, there needs to be an educational decree aimed at the farmers themselves. Many of the inhabitants of Khreibet El Jundi have little to no access to the technological improvements or business know-how that many in the urban areas take for granted. These basic skills can make a difference by

teaching the farmer his or her rights, by learning the best techniques and systems to create a profitable agricultural system, and by providing alternative income sources without having to forgo their heritage or finding themselves under skilled in new labor markets.

The agrarian community, not only in Akkar but all over Lebanon, needs to be restructured with the well-being of the agrarians themselves being placed as a top priority. This way, the new regulations and plans will help sustain the agrarian lifestyle for years to come, and make it more resistant to external negative stigma, thus giving the agrarian a fighting chance to display their importance to the well-being and health of the Lebanese economy as a whole.

To understand more the association of livelihood changes with food security and diet quality, a 24-hour recall could be helpful in further studies. Moreover, including household size in the questionnaires would be interesting to investigate the association between household size and food and nutrition security. A larger sample size would be crucial to study multivariate analysis and understand the association between the different variables. Finally, collecting household total monthly income would be beneficial to look at the association between total income and household food and nutrition security.

APPENDIX I
QUESTIONNAIRE (ENGLISH)

2018 versus 1960

Name?

For our filing purposes only- name will not be used in any public discussion or publication that results from this research. All of your answers are completely confidential and will remain so, this paper and survey materials will be destroyed at the completion of this research at the end of the August.

1. In the past 12 months, what were your sources of income? Do you have income from agriculture?

Thinking back to the time around the 1960s?

What were your main income sources? Did you have income from agriculture?

2. What type of agriculture do you currently practice?

What is your cropping system? What do you grow/harvest/raise?

And thinking back to the time around the 1960s?

What type of agriculture did you practice?

3. How much of your income do you think comes from agricultural annually?

(considering seasons individually/ looking back at the past 12 months)

Would you say that none of your income, only a little but (*minimal*), around half, mostly (*but there are other income sources*), or all of your income income is from agriculture?

And around the 1960s?

How much of your income do you think came from agricultural annually?

4. What are the most important crops that you grow for your household's consumption?

And around the 1960s?

What were the most important crops that you grew for your household's consumption?

5. What are the most important crops you grow for sale?

And around the 1960s?

What were the most important crops you grew for sale?

6. What percentage of what you eat, seasonally, comes from your land?

Would you say that none of what you eat comes from your land, only a little (*minimal*), around half, mostly (*but there are other sources*), or all of your food comes from agriculture?

This includes from crops that produce for sale but also eat, crops you grow only for your household to eat from a garden or from fields, foods and herbs you grow in a small garden

And around the 1960s?

What percentage of what you consumed, annually, do you think came from your land?

7. What are your current motivations for farming/ having a garden?

(for income? to save on food expenditures? to help the environment?)

And around the 1960s?

What motivated you to keep a garden?

8) Do you consider agriculture/your garden as a way to reduce your household food expenditures?

And around the 1960s?

APPENDIX II

FOOD CONSUMPTION SCORE FORM (ARABIC AND ENGLISH)

| | |
|--|--|
| <p>How many days over the last 7 days, did members of your household eat the following food items, prepared and/or consumed at home, and what was their source?</p> | <p>كم يوم في خلال السبعة ايام الماضية تناولت فيه عائلتك الأطعمة التالية</p> |
| <p>1. How many days over the last 7 days, did members of your household eat: Tubers (potatoes) and Cereals (bread, rice, pasta, wheat, bulgur, other cereals)</p> | <p>1. الدرنيات (البطاطس) والنشويات، : الخبز، المعكرونة، الأرز، الذرة، القمح، البرغل، الفريكة</p> |
| <p>2. How many days over the last 7 days, did members of your household eat: Cereals (bread, rice, pasta, wheat, bulgur, other cereals)</p> | <p>2. النشويات: الخبز، المعكرونة، الأرز، الذرة، القمح، البرغل، الفريكة</p> |
| <p>3. How many days over the last 7 days, did members of your household eat: Roots and Tubers (potatoes)</p> | <p>3. الدرنيات (البطاطس)</p> |
| <p>4. How many days over the last 7 days, did members of your household eat: Legumes / nuts : beans, cowpeas, peanuts, lentils, nut, soy, pigeon pea, chick peas, Groundnut; Ground Bean; green peas, Cow Pea; and / or other nuts</p> | <p>4. المكسرات والبقول : الفاصوليا، العدس، الحمص، الفول السوداني، الفول، البازلاء الخضراء، اللوبيا، وغيرها جوز-لوز-صنوبر /نواة) ، (البازلاء الحلوة)</p> |
| <p>5. How many days over the last 7 days, did members of your household eat: Milk and other dairy products: fresh milk / sour, yogurt, lebneh, cheese, other dairy products (Exclude margarine / butter or small amounts of milk for tea / coffee)</p> | <p>5. الحليب ومنتجات الحليب (حليب طازج أو مجفف، اللبن، اللبنة، الجبن، منتجات الحليب الأخرى - بإستثناء السمنة / الزبدة أو كميات صغيرة الحليب لصنع الشاي / القهوة</p> |
| <p>6. How many days over the last 7 days, did members of your household eat: Meat, fish and eggs: goat, beef, chicken, pork, blood, fish, turkey, including canned tuna, escargot,</p> | <p>6. اللحوم والأسماك والبيض: الماعز، البقر والدجاج ولحم الخنزير، والأسماك، وديك الرومي، بما في ذلك التونة المعلبة، فوطة، و / أو غيرها من المأكولات البحرية والبيض (اللحوم والأسماك المستهلكة بكميات كبيرة وليس باعتبارها مطببات. (إذا صفر</p> |

| | |
|---|--|
| and / or other seafood, eggs (meat and fish consumed in large quantities and not as a condiment). (if 0 skip to section k) | انتقل إلى القسم ك) |
| 7. How many days over the last 7 days, did members of your household eat: Flesh meat: beef, pork, lamb, goat, rabbit, chicken, duck, turkey other birds | 7. اللحوم الحمراء: لحم البقر، لحم الماعز، لحم الخنزير، الدجاج، الديك الرومي، الأغنام، اللحوم الأخرى. |
| 8. How many days over the last 7 days, did members of your household eat: Organ meat: liver, kidney, heart and / or other organ meats | 8. اللحوم العضوية: الكبد، الكلى، القلب و / أو غيرها من اللحوم العضوية |
| 9. How many days over the last 7 days, did members of your household eat: Fish/shellfish: dried, fresh and smoked fish, including canned tuna, and / or other seafood (fish in large quantities and not as a condiment) | 9. الأسماك: الأسماك المجففة، الطازجة، المدخنة، مأكولات بحرية أخرى (باستثناء صلصة ومسحوق السمك) الأسماك المستهلكة بكميات كبيرة وليس باعتبارها مطيبات |
| 10. How many days over the last 7 days, did members of your household eat: Eggs | 10. بيض |
| 11. How many days over the last 7 days, did members of your household eat: Vegetables and leaves: spinach, onion, tomatoes, carrots, peppers, lettuce, cucumber, radish, cabbage etc. (If 0 skip to section o) | 11. الخضروات والأوراق: السبانخ والبصل والطماطم والجزر والفلفل، والخس، والخيار والفجل والملفوف وغيرها. (إذا صفر انتقل إلى القسم م) |
| 12. How many days over the last 7 days, did members of your household eat: Orange vegetables (vegetables rich in Vitamin A): carrot, red pepper, pumpkin, squash, orange sweet potatoes | 12. الخضار الغنية في الفيتامين أ (اليقطين، القرع، الفلفل الأحمر، الجزر، البطاطا الحلوة) الخضار البرتقالية و المتنوعة الالوان |
| 13. How many days over the last 7 days, did members of your household eat: Green leafy vegetables: spinach, broccoli, amaranth and / or other dark green leaves, cassava leaves, wild leaves, chicory, rockets, mulukhiyi | 13. الخضار ذات الأوراق الخضراء: السبانخ، البروكلي، قطيفة و / أو غيرها من الأوراق الخضراء الداكنة، وأوراق من الكسافا والأوراق البرية، الهندباء البرية والروكا والملوخية |
| 14. How many days over the last 7 days, did members of your household eat: Other vegetables: onion, cucumber, radish, tomatoes, eggplants, zucchini etc... | 14. الخضار الأخرى: البصل والخيار والفجل والطماطم والباذنجان والكوسا الخ ... |
| 15. How many days over the last 7 days, did members of your household eat: Fruits: | 15. الفاكهة: الموز، التفاح، الليمون والمانجو والبابايا والمشمش والخوخ والبطيخ |

| | |
|---|---|
| banana, apple, lemon, mango, papaya, apricot, peach, waterlemon etc. (If 0 skip to section r) | وغيرها. (إذا صفر انتقل إلى القسم ف |
| 16. How many days over the last 7 days, did members of your household eat: Orange fruits (Fruits rich in Vitamin A): mango, papaya, apricot, peach | 16. الفاكهة الغنية في الفيتامين أ : المانجو، المشمش، الدراق، البابايا، والفاكهة البرتقالية اللون |
| 17. How many days over the last 7 days, did members of your household eat: Other fruits: Banana, Apple, watermelon, cherry, dates | 17. الفواكه الأخرى: الموز، ألتفاح، البطيخ، الكرز، والتمر |
| 18. How many days over the last 7 days, did members of your household eat: Oil / fat / butter: olive oil, other vegetable oil, gee, Butter, margarine, other fats / oil | 18. الدهون / الزيوت (زيت الزيتون، الزيت النباتي، زبدة، سمن، الدهون أخرى) |
| 19. How many days over the last 7 days, did members of your household eat: Sugar, or sweet: sugar, honey, jam, cakes, candy, cookies, pastries, cakes and other sweet (sugary drinks) | 19. لسكر / المنتجات السكرية/ العسل (السكر، قصب السكر، العسل، مربى، جيلي، حلويات / بونبون/ الشوكولاته، وغير ذلك من منتجات السكر والبسكويت والباتيسري والكعك |
| 20. How many days over the last 7 days, did members of your household eat: Condiments / Spices: tea, coffee / cocoa, salt, garlic, spices, yeast / baking powder, lanwin, tomato / sauce, meat or fish as a condiment, ketchup/hot sauce; u.Maggy cubes, powder; other condiments including small amount of milk / tea coffee | 20. بهارات / توابل (شاي، قهوة، نسكافيه / كاكاو، ملح، توابل، خميرة / باكنج بودر، كاتشب/ صلصة حارة، مكعبات ماجي، بهارات أخرى - بما في ذلك كميات صغيرة من الحليب لصنع الشاي / القهوة |

APPENDIX III

EXPENDITURE MODULE (ARABIC AND ENGLISH)

| Category | الفئة | مثال |
|--|--|---|
| Food and Beverages | المواد الغذائية والمشروبات | |
| Clothing and Footwear | الألبسة والأحذية | أقمشة الملابس الملابس أصناف ألبسة أخرى وكمايات للألبسة تنظيف وتصليح واستئجار الألبسة الأحذية تصليح واستئجار الأحذية |
| Housing, Water, Electricity, Gas and Other Fuels, and household maintenance | مسكن وماء وغاز وكهرباء ومحروقات أخرى, وصيانة مستمرة للمنزل | الإيجارات المدفوعة فعلياً من المستأجر إيجارات فعلية أخرى لوازم أعمال صيانة وتصليح المسكن خدمات تتعلق بصيانة وتصليح المسكن تزويد المياه جمع النفايات المنزلية الصرف الصحي للمياه المبتدلة خدمات مشتركة أخرى متعلقة بالمسكن الكهرباء الغاز وقود سائل, ووقود صلب |
| Health | الصحة | منتجات صيدلانية منتجات طبية أخرى الأجهزة والمعدات العلاجية خدمات طبية (معاينة طبية) خدمات أطباء الأسنان خدمات طبية أخرى خدمات الاستشفاء |
| Transportation | النقل | سيارات دراجة نارية دراجة هوائية صيانة وتصليح وسائل النقل النقل البري خدمات النقل الأخرى |

| Category | الفئة | مثال |
|------------------------------------|------------------------------|--|
| Recreation, Amusement, and Culture | الإستجمام والتسليية والثقافة | لعب وألعاب ووسائل تسلية ألعاب الحظ كتب جرائد ومجلات مطبوعات أخرى القرطاسية وأدوات الرسم |
| Education | التعليم | رسوم تسجيل وأقساط برامج تعليمية أخرى |
| Agriculture | الزراعة | تأجي ,عمال ماء ,بذور سماد مبيدات حشويات الآت وسيط /نقل الى سوق كهربات مضخات المياه مداخلات أخرى |
| Other | سلع وخدمات متفرقة | تبغ وتنباك تأمينات سداد الديون الإتصالات /خدمات اتصالات البرق والهاتف |

APPENDIX IV

FOOD INSECURITY EXPERIENCE SCALE ARABIC FORM



Food and Agriculture Organization
of the United Nations

*Institutional Review Board
American University of Beirut*

01 MAR 2018

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The Food Insecurity Experience Scale (FIES)

*Guidance for translation:
intended meanings of the questions and specific terms*

English
Spanish
Portuguese
French
Arabic
Russian
Chinese
Albanian

FAO, July 2015

*Institutional Review Board
American University of Beirut*

15 MAY 2018

APPROVED

1



نسخة الإختبار التجريبي لعام 2015 خل مقياس (سلم) تجربة (معاينة) انعدام الأمن الغذائي العالمي
(GLOBAL-FIES)
ال مؤسسة غالوب العالمية للاستطلاع

أرغب بسؤالك بعض الأسئلة عن استهلاكك للغذاء خلال الإثني عشر شهراً الماضية

خلال الإثني عشر شهراً الماضية ، هل حدث وأن :

| | |
|--|--|
| س1. شعرت بالقلق بأنه لن يتوفر لك الطعام الكافي لتأكل بسبب عدم توفر النقود أو المصادر الأخرى؟ | يشير السؤال إلى حالة القلق أو الهم من عدم وجود غذاء كافي أو من نفاذ الطعام الموجود بسبب نقص النقود أو المصادر الأخرى. قد يعود سبب القلق أيضاً إلى الظروف التي قد تؤثر في قدرة المستجيب على تأمين الطعام كفقْدان الوظيفة أو عدم القدرة على إنتاج الغذاء أو تعطيل العلاقات الاجتماعية، أو فقْدان المساعدات الغذائية أو بسبب الأزمات السياسية والبيئية أو لأسباب أخرى قد تؤدي لنقص النقود لديه . إنه ليس من الضروري أن يكون المستجيب أو الأسرة قد فقّدت فعلاً الطعام حتى يجيب بالإيجاب على هذا السؤال . |
| س2. لم يكن باستطاعتك أكل طعام صحي ومغذي بسبب عدم توفر النقود أو المصادر الأخرى؟ | يسأل هذا السؤال المستجيب إذا ما كان غير قادر على تأمين الطعام الذي يعتبره صحياً أو الطعام المغذي والمتوازن . قد يحصل ذلك في حال عدم توفر النقود الكافية أو المصادر الأخرى لتأمين ما يعتبره المستجيب طعاماً صحياً ومغذي . يشير هذا السؤال إلى نوعية الغذاء وليس كمية الطعام المتناول أو المخاطر المتعلقة بالأكل كالتهاه صلاحية. |
| س3. أكلت أنواع قليلة من الأطعمة بسبب عدم توفر النقود أو المصادر الأخرى؟ | يسأل هذا السؤال عما إذا اضطرّ المستجيب أن يتناول وجبات قليلة التنوع من الطعام أو إذا كان يأكل نفس الطعام أو فقط عدد قليل من الأصناف كل يوم لأنه لم يكن لديه المال الكافي أو المصادر الأخرى لتأمين الطعام. يفترض هذا السؤال أن تحسين فرص الحصول على الغذاء تؤدي إلى تحسين نوعية الطعام ويشير لنوعية الغذاء وليس كمية الطعام المتناول . هذا لا يتضمن اتباع الحمية الغذائية لفقدان الوزن أو الصيام لأسباب صحية أو دينية . |
| س4. كان عليك أن تتخلى عن وجبة طعام بسبب نقص النقود أو المصادر الأخرى؟ | يستفسر هذا السؤال عن تجربة المستجيب فيما إذا اضطر على إستثناء أو التخلي عن " تأقي" كما يقال في العامية اللبنانية) وجبة رئيسية (مثل الإفطار أو الغذاء أو العشاء لعدة مرات بما يخالف الأعراف والتقاليد المتبعة في تناول الطعام) والتي كان يجب أن تؤكل وذلك بسبب نقص النقود أو المصادر الأخرى لتأمين الطعام . يشير هذا السؤال لنقص كمية الطعام المتناول . |
| س5. أكلت أقل مما اعتدت أنك يجب أن تأكل بسبب نقص النقود أو المصادر الأخرى؟ | يستفسر هذا السؤال عن تناول المستجيب لكمية من الطعام أقل مما يجب حتى إذا لم يستثنى وجبة رئيسية وذلك لأن الأسرة ليس لديها المال أو المصادر الأخرى اللازمة لتأمين الطعام . لا ينطبق هذا السؤال على الأفراد البالغين الذين يتناولون كميات قليلة من الطعام لتخفيف الوزن . إن الإجابة تعتمد على رأي المستجيب الخاص حول كمية الطعام التي يجب أن يتناولها وليس النوعية. |
| س6. نفذ الطعام لدى أسرتك بسبب نقص النقود أو المصادر الأخرى ؟ | يشير هذا السؤال إلى أي من التجارب التي تضمنت عدم وجود طعام للأسرة بسبب نقص النقود أو المصادر الأخرى (على سبيل المثال إنتاج الأسرة الخاص من الغذاء أو مقايضة الطعام) أو لأن الأكل الموجود لم يكفي الأسرة . |
| س7. كنت جائعاً لكأنك لم تأكل لأنه لم يكن هناك ما يكفي من النقود أو المصادر الأخرى للطعام؟ | يسأل هذا السؤال عن الشعور الفيزيائي بالجوع لدى المستجيب وبشكل خاص الشعور بالجوع مع عدم القدرة على تأمين الطعام بسبب نقص النقود أو المصادر الأخرى اللازمة لتأمين الطعام . هذا لا يتضمن اتباع الحمية الغذائية لفقدان الوزن أو الصيام لأسباب صحية أو دينية . |

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| يستفسر هذا السؤال عن تجربة معينة وهي عدم تناول أي شيء من الطعام ليوم كامل بسبب عدم توفر النقود أو المصادر الأخرى. هذا لا يتضمن اتباع الحمية الغذائية لتفقدان الوزن أو الصيام لأسباب صحية أو دينية. | س8. بقيت دون تناول الطعام ليوم كامل بسبب نقص النقود أو المصادر الأخرى؟ |
|--|--|

| المعنى المقصود والاقتراحات من أجل العثور على العبارة الصحيحة | العبارة |
|--|-------------------------------|
| هناك طرق مختلفة للإشارة إلى فترة 12 شهراً التي سبقت المقابلة ، بما في ذلك "العام الماضي" ، وينبغي الحرص على إيجاد أفضل عبارة لتفادي الخلط مع تصورات شبيهة أخرى لفترة 12 شهراً ، مثل الموسم الزراعي أو السنة التقويمية الدينية . | الإثني عشر شهراً الماضية |
| بالإضافة إلى المال لشراء الطعام ، تشير عبارة "الموارد الأخرى" إلى نقص الوسائل العادية الأخرى للحصول على الطعام ، مثل الانتاج الخاصة للأسرة و الحيوانات الصغيرة المعدة للبيع أو الاستهلاك الخاص و المقايضة و التجارة و صيد الأسماك و الصيد أو الجمع . | نقص من النقود والموارد الأخرى |

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APPENDIX V
FOOD INSECURITY EXPERIENCE SCALE FORM
(ENGLISH)



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The Food Insecurity Experience Scale (FIES)

*Guidance for translation:
intended meanings of the questions and specific terms*

English
Spanish
Portuguese
French
Arabic
Russian
Chinese
Albanian

FAO, July 2015

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Questions that compose questionnaire and explanations of the intended meanings

| <p><i>"Now I would like to ask you some questions about food.. During the last 12 MONTHS, was there a time when:</i></p> | |
|--|--|
| <p>Q1. You were worried you would not have enough food to eat because of a lack of money or other resources?</p> | <p>The question refers to a state of being worried, anxious, apprehensive, afraid or concerned that there might not be enough food or that food will run out of food (because there is not enough money or other resources to get food)</p> <p>The worry or anxiety is due to circumstances affecting their ability to procure food, such as: loss of employment or other source of income, or other reasons for not having enough money; insufficient food production for own consumption; insufficient food available for hunting and gathering; disrupted social relationships; loss of customary benefits or food assistance; environmental or political crises. It is not necessary for the respondent to have actually experienced not having enough food or running out of food to answer yes to this question.</p> |
| <p>Q2. You were unable to eat healthy and nutritious food because of a lack of money or other resources?</p> | <p>This question asks the respondent whether s/he was not able to get foods they considered healthy or good for them, foods that make them healthy, or those that make a nutritious or balanced diet (because there was not enough money or other resources to get food.)</p> <p>The answer depends on the <u>respondent's own opinion</u> of what <i>they</i> consider to be healthy and nutritious foods.</p> <p>This question refers to the <u>quality</u> of the diet and not the quantity of foods eaten.</p> |
| <p>Q3. You ate only a few kinds of foods because of a lack of money or other resources?</p> | <p>The question asks if the respondent was forced to eat a limited variety of foods, the same foods, or just a few kinds of foods every day because there was not enough money or other resources to get food. <i>The implication is that the diversity of foods consumed would likely increase if the household had better access to food.</i></p> <p>Alternative phrases:</p> <ul style="list-style-type: none"> • You ate meals with a limited variety of foods; • You ate the same foods or just a few kinds of foods every day; • You <u>had to</u> eat a limited variety of foods; • You <u>had to</u> eat the same foods every day; • You <u>had to</u> eat just a few kinds of foods. <p>This question refers to quality of the diet and not the quantity of foods eaten. It implies lack of money/resources rather than customary habits or other circumstances (i.e., health or religion) as the reason for limiting the variety of food .</p> |
| <p>Q4. You had to skip a meal because there was not enough money or other resources to get food?</p> | <p>This question inquires about the experience of having to miss or skip a major meal (for example, breakfast, lunch or dinner depending on the norm for number and times of meals in the culture) that would normally have been eaten (because there was not enough money or other resources to get food.)</p> <p>This question refers to <u>insufficient quantity</u> of food.</p> |
| <p>Q5. You ate less than you thought you should because of a lack of money or other resources?</p> | <p>This question inquires about eating less than what the respondent considered they should, even if they did not skip a meal (because the household did not have money or other resources to get food).</p> <p>The answer depends on the <u>respondent's own opinion</u> of how much <i>they</i> think they should be eating.</p> <p>This question refers to <u>quantity</u> of foods eaten and not the quality of the diet.</p> <p>This question does <i>not</i> refer to special diets to lose weight or for health or religious</p> |

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| | reasons. |
| Q6. Your household ran out of food because of a lack of money or other resources? | Referring to any experiences when there was actually no food in the household because they did not have money, other resources, or any other means to get food . |
| Q7. You were hungry but did not eat because there was not enough money or other resources for food? | This question asks about the physical experience of feeling hungry , and specifically, feeling hungry and not being able to eat enough (because of a lack of money or resources to get enough food). It does not refer to special diets to lose weight or fasting for health or religious reasons. |
| Q8. You went without eating for a whole day because of a lack of money or other resources? | This question asks about a specific behaviour—not eating anything all day (because of a lack of money and other resources to get food). It does not refer to special diets to lose weight or fasting for health or religious reasons. |

| PHRASE | INTENDED MEANING AND SUGGESTIONS FOR FINDING THE RIGHT PHRASE |
|--|--|
| <i>Past 12 months</i> | There are different ways to refer to the 12 month period preceding the interview, including “the past year”. Care should be taken to find the best phrase to avoid confusion with other common conceptualizations of a 12-month period, such as an agricultural season or religious calendar year. |
| <i>Lack of money and other resources</i> | In addition to money to buy food, “other resources” refers to the lack of other usual means for getting food, such as own production, small livestock for sale or own consumption, barter, trade, fishing, hunting or gathering. |

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