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Vulnerability and Livelihood Influences of Urban Agriculture and Fruit and Vegetable Value Chains in Lebanon

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Abstract

Agriculturalists in Lebanon are exposed to a wide range of vulnerability factors that have direct impacts on farmers' livelihoods. To evaluate the effects of those factors and the livelihood challenges they breed, this research analyses how two agricultural activities shape farmer livelihood vulnerability, namely urban agriculture and fruit and vegetable value chains. First, I analyze how vulnerability factors influence urban agriculturalist livelihoods and assess if urban agriculture is an adequate solution to lower their livelihood vulnerability. Second, I analyse how various actors partaking in fruit and vegetable value chains are exposed to different vulnerability factors and how this impacts their individual livelihoods. Conceptually, the urban agriculture component of this research builds from the vulnerability framework and sustainable livelihoods approaches scholarships. The agricultural value chain section engages with literatures centered on the vulnerability framework, sustainable livelihoods approaches and value chain analysis.

This thesis concludes that the main vulnerability factors associated with urban agriculture relate to physical, financial and human capitals, and that urban agriculture is not an adequate tool to reduce the livelihood vulnerability of urban agriculturalists. I also conclude that social, financial and human capital barriers significantly affect agricultural value chains actors' livelihoods. Overall, the vulnerability of the different actors is linked to their socioeconomic status, which dictates the amount of human capital they possess, thus their ability to adapt to changing conditions and external stressors. I posit that human capital is key to both urban agriculture and agricultural value chains, as this asset dictates the vulnerability of individual livelihoods and Lebanese agriculturalists' ability to sustain their livelihoods.

Résumé

Les activités agricoles au Liban sont exposées à divers facteurs de vulnérabilité, qui ont des répercussions directes sur les moyens de subsistance des agriculteurs. Pour évaluer les effets de ces facteurs et les défis qui s'ensuivent, cette recherche analyse la manière dont deux activités agricoles façonnent la vulnérabilité des moyens de subsistance des agriculteurs, à savoir l'agriculture urbaine et les chaînes de valeur agricoles pour les fruits et légumes. Tout d'abord, j'analyse comment les moyens de subsistance des agriculteurs urbains sont influencés par différents facteurs de vulnérabilité et j'évalue si l'agriculture urbaine est un outil adéquat pour réduire leur vulnérabilité ou non. Deuxièmement, j'analyse les facteurs de vulnérabilité de différents acteurs impliqués dans les chaînes de valeur agricoles pour les fruits et légumes, et leur impact sur les moyens de subsistance de ces individus. Conceptuellement, la première composante de cette recherche est réalisée à l'aide du cadre de vulnérabilité et des approches de moyens d'existence durables. La deuxième composante de cette recherche repose sur les littératures dédiées au cadre de vulnérabilité, aux approches sur les moyens de subsistance durables et aux chaînes de valeurs.

La thèse conclut que les principaux facteurs de vulnérabilité auxquels les agriculteurs urbains sont exposés sont liés au capital physique, financier et humain, et que l'agriculture urbaine n'est pas un outil adéquat pour réduire la vulnérabilité des individus qui pratiquent cette activité. Je conclus également que des barrières à l'accès au capital social, financier et humain affectent considérablement les moyens de subsistance de différents acteurs des chaînes de valeur agricoles. Dans l'ensemble, le niveau de vulnérabilité de différents acteurs agricoles est lié à leur statut socio-économique, lequel influence leur accès au capital humain, et leur capacité à s'adapter à l'évolution des conditions et aux facteurs de stress externes. Le capital humain est central, dans la mesure où il conditionne la vulnérabilité des moyens de subsistance des individus et leur capacité à maintenir leurs moyens de subsistance.

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Summary Table

Chapter 1: Introduction

Rahim[1] lives in a village in the mountains behind Jounieh in the northern suburbs of Beirut, Lebanon. Each day, the 30-year-old farmer drives over an hour through dense traffic to his small plot of land in Batroun. He cultivates several kinds of crops, such as cherimoyas (a green fruit with a fatty white flesh), jujubes, avocadoes and olives. Two to three times a week, his commute is longer as he drives another hour to Beirut to deliver some of his production to the city's biggest wholesale market in Bir Hassan. Contrary to other small-scale farmers, he does not sell to the local wholesale market in Jbeil. With the help of his contacts, he was able to start selling in Beirut, which allowed him to get better prices for his fruits and sell higher volumes. This opportunity to get better prices, along with direct sales to consumers from the farmer cooperative he is involved in, makes him an outlier among farmers in terms of revenue and reduced vulnerability.

Rahim's story offers an overview of the factors shaping the vulnerability of agriculturalists in Lebanon. Agriculture in Lebanon is a vulnerable and deteriorating activity. In 2017, agriculture made up 3.5% of Lebanon's GDP, employed 12.2% of the population and covered 64.3% of the country territory (FAO, 2018; The World Bank, 2018). Arable lands and permanent crops cover 25.2% of the country, while pasture lands occupy 39.1% of the national territory. From 1994 to 2016, Lebanon's agricultural production had declined by 20.3%, contrasting sharply with what occurred in neighbouring countries such as Jordan, Turkey and Syria where agricultural outputs increased by 52%, 34% and 17%[2] respectively over the same period (The World Bank, 2018). However, the decrease in Lebanon's

[1] All names are pseudonyms except otherwise stated.
[2] Growth rate amounted to 36% in Syria between 1994 – 2011, when the ongoing Syrian Civil War erupted.

agricultural production differs depending of the agricultural activity. For instance, cereal production has grown by 119.2% from 1994 to 2016, and livestock production rose by 17% during the same period (The World Bank, 2019; The World Bank, 2019a). However, fruits and vegetable productions, which are one the main interests of this thesis and respectively accounted for 47% and 23% of Lebanon's agricultural output in 2010, experienced a cumulative 54.3% production drop over the 1994-2016 period (FAO, 2018; IDAL, 2010). Fruits make a third of Lebanon's fruit and vegetable agricultural production (mainly apples, oranges, bananas, grapes and olives), while vegetables account for two thirds (mainly potatoes, tomatoes and maize) (Saaf, et al., 2018).

Agriculture represents a neglected part of Lebanon's economy as it is barely supported by the government, which aims to develop the country's manufacturing and service sectors instead (Hamade, et al., 2014). The state provides scarce training to farmers, creating a void filled by agricultural input providers and NGOs. The country's agriculture faces several challenges such as salinization and depletion of its groundwater resources, reduced precipitations and climate change (Chenoweth, et al., 2011; El Chami, et al., 2009; Ghiotti, et al., 2013; Nasr, et al., 2004). The vulnerability of farmers in Lebanon is well documented in regards to the impacts of climate change, environmental degradation, and urbanization (El Chami, et al., 2009; Ghiotti, et al., 2013; Nasr, et al., 2004). However, less is known about other components of farmers' vulnerability, including those I address in this thesis.

My research analyses how two agricultural activities shape various actors' livelihood vulnerabilities, namely; urban agriculture (UA) and agricultural value chains for fruits and

vegetables[3]. This thesis approaches farmer livelihood vulnerability contexts through the sustainable livelihood lens. As such, I assess how two undocumented agricultural activities shape the multifaceted vulnerability of farmers in Lebanon. While my thesis highlights the differences between those activities, it also demonstrates that it is relevant to address them simultaneously. While urbanites practice UA to enhance their livelihoods and value chains concern professional farmers, both agricultural activities represent processes which favor higher socioeconomic (SES)[4] individuals. This thesis demonstrates and details this bias toward higher SES individuals and how these activities are not well adapted for individuals of lower socioeconomic status, who become highly dependent on external support. Moreover, although all livelihood capitals come about in shaping the outcomes of those activities in both instances, human capital appears to play a central role in particular. Those resemblances make it important to compare those two agricultural activities and look at how their vulnerability contexts are similar and different.

Purpose of the Study

The purpose of this research is twofold. First, it aims to look at the challenges that urban agriculturalists face in Lebanon. Urban agriculture is an agricultural activity that is said to reduce food insecurity and increase the economic well-being of low-income households (Dixon, et al., 2009; Germain, et al., 2006; Maachou, et al., 2016; Magigi, 2013; Maxwell, 1995). Urban agriculture differs from conventional agriculture given its different practices and limitations. Therefore, UA involves a distinct vulnerability context compared to

[3] "Agricultural value chains for fruits and vegetables", "fruit and vegetables value chains" and "agricultural value chains" are understood as the same concept in this thesis and I use them interchangeably.

[4] I understand that socioeconomic status is shaped by wealth, income, education and occupation (Kraus, et al., 2009). I use this term as an alternative to 'class' which, as emphasised in Marxist scholarship, refers to ownership of the means of production (Schooler, 2013). I struggled to find a concept that accounts to the education (human capital), income (financial capital), and social status (social capital) levels of an individual.

conventional agriculture. By looking at how urban agriculture influences urbanites's own vulnerability contexts, the research first aims to assess the feasibility, or lack thereof, of the studied NGO-sponsored UA projects targeting lower SES individuals in Lebanon.

Second, the study aims to achieve a comprehensive understanding of fruit and vegetable commodity chains[5] in Lebanon, so as to highlight the complex social encounters that shape the supply of fruits and vegetables from farmers to consumers. As with urban agriculture, the agricultural value chain component in this thesis assesses an underappreciated aspect of farmer livelihoods, rural in this instance. Examining how fruits and vegetables are distributed and how supply chains unfold over time is key to understanding rural development (Marsden, et al., 2002).

The widely assumed definition (Mougeot, 2000) of UA encompasses a variety of agrarian practices undergoing in urban contexts, the most documented of which span growing plots of land in urban contexts and rooftop gardening. There is a reasonable amount of scholarship focussing on urban-based farming in Lebanon and in the Middle East (cf Joe Nasr (2004), Martine Padilla (2004) and Salwa Thomé Tawk (2014)). On the other hand, less is known about rooftop gardening in Lebanon.[6] Thus, in this thesis, unless otherwise stated, UA refers to farming activities that people undergo on balconies or rooftops for personal-consumption purposes (cf Chapter 4). Available studies indicate that UA has yielded some positive outcomes in some countries, mostly in sub-Saharan Africa and South America, but conclusions vary depending on the local context and environmental variables (De Bon, et al., 2010; Maxwell, 1995; Mougeot, 2005; Robineau, 2015; Zezza, et al., 2010). This variability

[5] In this thesis, value chains and commodity chains are understood as synonyms, not as distinct concepts as in the French literature (Bair, 2010).

[6] However, rooftop gardening in other Middle East countries is relatively well documented (Dubbeling, et al., 2014; Surani, 2003; Tawk, et al., 2014; de Zeeuw, et al., 2017).

requires that local specificities be analysed extensively to assess the usefulness of UA in a particular context, in this case Lebanon.

Meanwhile, little is known about how fruit and vegetable value chains affect farmer vulnerability contexts in Lebanon. Only some reports have analysed local agriculture value chains in Lebanon to some extent (CBI, 2016; ESCWA, 2013; USAID, 2014). Literature about agricultural value chains mostly follows the global value chains perspective, which tends to omit the livelihoods of those participating in agricultural value chains, and how they evolve in complex social networks (Gerber, et al., 2014). However, the social dynamics at play in fruit and vegetable value chains have direct consequences for farmer livelihoods, dictating the price of fresh fruits and vegetables, and therefore financial revenues (Maertens, et al., 2015). Price regimes affect the farmers' ability to withstand stressors such as water scarcity and urban expansion, and thus their ability to maintain their livelihoods.

Research Objectives and Thesis Structure

As with its purpose, the objectives of this research are twofold. First, I aim to assess if UA is an adequate tool to lower urban household vulnerability of in Lebanon. Second, I aim to assess if farmers' ability to navigate agricultural value chains allows them to reduce their livelihood vulnerability or not. As such, this paper seeks to answer the three following research questions.

Research Question 1: Which factors influence the capacity of Lebanese urbanites to undertake urban agriculture?

Research Question 2: Which factors influence the commodity chains that Lebanese farmers partake in?

Research Question 3: How do these factors influence the vulnerability contexts of farmer livelihoods?

In order to answer these questions, I first present my research methods and methodology in chapter 2. I explain the circumstances that led me to thoroughly revise my initial research project and hypothesis. I then address the study sites, my positionality and that of my research assistant. Finally, I describe how I gathered and analysed the data.

In chapter 3, I outline the theoretical framework I developed, which focuses on vulnerability, the sustainable livelihoods approaches and agricultural value chains. Chapter 4 contextualizes urban agriculture developments in the Middle East and unpacks fruit and vegetable value chains in Lebanon. Chapter 5 details my research results and the factors that impede the practice of urban agriculture in my research sites. Chapter 6 documents the different ways that fruits and vegetables reach consumers, and the factors at play in the complex commodity chains overseeing these exchanges.

Finally, Chapter 7 summarizes my results and connects urban agriculture to value chains. As revealed during my research, those two distinct aspects are closely related in their challenges and limitations.

Chapter 2: Research Methods & Methodology

Introduction

Qualitative work in social sciences is as complex as its object of study, and fieldwork is essential as it rectifies initial perceptions and ideas (Hope, 2009). I did fieldwork over a period of 48 days, from September 12, 2018 to October 30, 2018. I encountered a number of challenges at the beginning of my fieldwork as I explain below. These difficulties brought me to change my research design and organize it around two core components, namely urban agriculture and commodity chains.

This chapter begins with a discussion on the circumstances of the investigation. Afterwards, I introduce the study sites where I gathered my data through interviews and observations. I address my positionality as a researcher in Lebanon and how it affected my data collection processes. I also introduce my research assistant/interpreter, as her positionality is critical to understand the context in which the data was collected. I demonstrate how my research assistant and I adjusted the interview format to create the best environment possible for interviewees. I then outline the methodology I adopted in this research by first explaining the sampling strategies, type of interviews, and type of observation I utilised during my fieldwork and then how I coded and analysed my data.

Circumstances of the Investigation

I entered the field with the aim to assess whether urban agriculture could lower the vulnerability of low-income individuals to the impacts of climate change. More precisely, I initially designed my research around urban agriculture and the potential opportunities it could offer to reduce the vulnerability of Lebanese farmers towards climate change. This idea partly emerged from scholarship highlighting the usefulness of UA within climate adaptation

strategies, as UA is said to promote recycling and reduce water resource degradation (Maxwell, 1995; Mougeot, 2005; Paavola, 2008; de Zeeuw, et al., 2017; Zezza, et al., 2010). In order to assess the suitability of urban agriculture as a tool to reduce vulnerability to climate change in Lebanon, I conducted a case study of an urban agriculture project implemented in Bourj Hammoud, a city next to Beirut, in 2015-2016. The NGO Near East Foundation (NEF) conducted this project in partnership with the Environment and Sustainable Unit (ESDU) of the American University of Beirut (AUB) and the local YMCA branch. The project's goal was to increase the food security and the economic resilience of 94 participants from 72 low-income households (Near East Foundation, 2017).

I planned to contact the participants of the project through a gatekeeper, an affiliate teacher with the American University of Beirut (AUB), who was a liaison between NEF and project participants. However, my plans changed as I was not able to connect with any participants after the gatekeeper stopped responding to my emails. I had difficulties reaching him after arriving in Lebanon, as I was only able to reliably speak to him on Saturdays at the Souk el Tayeb in downtown Beirut where he was selling products. Unfortunately, due to various circumstances the gatekeeper was unable to connect me with the project participants.

The challenges I encountered prompted me to change the purpose of my study, so that it better accounted the realities of the field and the vulnerabilities I observed. Thus, the purpose of the study became twofold: assessing the factors that influenced the practice of urban agriculture and assessing the impacts of agricultural value chains on farmer livelihoods. This change in purpose is attributed to the information I already had about value chains. My research on urban agriculture brought me in contact with farmers, acquainted me with

farmers' markets, and introduced me to the dynamics at play in the process of bringing produce to consumers. This introduction to fruit and vegetable value chains was an outcome of trying to find people who participated in urban agriculture projects on my own, bypassing the need for a gatekeeper.

Study Sites

Fieldwork was mainly undertaken in the city of Beirut (pop. 363,033)[7] (UNData, 2011) and Bourj Hammoud (pop. 104,873) (Harake, et al., 2017), located in the Mount Lebanon district in Lebanon. Beirut is a major hub in the fruit and vegetable value chain, as the Greater Beirut area houses a third of Lebanon's population and the biggest fruit and vegetable market in the country. Bourj Hammoud hosts the urban agriculture project of my initial research. Although I did not focus on this project as much as I first expected, Bourj Hammoud provides an example of a low-income neighbourhood such as those that urban agriculture projects typically favour. My fieldwork also extended beyond the Greater Beirut area, as I had done observations and/or interviews in markets and plantations in Jounieh, Jbeil, Tripoli, Menjez and Baalbek (Figure 1).

Figure 1 Cities where interviews and/or observation have been done

[7] This number solely includes the city of Beirut, and not its metropolitan area.

Within Beirut, I conducted most of my interviews and observations at farmers' markets and wholesale markets. Those sites are important to my research as they represent important nodes in the agricultural value chains for fruits and vegetables, being located halfway between producers and consumers, and dictating the price of fruits and vegetables and farmer incomes.

The farmers' markets I attended include Badaro Farmer's Market, which opens on Sundays and is geared toward making farm products accessible to the general population. I went to Souk el Tayeb, a downtown market that opens every Saturday, and in Clémenceau every Wednesday. Souk el Tayeb is geared toward organic products, the latest culinary and health trends, and caters to the upper-middle class. Lastly, I went in Souk Jana Loubnan, an annual farmers' market organized by Fair Trade Lebanon. The October 2018 Souk Jana Loubnan was the third edition of the market which aims to give visibility to rural producers and bring goods produced within rural coops to Beirut. The market this year had over 50

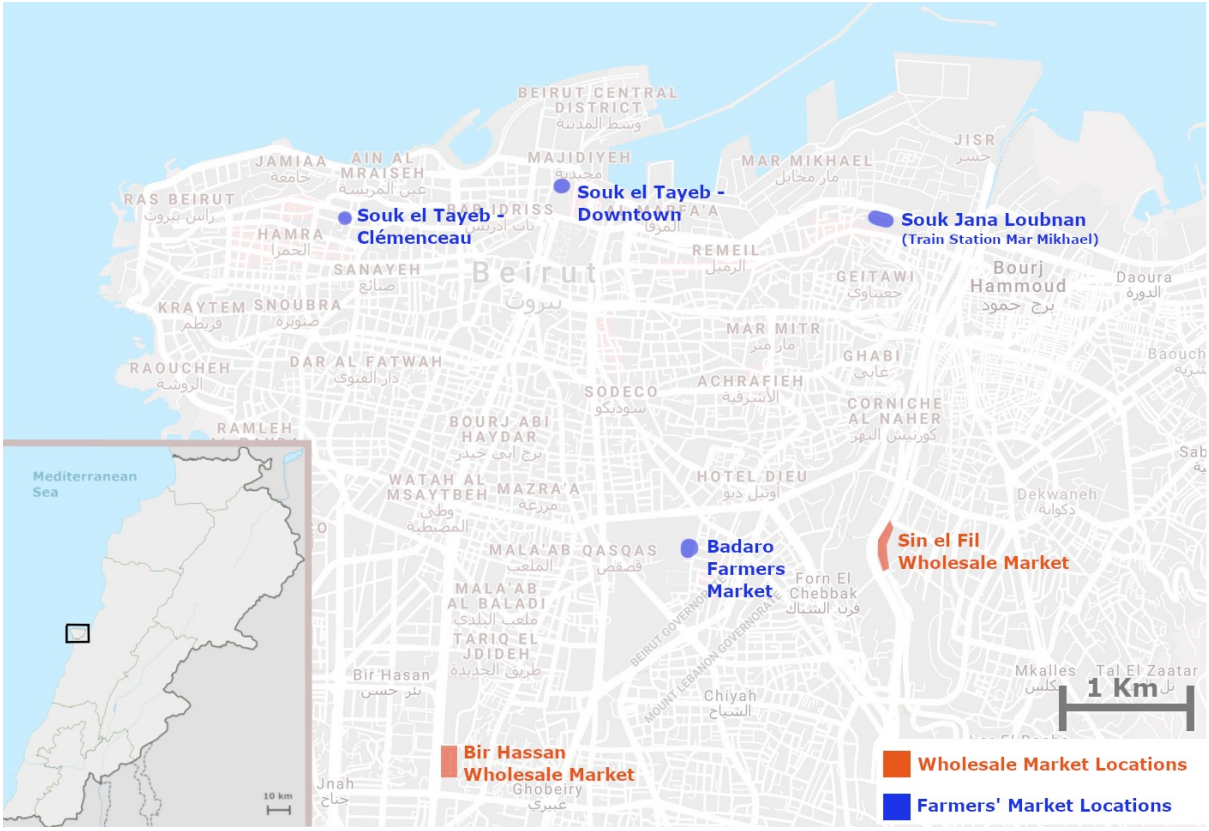

Figure 2 Locations of Farmers' markets and Wholesale markets where fieldwork was conducted in Beirut

merchants and was from October 12 to October 14 at Train Station Mar Mikhael (Figure 2). As for wholesale markets, there are three wholesale markets in the Beirut region, and I visited the two most important located at Bir Hassan and at Sin el Fil (Figure 2).

Positionality

My positionality as a master's student plays a significant role in shaping both the results I obtained and how I obtained them.

In the course of this project, I both travelled to the Middle East and conducted fieldwork for the first time. Doing fieldwork in Lebanon was a new experience for me as most of my earlier travels occurred in 'developed' countries such as France, Germany, Italy or Japan. This first experience in a 'developing' country influenced my positionality as I was not used to this type of environment, and this shaped how I observed my surroundings and where I gathered data. However, my prior knowledge of Lebanon, support from my supervisor and my own willingness to demonstrate my adaptability helped me adapt faster to this new experience and mitigate tendencies and biases I had at the beginning of my fieldwork, which I further detail below.

In order to get the 'pulse of life' of my surroundings when I travel, I try to blend in with the local population as best I could as to not be perceived as a tourist. My fieldwork in Lebanon was no exception to my longing to act as a local, which was heightened, as I did not want my positionality to greatly affect my interactions, nor the data I could acquire through observation. The fact that the Lebanese locals sometimes addressed me in Arabic suggests I was being perceived as Lebanese most of the time.[8]

[8] This only happened when I wore a small beard; I was systematically singled out as a foreigner after shaving.

Despite my efforts, I made some minor errors that singled me out as a foreigner. It appears that there are relatively few foreigners travelling to Lebanon. For instance, I noticed only few tourists in the country, mostly in downtown Beirut. In 2017, the country received only 1,9 million tourists, compared to neighbouring countries such as Jordan and Turkey who received respectively 3,8 and 37,6 million tourists that same year (The World Bank, 2019b).[9] When I was singled out as a foreigner, people seemed suspicious of my presence in Lebanon and less keen to share their experiences.[10] By example, when I was perceived as a foreigner, I was intercepted at the entrance's gates of AUB and asked to explain my visit. I also walked frequently, which is uncommon in a country where cars are the main mode of transportation. In one instance when I was walking in the outskirts of Bourj Hammoud on a quest to find urban agriculture installations, the driver of a Sprinter-type delivery vehicle passed by me, stopped, and asked me (in Arabic) if I was lost or needed a lift. I was also dressed in a way that may have suggested I was a Lebanese of middle-high socioeconomic status (SES), which might have influenced how people perceived and responded to me.

My positionality as an individual from a 'wealthy' and 'developed' country where levels of inequality are relatively low made me feel somewhat uncomfortable with the high inequalities existing in Lebanon, which initially affected the data I gathered. This incited me to stay in wealthier areas that made me feel safer, and where I encounter less poverty and avoided the fumes from inadequate sewer systems in poorer areas such as Bourj Hammoud. However, my behaviour changed with time as I began to get more accustomed with the

[9] Syria is omitted here because the country stopped collecting data on tourists after the Syrian Civil War (2011-ongoing) erupted. Syria received 5 million tourists in 2011.

[10] I thank Dr. Abu-Zahra for pointing out that this might partly be due to the fact that it is common knowledge that foreign agents have long been active in Lebanon. I, of course, had no link to any government agency while in the country.

Lebanese reality and society. Thus, with time I explored the various areas of Beirut further without feeling unsafe, and I became more accustomed to observing different socioeconomic realities.

As I communicated with locals, I sometimes found it quite hard to speak to people or to engage in deep conservation even though this might have yielded denser data. I was anxious to spontaneously speak to people, as I was shy and afraid that I could misstep. I tended to see all my interactions with potential informants as fundamentally transactional, which made it hard for me to speak to somebody if I had not planned to buy something from that person as an exchange in advance. I had more ease communicating with women, as they often seemed more inclined to speak to me and were friendlier than men. Lastly, I was much more confident when introduced to individuals, as it helped initiate the conversation. One example of this was at the Badaro Farmers Market where one of the volunteers introduced me to the various traders, making it easier for me to initiate conversational interviews. In turn, I found these interviews were very beneficial to my research.

My limited capacity to communicate with Lebanese people had an impact on my data collection. Prior to my departure, numerous people, either Lebanese or individuals knowledgeable about Lebanon, assured me that I would be able to speak to Lebanese people in French or English quite easily, as French and English are mandatory in the Lebanese education curriculum. Some locals also alluded to this during my stay in Lebanon. Lebanese or not, the people who argued I could easily manoeuvre Lebanon speaking French or English were all of higher socioeconomic status. Consequently I discovered I was only able to speak English or French to informants of higher socioeconomic status, who had access to high-

quality education and can therefore learn French and English.[11] The socioeconomic disparities existing in Lebanon made it impossible to communicate in French or English with most individuals I encountered randomly without the help of an interpreter.

The difficulties to communicate in English or French somewhat created a bias in my research, as I relied heavily on informants who were able to speak those languages. As I mainly interviewed individuals of higher SES, one could argue that my research does not provide an accurate representation of the Lebanese society. However, I was aware of this bias and tried to address it by conducting more interviews with individuals of lower SES with my research assistant who is Egyptian (see the Research Assistant/Interpreter Section below), during two days of my fieldwork. In some cases when interviewees only spoke Arabic or had little knowledge of English, other individuals helped me to communicate with them. This mainly pertains to the agricultural value chains component of this thesis, as the urban agriculture component mostly relies on interviews I conducted with NGOs employees and local experts, all of whom speak in French or English.

Despite this language barrier, I also noticed differences in the extent to which individuals of lower and higher SES would share information. This difference was particularly stark between *Organic farmers* versus *Conventional farmers* (see Chapter 6). Organic farmers and individuals of higher SES appeared to be more inclined to share their experiences and to speak about their livelihoods.

[11] However, even communications in the French language involved challenges: it appears that Lebanese people learn and are only used to Metropolitan French, due to France's historic ties to the region with the Christians, and therefore seemed to have had little contact with French accents. This sometimes required me to speak slowly, to utilize a “international French” accent, or to periodically switch to English.

However, I found conventional farmers and individuals of lower socioeconomic status were generally less enthusiastic to discuss their livelihoods as in their view, their daily lives were not important or worth discussing. This apparent reluctance of conventional farmers to share their experiences is associated with the fact that Lebanese society sees the agriculture sector negatively, and considers it a lesser activity that is not being valorized by the government.

For example, one agricultural science graduate told me about the disdain people express when he tells them about his field of study. More revealing was the discussion my research assistant had with a man that seemed to be of high SES in Souk Jana Loubnan while we were at a table and I was taking notes. This person revealed that his motivation to come at the market was to support local producers to prevent additional rural exodus, claiming that the urbanization of rural towns and regions was part of an effort to mitigate rural migration. When my research assistant confronted him on his solution and asked him about agriculture, he declared he did not care about agriculture, and expressed that he simply did not want more rural people migrating to Beirut.

As farmers do not feel their work is valorized, it came as a surprise to many that a foreigner was interested in what they were doing, their experiences, and their hardships. This sometimes triggered some mistrust. However, in most cases people were prepared to share their experiences, thanks partly to the identity of my research assistant (as I further detail in the next section). In some instances, people did not seem to realize that I was interested in learning about their experiences, probably due to the lack of valorization of agriculture in Lebanese society, which made it harder to learn about their lives.

In conclusion, this section addresses some of the biases I had during my fieldwork. Those biases were mainly due to my positionality and language barriers. However, those biases do not affect the validity of my results as I was conscious of my biases and adjusted my perceptions to present an accurate representation of Lebanese society.

Research Assistant / Interpreter

My research assistant played an important role in the conduct of this research and in the collection of data. Therefore, her positionality and agency are important to take into consideration (Turner, 2010). This is especially important as my research assistant's aid was essential aid to speak with individuals of lower socioeconomic status and thereby make sure that I encountered I wider range of informants than I could achieve alone. She also provided context to data we gathered.

The research assistant I worked with, Nahla[12], is an Egyptian student who got a study grant at the American University in Beirut (AUB) and has lived in Lebanon for four years. Her strong linguistic skills in English and Lebanese Arabic, her capacity to understand my accent easily and her strong interpersonal skills made her a great research assistant and interpreter. Her background in qualitative methods and gender studies were good assets during interviews and she could provide input on gender norms and relations at play during research encounters. Her Egyptian identity was also surprisingly helpful during conversational interviews, as it made for an excellent icebreaker. This was especially useful as it helped to foster trust between the interviewees and ourselves , particularly so at the Sin el Fil wholesale

[12] Nahla authorized me to mention her real name in this thesis after I told her that this document would be available publicly once completed.

market, where most workers were Egyptian and unaccustomed to answering questions.[13] She played an important role in helping me conduct 9 conversational interviews related to fruit and vegetable value chains, among the 36 interviews I achieved in total, and was with me during 2 days altogether. We worked collaboratively, as I decided where to go and how to adjust the conservation after she briefed me after each interview.

At first, we planned that Nahla would only translate my interview questions and the interviewees' answers. However, this *modus operandi* proved to be unsuccessful, as the participants were not at ease with this type of conversation and were less inclined to share information. In order to create a more favorable context for discussion, my research assistant and I agreed that I would tell her the discussion themes, so she could hold informal conversations with the individuals without having to translate continually. Once the conversation was over, she would translate everything that was said. If necessary, I would ask her to ask the interviewee to specify some details of what they said. This approach was beneficial as it put the interviewees more at ease and allowed for unstructured conversational interviews that yielded rich data.

During the fieldwork, Nahla was not with me regularly as the lack of scheduling in conversational interviews made it hard to justify keeping her being with me for an entire work-day. Therefore, given her work schedule, she accompanied me during two weekends. This was seldom an issue as most farmers' markets are typically open during the weekend. During the fieldwork process, Nahla first accompanied me to the Souk Jana Loubnan to

[13] Most agricultural workers in Lebanon used to be Egyptians. Personal networks and employers facilitate their arrival in Lebanon, often based on recommendation of acquaintances, under the kafala system (a system used in the Middle East to monitor migrant workers) (Jureidini, 2010). The situation however changed with the Syrian civil war (2011-Present) as increasing numbers of Syrians, and Iraqi refugees to a lesser degree, end up working in the Lebanese agricultural sector, where they are considered a cheaper workforce than Egyptians. However, workforce in wholesale markets remains predominantly Egyptian.

interview merchants. This was quite useful as the merchants, all from rural areas, only spoke Arabic. We conducted most interviews with women, given the positionalities of my research assistant and I, and my aim to empower women by taking their experiences into account. In one case, the presence of my research assistant/interpreter created an interesting dynamic. The president of a farmers' cooperative spoke French. I therefore began to speak to her in French while my Nahla began to speak to her colleague in Arabic. This allowed my research assistant to gather interesting insights about the challenges that the women members of the coop faced when processing their agricultural products. I would not have been able to obtain such information otherwise as the president would have monopolized the discussion by detailing her organizations' achievements in helping refugees.

Nahla later accompanied me for a visit at the Sin el Fil wholesale market, with the aim to learn about how the market operated. In that case, the Egyptian identity of my research assistant simultaneously acted as a barrier and as an advantage. Being two foreigners unknown to the workers,[14] we looked out of place, which made it hard at first for us to speak to them (Clifford, 1998). On the other hand, her identity served as an advantage, as being Egyptian and able to communicate in colloquial Egyptian Arabic made her relatable to the workers and helped to lower mistrust. However, there was still some mistrust as the workers were not entirely convinced of our purpose.

We planned to conduct a last series of interviews by the end of my stay, mostly to validate the data I had already gathered. I wanted to speak to corner store owners and perhaps one of the rare street sellers I encountered. Unfortunately, due to unforeseen events and constricting schedules, this last series of interviews was cancelled.

[14] Wholesalers know their regular customers, as one of them told us.

My research assistant/interpreter with her strong interpersonal skills and background in gender studies proved very helpful in helping me gather more information on individuals of lower socioeconomic status and to correct some biases I had as a researcher.

Methodology

Data Collection

Sampling

During my two months-long field research, I used a purposive sampling strategy to identify interviewees. Purposive sampling is a non-probabilistic sampling strategy in which the researcher selects interviewees based on who is appropriate for the study (Battaglia, 2008). I used two different sets of sampling criteria to select interviewees for the two components of my research; one for urban agriculture and another for agricultural value chains. For the urban agriculture component, my sampling criteria emphasized individuals that had an earlier experience with an urban agriculture project. For the agricultural value chain component, my sampling criteria targeted anybody involved in agricultural value chains for fruits and vegetables. I tried to balance the numbers of *Organic farmers* and *Conventional farmers* (see the Result section) interviewed to have a more accurate depiction of reality. I regularly shifted my attention between various individuals throughout fruit and vegetable value chains to obtain a more comprehensive view of their functioning and influences upon various actors' vulnerability context.

In this regard, I also utilized theoretical sampling for the fruit and vegetable value chain component, in which the sample is built in an iterative process. As the research progresses, the sampling is further defined and refined to fill in knowledge gaps (Charmaz, et al., 2012).

Interviews

I collected data through two means; namely unstructured interviews and conversational interviews. Unstructured and conversational interviews are often understood as synonyms, but in this thesis, I distinguish them as two distinct methods (Zhang, et al., 2016). For the purpose of this study, unstructured interviews consist of interviews I conducted in an organized/planned setting, whereas conversational interviews consist of discussions that occurred in a spontaneous/unplanned setting (Firmin, 2008; Gall, et al., 2003; Roulston, 2012).

I completed the investigation on urban agriculture through individual unstructured interviews with key local informants. Unstructured interviews focus on local knowledge, as the interviewer guides rather than controls the discussion, allowing individuals to share their knowledge and thoughts more freely (Robertson, et al., 2003). This method allows outsiders to learn more about the ways in which individuals and communities use and manage their resources and yields in-depth analyses of issues and problems pertaining to resource consumption (Firmin, 2008). A list of themes acted as a guiding framework for the discussions. Most of the time, I wrote the sets of themes in rough question form (see ANNEX I). Those themes evolved slightly between interviews in order to account to the roles of individual interviewees and their implications in an urban agriculture project. The themes covered different aspects of vulnerability associated with urban agriculture and addressed issues such as water supply challenges, cost and space requirements, and vulnerability to the impacts of climate change.

When speaking with farmers involved in different fruit and vegetable value chains, I relied on conversational interviews. Conversational interviews aim to create a casual

atmosphere in which the interviewee is free to speak, allowing them – as with unstructured interviews – to share their knowledge and thoughts (Robertson, et al., 2003; Roulston, 2012). It is driven by "spontaneous generation of questions in a natural interaction, typically one that occurs as part of ongoing participant observation fieldwork" (Gall, et al., 2003 p. 239). In my case, the conversational interviews were slightly structured as I kept a mental list of themes from earlier discussions. This method allowed me to stay more flexible as I could ask new questions or change my original ones based on previous interactions, giving me some degree of freedom to gather information about their livelihoods, challenges and clients.

In total, for my urban agriculture investigation I conducted six unstructured interviews. I was not able to access anyone that participated in an urban agriculture project (as none were active at this stage), and I could only interview NGOs employees, volunteers and local experts. The sample nonetheless proved to be satisfactory as interviewees quickly corroborated each other, suggesting that I had reached saturation (Guest, et al., 2006). As for the value chain component, I conducted conversational interviews with 36 individuals in total, along with numerous observations. Among these interviewees, I met 14 *Organic farmers* (see Chapter 6), as they were generally more accessible, more willing to share information, and could usually speak either French or English. While *Conventional farmers* are fairly well represented, (Table 1)[15] a number of *Organic farmers* were formally *Conventional farmers* as well, so they could share their experiences from before and after they became *Organic farmers*.

Table 1 Breakdown of the interviewees for the agricultural value chains component of the research

Interviewees	**Number**
Conventional Farmers	6
Organic Farmers	14
Wholesalers	4
Processors	6
Experts or NGOs employees	6

[15] While I spoke to eight *conventional farmers,* two of the discussions did not yield any results (hence why I am not counting them).

Figure 3 Example of recorded observation illustrating the narrowness of Bourj Hammoud's streets. The lack of light on balconies suggests that this is not an ideal setting for urban agriculture

Observation

Along with unstructured and conversational interviews, I acquired data through non-participant observation. While undertaking non-participant observation, researchers aim to minimize the impact of their presence on research participants' behaviours. Inputs gathered by observation allow the researcher to develop schemas and to organize information about a specific society and individuals (Gray, 2014). The observations I made in the field were direct observations, where I gathered data by looking at my surroundings while acting as a local. I focused my observations mainly on the infrastructure, the price of fruits and vegetables sold in supermarkets and corner shops, the means of transaction, the fruits or vegetables boxes traded, and presence of delivery trucks. I noted the observations, and sometimes recorded them by taking pictures (see Figure 3 for instance)[16], and analysed these data using a coding process similar to the one I used for the interviews, as explained below.

Data Analysis & Coding

Conducting unstructured and conversational interviews drove me to adopt a grounded theory methodology, which is a hypothetico-deductive approach. Grounded theory is a research methodology in which the researcher systematically gathers, analyses and codes the data throughout the fieldwork. Thus, collection, analysis, and interpretation of the data evolve continuously during the research as the researcher's understanding of the research subject develops (Strauss, et al., 2008).

Grounded theory allows "researchers [to] approach the question with disciplinary interests, background assumptions and an acquaintance with the literature […], the theory emerges through a close and careful analysis of the data" (Lingard, et al., 2008 p. 567).

[16] All faces in pictures in this thesis will be blurred to preserve anonymity in accordance to my ethic review.

This approach allowed me to be flexible towards emerging research topics, and to adjust my focus as my understanding of my research subject became more nuanced. This approach also allowed me to focus on local knowledge, as continuous coding relies on the acquisition of data in the field. The methods I used for organizing and coding data are explained below.

I took notes following numerous steps. After conducting conversational interviews, I would write down keywords and key information in bullet point lists. I drafted my notes in places where I could sit and write without being disturbed. Sometimes I could take notes right after the conversation, for instance when interviews were done in public markets or space or at the American University of Beirut (AUB). I aimed to minimize the delay between the interview and the moment when I would take notes. Otherwise, I would take notes in one of Beirut's rare green spaces or at my apartment; depending on which location I was nearest to. For critical information, I made a quick note on my phone. That allowed me to retain valuable information without taking notes in my notebook, which I know influenced my how other people behaved.

Later in the day, I would rewrite key points with complete sentences and add details or context to them. I usually completed this time-consuming task in my apartment. It was often in this second transcription of the results that I would code and single out the themes of the discussion. I finally noted answers of the interviewees in 'more formal' interviews, such as those I carried out with NGO employees for instance[17]. I only recorded interviewees'

[17] In one case, note taking during a conversation was also possible as I sat in the car with the interviewee while he was driving me to a wholesale market.

answers in bullet points and did not audio tape them because I wanted the interviews to remain informal conversations. I thereby have very few direct quotes to refer to in this thesis.

I created themes when they were central discussion points that people referred back to numerous times. I applied newly created themes retroactively on previous conversations so as to categorize comments I had not yet coded. Those uncategorized comments often related to issues the interviewee had not focused on specifically, but that nonetheless corroborated arguments brought up by other interviewees.

In conclusion, I gathered my data through: unstructured interviews for the urban agriculture component of this thesis; conversational interviews for the agricultural value chain component; and observations. I noted the data I collected, first in bullet-point form and later transcribed in text form. I followed the grounded theory methodology to collect the data, and I analysed the data by looking at the main themes of the interviews.

Chapter 3: Conceptual Framework

In order to assess the determinants of vulnerability of urban agriculture practitioners and farmers partaking in agricultural value chains, my theoretical framework builds upon three core conceptual approaches often emphasized in agricultural studies: vulnerability, sustainable livelihoods approaches, and value chain analysis (Ellis, 1998; Fernandez-Stark, et al., 2011; Gerber, et al., 2014; Maachou, et al., 2016; Marsden, et al., 2002; Paavola, 2008; Zimmerer, 2007). This combination is meant to help me determine to what extent urban agriculture is viable in Lebanon and to what extent agricultural value chains for fruits and vegetables influence farmer livelihoods (Figure 4). These three bodies of literature also connect my research to the literature on agrarian livelihoods (Evans, 2008; Halberg, et al., 2012; Zimmerer, 2007). The determinants of vulnerability are the core focus of this research. The sustainable livelihoods approaches shape my analysis of the capacities and assets that individuals have at their disposal as they practice conventional agriculture and urban agriculture. Finally, value chain analysis probes the various processes and actors influencing farmers' livelihoods. I only use this last conceptual element in the agricultural value chain component since it is not relevant for the urban agriculture section. I further define each conceptual approach below.

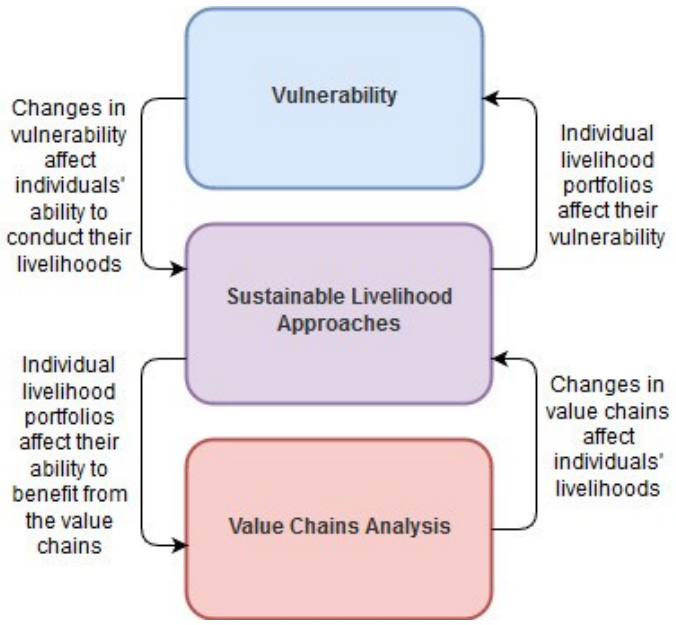

Figure 4 The conceptual framework I used in this paper, showing the relationships between each concept. The figure only represents the general framework of this thesis and each aspect is further illustrated in its respective subsubsection.

Vulnerability

The first concept I explore in my conceptual framework is vulnerability. Literature on vulnerability mostly emanates from climate change studies, as the Intergovernmental Panel on Climate Change's (IPCC) use of the term made it central to climate change research (McCarthy, 2001). Thus, many elements of the vulnerability framework come from this agenda (Füssel, et al., 2006). Although I do not focus specifically on the impacts of climate change on farmers' vulnerability, the vulnerability framework is relevant for assessing their vulnerability beyond climate change, as this approach can be applied to any stress experienced within any socioecological system (Adger, 2006). Vulnerability is understood as a "state of susceptibility to harm from exposure to stresses associated with environmental and social change and from the absence of capacity to adapt to climate change" (Adger, 2006 p. 268). Vulnerability is the degree to which a socioecological system is susceptible to change, stresses or shocks, and is unable to cope with the adverse effects (McCarthy, 2001). In other words, vulnerability defines the measure of a population's susceptibility to climate, environmental and social changes and reflects its adaptive capacity.

Different understandings of vulnerability exist within the literature, including one that frames vulnerability as a function of exposure, sensitivity and adaptive capacity (Adger, 2006; Turner, et al., 2003).[18] Exposure consists of the nature and degree to which people, livelihoods, social, economic and cultural assets can be affected by environmental or sociopolitical stresses and shocks. Sensitivity consists of the degree to which socioecological

[18] Scholars distinguish between social and environmental vulnerability, although this debate falls outside of the scope of this research. Climate change scholarship also focusses on the notion of resilience, arguing that socioecological systems are complex and characterized by thresholds beyond which a system's equilibrium is being re-organized (Mathevet, et al., 2014). However, in the context of this paper, the focus has been put on the concept of vulnerability rather than resilience.

systems can be affected, either adversely or beneficially, by such changing conditions. Finally, adaptive capacity consists of the ability of socioecological systems, institutions and people to adjust and adapt to the impacts of those changing conditions, “to take advantage of opportunities, or to respond to consequences” (IPCC, 2014 p. 118).

The interpretation of vulnerability I use in this thesis slightly differs from the literature presented above. The IPCC approach is an endpoint one, also known as outcome vulnerability (O'Brien, et al., 2007). It therefore considers vulnerability as “the end point of a sequence of analyses beginning with projections of future emission trends, moving on to the development of climate scenarios, and thence to biophysical impact studies and the identification of adaptive options” (Kelly, et al., 2000 p. 326). While this approach has its merits in climate change studies, it is less relevant in the context of this research, which focuses on present vulnerabilities within urban agriculture and fruit and vegetable value chains. Therefore, this research adopts the starting point approach, or contextual vulnerability, which focuses on present inabilities to cope with changing environmental and social conditions (O'Brien, et al., 2007). This framing offers a multidimensional view of vulnerability that takes the complex nature of agricultural work into consideration, and better understands the myriads of contextual elements that make agriculture, whether conventional or urban, vulnerable. Thus, “contextual vulnerability” takes into account different causes of present vulnerability (Figure 5).

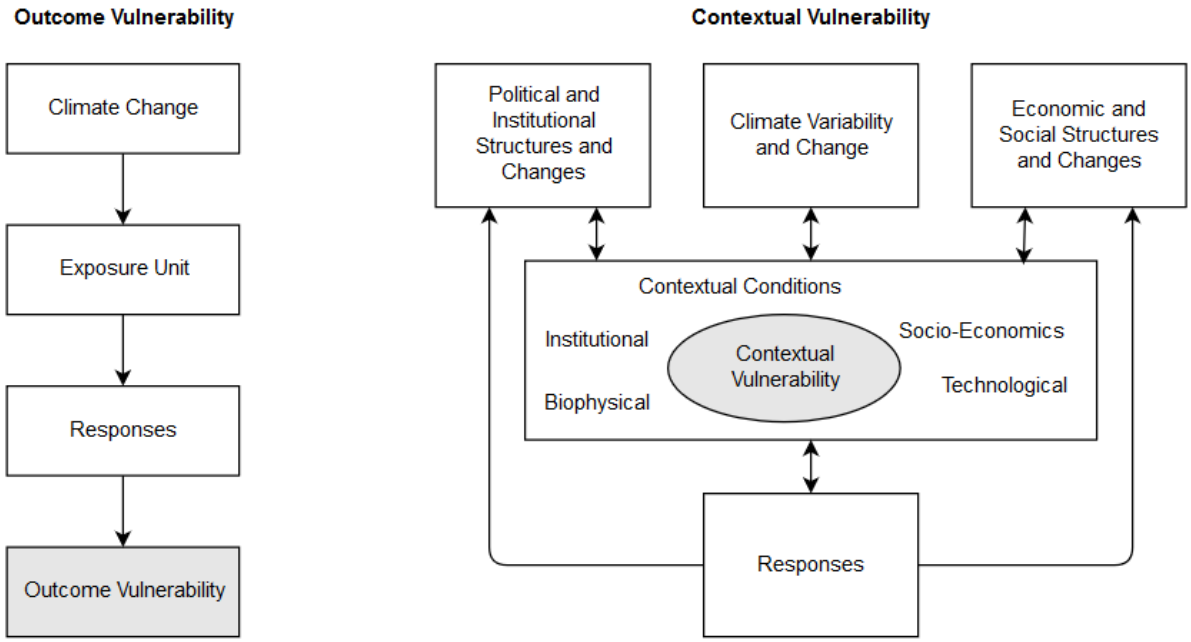

Figure 5 Frameworks depicting "outcome vulnerability" and "contextual vulnerability" interpretations of vulnerability. Source: O'Brien, et al., 2007 p.75

Within agricultural value chains, vulnerability challenges farmers' level of adaptability in the wake of changing prices, distribution patterns, supply and demand, and climate. All farmers are vulnerable to conditions that affect their crops and their ability to sell them. However, sensitivity to these conditions varies as the "producers' ability to adapt or cope with these risks varies depending on such factors as the availability of resources and technology, and access to government programmes" (Belliveau, et al., 2006 p. 364). This shapes farmers' adaptive capacity and dictates how climate change and environmental degradation impacts agricultural value chains, and ultimately affects their livelihoods. Farmers' ability to adapt, moreover, varies depending on the availability of resources, type of training, and development programs (Belliveau, et al., 2006).

Vulnerability and livelihoods are closely connected, as the stressors employed in the vulnerability framework are also emphasised in the livelihood framework (Paavola, 2008). Hence, access to specific livelihood assets has major implications on individuals' vulnerability.

There is a need to understand how farmers experience and adapt to environmental changes such as increased water stress. In Lebanon, water stress can cause water shortages, and ultimately increase production costs and diminish yields. Climate change could also reduce the comparative advantages that coastal farmers enjoy, being able to cultivate their field year-round. Farmers in the mountains or in the Bekaa valley cannot cultivate during the winter, but temperature rises may lead to the extension of the farming period in non-coastal areas (Saadi, et al., 2015; Verdeil, et al., 2014). This extension would affect the revenues from coastal farmers during the non-coastal area off-season, and their ability to maintain agrarian livelihoods in a context where they deal with growing urbanization pressure (Tawk, et al., 2014). The ability of farmers to adapt to such economic and environmental change depends of the range of livelihood assets that they can mobilize and the livelihood strategies they can deploy (Adger, et al., 1999).

Sustainable Livelihood Approaches

Sustainable livelihood approaches are the second component to my conceptual framework. Livelihoods are understood as the capabilities, assets (human, natural, financial, social, and physical) and activities required to make a living (Chambers, et al., 1991; DFID, 1999; Sen, 2001). Livelihoods were originally understood from an economic standpoint and defined as the set of economic activities and resources required to make a living. This is a narrow definition that does not consider other key aspects such as non-financial assets, vulnerability and social exclusion, and is contested by certain scholars from the sustainable livelihoods tradition (Chambers, 1995; Rigg, 2007). The sustainable livelihoods approach integrates five capitals: human (education, skills, knowledge), natural (the natural resource pool, biodiversity), financial (savings, credit, cattle), social (social networks, contacts,

acquaintances, belonging to a group), and physical (farm equipment, production tools) (Ellis, 1999). Those assets impact the abilities of a household or individual to earn a living and maintain or enhance its livelihood, and to cope with livelihood stressors (Ellis, 1999). In other words, "assets form building blocks of sustainable livelihoods, impacting household capacity to withstand challenges of shocks encountered in improving livelihoods" (Nkala, et al., 2011 p. 761). Assets are influenced by the context in which they are in (as described by contextual vulnerability), whether political, economic or environmental, and may produce different livelihood outcomes (Figure 6).

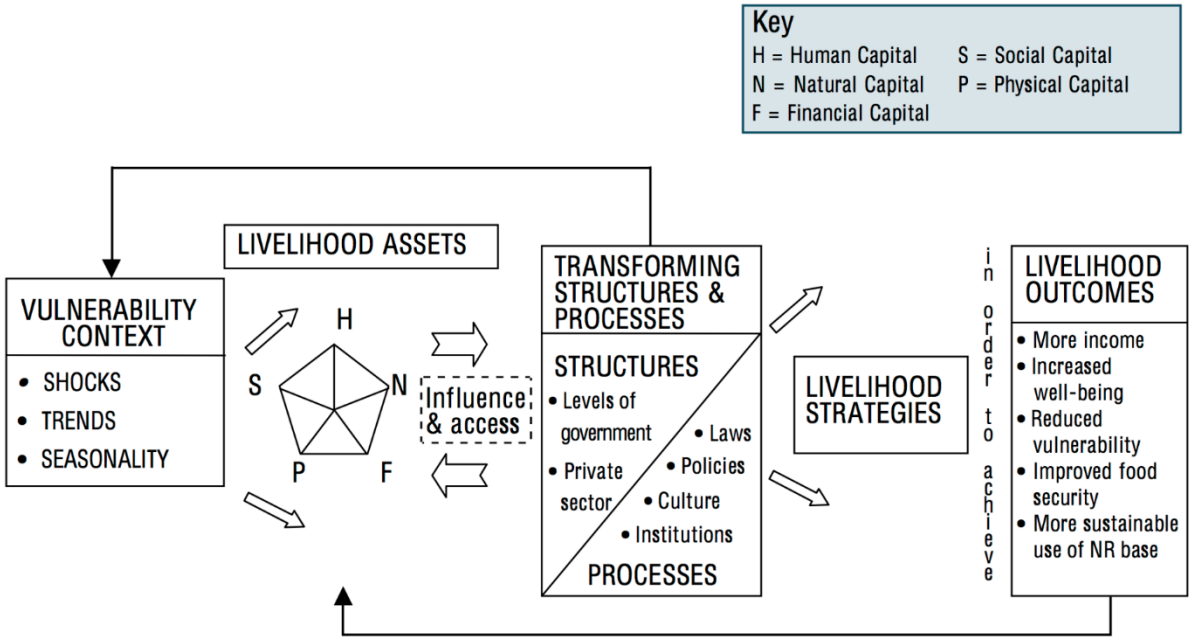

Figure 6 Link between livelihood assets and livelihood outcomes. Source: DFID, 1999 p.2

Human capital plays a central role in the farming sector – either conventional or urban – as it plays a central role in farmer's ability to sustain their livelihood (Bingen, et al., 2003). Varying areas of knowledge and training limit farmers to specific sets of agricultural activities. Human capital dictates farmers' occupational choices, what inputs they use and, ultimately, their incomes. For instance, urban agriculture requires a different set of human capital assets than conventional agriculture, given that UA occurs in complex urban settings and that having

specific technical knowledge is critical for undergoing urban agriculture (Prain, 2006; Prain, et al., 2007).

In the context of agricultural value chains for fruits and vegetables, social capital also plays an important role as it helps individuals to create meaningful social networks that can allow them to enhance their economic opportunities (Granovetter, 2005). Integrating key aspects of social concepts such as trust and social networks, which are at the basis of wholesale activity, facilitate a better understanding of farmers' livelihoods as "social capital focuses on the resources embedded in one's social network and how access to and use of such resources benefit the individual's actions" (Gerber, et al., 2014; Lin, 2001 p. 55). Social capital also allows farmers to benefit from kinship-centred support mechanisms (Ellis, 1998; Sissoko, et al., 2011). This notably manifests when geographically and socially close farmers get involved in cooperatives in order to benefit from a form of agricultural insurance that is not provided by the State.

My focus in this thesis is mainly on human and social capital as these are central to explain vulnerability of urban agriculture practitioners, in improving farmers' livelihoods, and in assessing agricultural value chains (Bingen, et al., 2003; De Bon, et al., 2010; Ellis, 1999; Fernandez-Stark, et al., 2011; Gerber, et al., 2014; Mougeot, 2005; Prain, 2006; Qiao, et al., 2013; Scoones, 2009). Nevertheless, the other livelihood capitals also play a role in assessing the vulnerability of urban agriculture practitioners. Physical capital dictates the ability to practice urban agriculture by having access to the necessary infrastructure, seeds, fertilizers and farming equipment, determining farmers' ability to enhance or diversify their livelihoods (De Bon, et al., 2010; de Zeeuw, et al., 2017). Financial capital dictates farmers and urban

agriculture practitioners' ability to benefit from physical capital, and natural capital limits how much they can produce (De Bon, et al., 2010; Evans, 2008; Prain, 2006).

The vulnerability context is a component of the sustainable livelihoods approaches, and refers to the seasonality, trends and shocks influencing individuals' livelihoods (DFID, 1999). These vulnerability factors are understood as a function of exposure and sensitivity as the vulnerability approach and affect individuals' livelihoods (DFID, 2000). Any change in vulnerability or access to resources has a direct incidence on one's ability to maintain their way of life. If an individual or a household's livelihood is not able to cope with much pressure and frequent shocks, its ability to access assets and capabilities is hindered, which in turns jeopardises its ability to maintain current livelihood conditions (Adger, et al., 1999). Furthermore, if the availability of natural resources becomes scarce, livelihoods are threatened (DFID, 1999; Ellis, 1999).

Value Chain Analysis

The third component of this conceptual framework is the value chain analysis approach, which relates to the notion of social capital I addressed above. Value chain analysis (VCA) consists of the analysis of the whole range of activities necessary to bring a product to the consumer (Kaplinsky, et al., 2000). Another approach for studying value chains is the global value chains (GVC) analysis, which is more widely documented. GVC analysis centres on how actors interact with and insert themselves within the global economy (Gereffi, et al., 2016). As my thesis mostly focuses on social interactions at the local level, I emphasise VCA rather than GVC. Furthermore, in GVC literature, vulnerability assessments center on factors such as supply chain stability, commodity supply, location and availability, all of which do not correspond to how I approach the concept of vulnerability in this thesis (Bogataj, et al., 2007).

VCA is a two-headed notion, being both a methodology and a conceptual approach. First, as a methodological approach VCA represents the process through which one maps a whole value chain (Taylor, 2005). Second, as a conceptual approach, VCA segments the different processes that generate cost or value in value chains (Webber, et al., 2010).

VCA helps to determine how farmers operate in complex socioeconomic networks where vertical and horizontal interactions between all the nodes of the chain dictate the range of activities and outcomes available for the farmers (Webber, et al., 2010a). In this context, agricultural value chains refer to the full range of activities required for an agricultural product to move from farmers to consumers (Figure 7). VCA examines the earnings from different actors partaking in the supply chain, and the factors shaping profit distribution (Anandajayasekeram, et al., 2009; Fernandez-Stark, et al., 2011; Kaplinsky, et al., 2000).

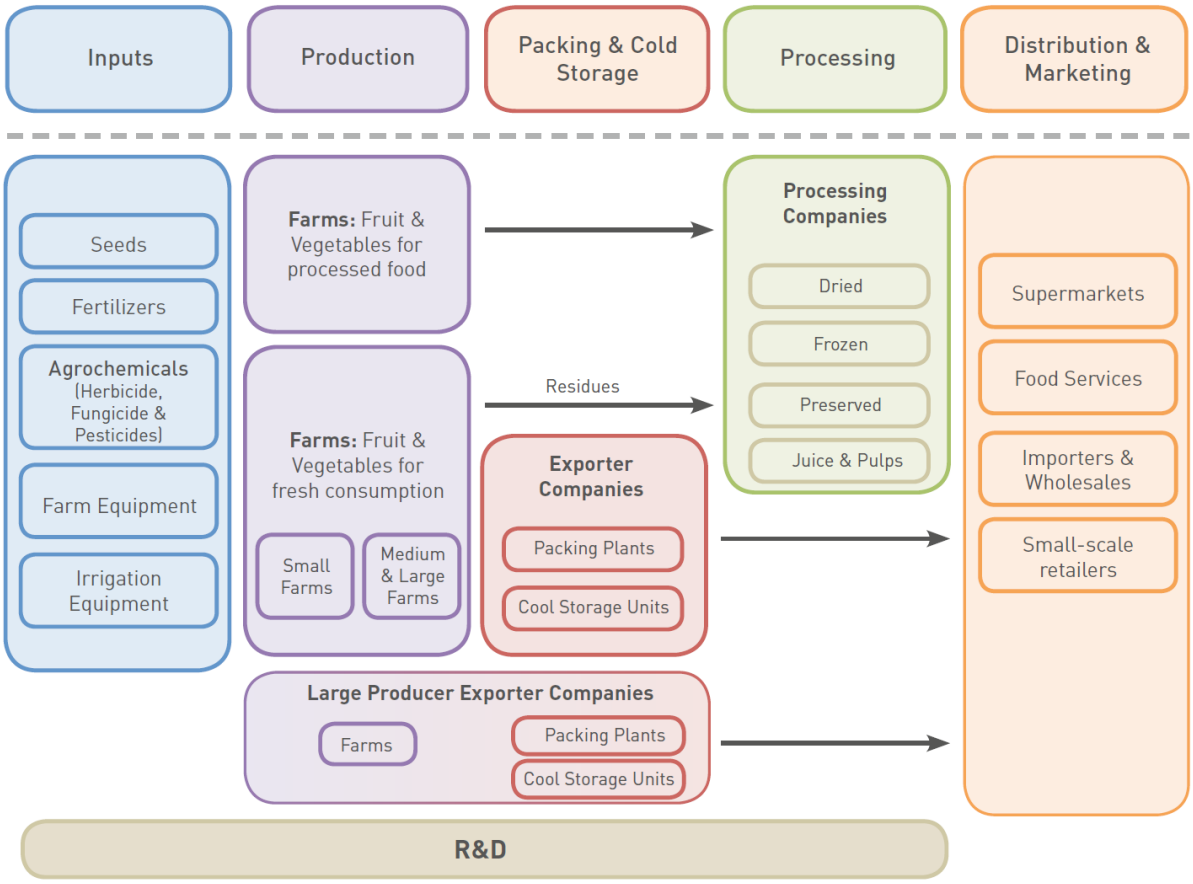

Figure 7 Representation of an agricultural value chain. Consumers are not shown. Source: Fernandez-Stark, et al., 2011 p.22

According to Kaplinsky et al. (2000), VCA includes three key elements, namely; barriers to entry and rent; governance; and different types of value chains. Barriers to entry and rent encompass the attributes and innovations that allow some actors to distinguish and protect themselves from competition. In the context of agrarian value chains, the cost of farming equipment and regional seasonal tariffs count among such barriers (Fernandez-Stark, et al., 2011; Kaplinsky, et al., 2000). Governance represents the power relationships that exist within an industry and coordinates interactions between different nodes of the value chain to ensure smooth interactions. Governance can be overseen by actors in the value chain, or by external parties like governments (Kaplinsky, et al., 2000). Finally, types of value chains refer to two models of value chain governance. First, a value chain can be 'producer-driven'. In this model, large manufacturers usually play a central role in coordinating centralized production networks, most often in knowledge-intensive industries. Second, 'buyer-driven' value chains are those where retailers play pivotal roles in coordinating decentralized production networks (Gereffi, 1999). The global fruit and vegetable sector is a buyer-driven one (Gereffi, et al., 2009).

VCA is connected to the sustainable livelihoods approaches and vulnerability. VCA heavily draws on social, human, natural and financial capitals to analyse how social relations unfold in value chains. Actors' assets also affect their ability to benefit from the value chains, and thus their ability to sustain their livelihoods and reduce their vulnerability. Any modification in the agricultural value chains involves consequences on the livelihoods of farmers, and thus upon their vulnerability.

In conclusion, my theoretical framework centers on the concept of vulnerability, on sustainable livelihood approaches and on value chain analysis. This theoretical framework

allows me to assess the extent to which the specific NGO-sponsored UA projects that the thesis focusses on are viable or not in Lebanon. Furthermore, this theoretical framework also allows me to assess how fruit and vegetable value chains influence farmer livelihoods. Sustainable livelihood approaches allow me to evaluate the assets required for the sustainable practice of urban agriculture as the ability to practice urban agriculture will in turn influence farmer livelihood vulnerability. As for agricultural value chains, VCA assesses how value chains influence farmer livelihoods, which in turn shapes these actors' vulnerability to external shocks and stresses.

Chapter 4: Context

Urban agriculture and agricultural value chains for fruits and vegetables in Lebanon are complex concepts with wide processes dictating many of their internal dynamics. For instance, aspects of urban agriculture in Lebanon, such as lack of space and insufficient training, relate to other urban agriculture projects that happened throughout the Middle East. Likewise, the local agricultural chains are influenced by processes happening in Syria, Egypt and Jordan, including the availability of subsidized inputs and civil war in neighbouring countries. This chapter aims to review the context in which urban agriculture and agricultural value chains are inscribed and introduces background details needed to understand the results (Chapters 5 and 6). First, I contextualize urban agriculture in the Middle East, and second I contextualize fruit and vegetable value chains in Lebanon.

Urban Agriculture

As previously stated in the introduction of this thesis, urban agriculture is quite diverse, and spans every agricultural system within an urban context. Mougeot (2000 p. 11) defines urban agriculture as

> Located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, and grows or raises, processes and distributes a diversity of food and non-food products, (re-)uses largely human and material resources, products and services found in and around that urban area, and in turn supplies human and material resources, products and services largely to that urban area.

Thus, in the classical understanding, urban agriculture can encompass plots of land exploited for agricultural purposes in an urban context. Agricultural fields in urban settings are in part the result of urbanization. Urban development encroaches on farmlands and isolates farmers (Douglas, 2006; Germain, et al., 2006). Urban agriculture entails both practices such as small-

scale food producing activities aimed at personal consumption together with market-oriented activities. Growing a garden on a private property, on balconies and rooftops all count as urban agriculture. In this thesis, unless otherwise stated, I use the expression urban agriculture to refer to farming activities that people undergo on balconies or rooftops for self-consumption purposes.

The literature highlights a strong link between urban agriculture and positive environmental outcomes (de Zeeuw, et al., 2017). Urban agriculture, often relies on recycled resources, household waste, marginal spaces, and promotes rain water collection and storage, therefore reducing consumption on natural resources such as forests, soil and water (de Zeeuw, et al., 2017). This reduced environmental degradation in turn contributes to enhance adaptive capacity towards climate change, as natural resources act as safety nets for vulnerable populations, especially during periods of environmental stress (Paavola, 2008). In the Global South, urban agriculture also contributes to increasing both food security and the nutritional well-being of low-income groups who are the most vulnerable to the impacts of climate change (Maxwell, 1995; Morton, 2007; Mougeot, 2005). Nonetheless, effective governance is a prerequisite for such climate change adaptation strategies to be successful (Paavola, 2008). However, to my knowledge, how the benefits from urban agriculture manifest in Lebanon is not documented.

UA projects mainly brand UA as an adaptation strategy to climatic change, an aspect that is not the focus of this thesis. However, UA projects focused on climate change provide insights relevant to how I approach UA. Mougeot (2005) explains that the role of urban agriculture within climate adaptation strategies remains largely unquantified. Urban contexts vary in terms of size, geographical location, weather, and politics, and all these factors

influence the vulnerability of urban agriculture to climate change. Therefore, a project that yields positive results in a certain context will not necessarily do so in a different location, and this variability requires that project specificities be analyzed extensively (Mougeot, 2005). This applies for non-climate change centred UA projects alike. For instance, Zeeza and Tasciotti (2010) acknowledged that their conclusion to the meta-studies of UA projects could change depending on the local context and environmental variables. These authors found that urban agriculture projects have yielded slight increases in food security in 15 countries (Zezza, et al., 2010). Maxwell (1995) highlights that in Kampala, Uganda, urban agriculture is critical for urban households' food security, especially for women. Although they are responsible to buy food for the household, women are not the main income provider and often rely on their husband to secure sufficient financial resources (Maxwell, 1995). This shows that there is a need to assess the impacts of urban agriculture in different contexts to evaluate its usefulness. This is especially important as most research on the relationship between urban agriculture and food security focuses on a limited number of countries, most of which are located in sub-Saharan Africa (see for instance: Magigi, 2013; Paavola, 2008; Robineau, 2015).

Moreover, urban agriculture breeds a wide range of challenges for those who practice it. Among those challenges, some impede individuals' assets. For example, pest attacks, adverse weather conditions and the lack of clean water for irrigation act as limitations in natural capital. The lack of space in crowded urban settings is a significant limitation to physical capital. Thus, limitations to natural and physical capital, combined with limited knowledge about urban agriculture and limited training, increase urban agriculturalists' vulnerability (Magigi, 2013).

Middle Eastern scholars have argued that urban policies often create burdens for urban agriculture projects (Redwood, 2004; Sowers, et al., 2011). Urban planners and specialists often fail to acknowledge the positive outcomes from urban agriculture and typically enforce prohibitive urban agricultural policies and regulations (Redwood, 2004; Sowers, et al., 2011). Available case studies include reviews of rooftop agriculture projects in Amman, Cairo, and Gaza. Each of these projects emphasized different objectives and aims, and promoted different farming systems, as discussed below. Yet similar to the projects I study in this research, these projects had targeted low and middle-income populations, and all failed to achieve self-sufficiency after sponsor organizations retreated.

The Amman project, developed by the Environment and Sustainable Development Unit (ESDU) of the American University of Beirut (AUB) and the Resource Centres on Urban Agriculture & Food Security (RUAF) Foundation, was an experimental rooftop garden initiative with a wastewater treatment dimension that began in 2013. In 2016, the rooftop garden provided participating households with 10 percent of their fruits and vegetables, allowing annual household savings of 250 JOD (USD 330) (Surani, 2003; de Zeeuw, et al., 2017). The project's main aim was to identify the most efficient method to recycle greywater within urban agricultural projects unfolding in an arid climate context. Therefore, the urban agriculture aspect was just a side component to the main objective of enhancing used water treatment. The project targeted middle-income individuals. These individuals were favoured because they could afford to attend training classes on urban agriculture (Surani, 2003; Tawk, et al., 2014; de Zeeuw, et al., 2017).

Also led by the RUAF Foundation, the Cairo project was a rooftop farming project targeting low-income populations. The project aimed to analyse how rooftop farming could

help in building climate change resilience (Dubbeling, et al., 2014). Simple hydroponic systems were installed, with the aim to allow farmers to sell their crops and gain supplemental income, but there was no increase in food security. RUAF conducted the initiative for one year, after which the 7 Up Company became involved in the project as it had become a component of its corporate social responsibility agenda (de Zeeuw, et al., 2017). Due to the short duration of the project, little information is available on its impacts on climate change vulnerability. The main benefit identified was the positive role of urban agriculture in adding green cover and in reducing an urban heat island effect (Dubbeling, et al., 2014; de Zeeuw, et al., 2017).

The Gaza project targeted low-income communities and involved the FAO-sponsored installation of advanced aquaponic[19] food production systems. It aimed to increase food security and improve nutritional health. The low-income communities that were involved benefited from substantial rises in food input, and their nutritional health was indeed enhanced. However, this project was expensive and could only sustain itself through UN financing. When the project was completed, the low-income communities involved at first continued to use the aquaponics installations. However, high input and maintenance costs forced people to stop using these installations after they broke (de Zeeuw, et al., 2017).

The above literature highlights that urban agriculture can foster food security among low-income groups in developing countries. However, urban agricultural projects yield different benefits in different contexts, and how these outcomes manifest in Lebanon remains understudied. Case studies in the Middle East indicate that urban agriculture can enhance

[19] Aquaponics is a form of hydroponics which combines farming and aquaculture. This approach allows creating for a symbiotic relationship in which the discharges of farmed fish serve as fertilizer for the plants and the plants provide water treatment. This allows for a reduced water usage, as water is being recirculated in a closed-circuit, while providing higher yields.

low-income populations' food security if projects are sufficiently adapted to target those populations.

Fruit and Vegetable Value Chains

Available information on fruit and vegetable value chains in Lebanon mostly analyses fruit and vegetable export value chains (CBI, 2016). Literature on agricultural value chains in 'developing countries' primarily focuses on how to increase their agriculture competitiveness in the global market by looking at the final segments of value chains such as export distribution. This focus, however, overlooks the middle segments of agricultural value chains and the livelihoods of the actors implied in those, such as processing, logistics and wholesale, which account for 30 to 40% of the total costs and added value in agricultural value chains (Reardon, 2015).

Some reports have analysed the actors, supporters and influencers that partake in local agricultural value chains in Lebanon (CBI, 2016; ESCWA, 2013; USAID, 2014). 'Actors' consist in the private stakeholders who are involved in the value chain. 'Supporters' refer to stakeholders that assist the value chain in a commercial (suppliers, providers) or institutional (education) way. 'Influencers' are stakeholders from the institutional environment who influence the overall management of agricultural value chains (CBI, 2016). The following subsections further detail how these categories manifest themselves in the context of agrarian value chains in Lebanon (Figure 8).

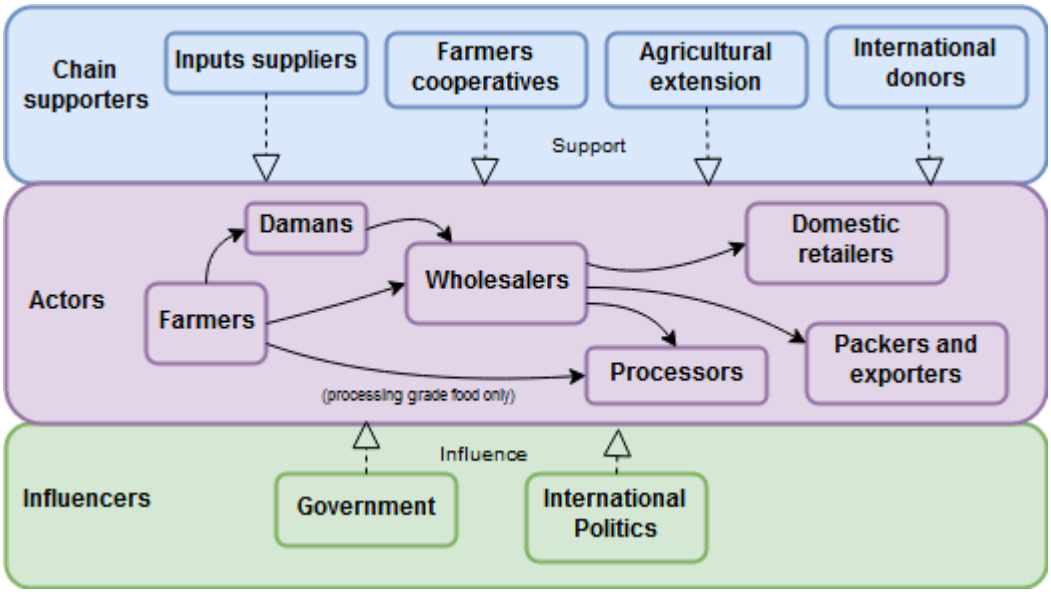

Figure 8 Illustration of the nodes involved in agricultural value chains for fruits and vegetables in Lebanon [Own interpretation of (CBI, 2016)*]*

Actors

The first actors in the chain are the **farmers** ranging from small to large in size. In 2010, 170,000 farmers cultivated a total area of 231,200 ha in Lebanon[20] (Ministry of Agriculture, 2014). Some large or medium scale farmers can act as brokers, called 'daman', within a specific area where they buy the production from some small and medium-scale farmers (some damans are only involved in trading). Damans buy fruits and vegetables at a price 15 to 25% below wholesalers' prices, but they handle crop harvesting and transportation between production sites and wholesale markets (USAID, 2014).

Lebanon's nine **wholesale markets** serve as central nodes in national fruit and vegetable value chains, as this is where most agricultural productions are gathered, sold and dispatched throughout the country (CBI, 2016). Wholesale markets located in production regions (such as Akkar and Bekaa) are mostly consignment markets that connect local supply

[20] This Includes farmers involved livestock and crops production. No reliable up-to-date statistics about farmers growing fruits and vegetables solely is available.

with national outlets (CBI, 2016). Wholesale markets are operated privately. Facilities are poorly maintained, price-fixing mechanisms are opaque, and merchants charge a 7-10% commission fee (CBI, 2016). Operations in wholesale markets are based on trust (ESCWA, 2013).

Domestic distributors buy from wholesale markets and distribute to local retailers, restaurants and catering services (CBI, 2016). These actors typically achieve a 10 to 15% markup (USAID, 2014). **Domestic retailers** are also involved in fruits and vegetables retail, while supermarkets are also growing increasingly popular in Lebanon. Ten supermarkets are established in Lebanon, including *Carrefour*, *Spinneys* or *Le Charcutier* (CBI, 2016). **Processors** also purchase from wholesale markets to process low grade and/or substandard fruits and vegetables not adequate for end retail, and from farmers producing fruits and vegetables for processing (CBI, 2016; ESCWA, 2013). Sixty percent of all food processors in Lebanon are small-medium enterprises (SMEs), and these are mainly located in Mount Lebanon, North Lebanon and Beirut (Massoud, et al., 2009).

Intermediaries such as damans, wholesalers and distributors generate the greatest profit along fruit and vegetable value chains and their operating costs remain low, as they maintain limited storage and refrigerators (ESCWA, 2013).

Packers and exporters are not covered in this thesis, and they mostly source their fruits and vegetables from wholesale markets, or from selected producers. They then export these commodities in neighbouring countries (CBI, 2016).

Chain supporters

In this thesis, I document four chain supporters, namely: input suppliers, farmer cooperatives, agricultural education officers and international donors. **Input suppliers** play a

significant role in Lebanon's agriculture, and there are 75 such suppliers registered in the Bekaa valley alone (USAID, 2014). Lebanon's agriculture sector is input intensive, and farmers rely heavily on chemical fertilizers and pesticides to increase agricultural yields and, ultimately, sustain their livelihoods (Ghadban, et al., 2012; Hamade, et al., 2014). Farmers buy 90% of their inputs using credit, and related expenses amount to between 15 and 20% of their production costs on average (USAID, 2014).

Farmer cooperatives are defined as non-profit organizations that regroup either local producers or processors around a common goal. Cooperatives regroup farmers specialized in a specific agricultural activity such as the production of certain fruits and vegetables, dairy products or mouneh (Traditional Lebanese food products) (ILO, 2018). Cooperatives have had a legal status within the Ministry of Agriculture since 1964, which grants cooperatives subsidies, dedicated programs and support (ESCWA, 2013). However, general public support remains weak, and cooperatives mostly rely on NGOs and international organizations for their funding (CBI, 2016; Ministry of Agriculture, 2014).

Agricultural extension and education are the main function of the Ministry of Agriculture. Throughout Lebanon, there are 28 agricultural centers, 7 technical schools and 3 service centres involved in delivering the Ministry's education mandate (CBI, 2016). However, farm support and the effectiveness of the trainings offered are weak with few classes and trainings being available, and the system lacks both staff and funds (CBI, 2016; Ministry of Agriculture, 2014). Some large-scale farm operations employ their own specialists and several international organizations provide agronomic services (CBI, 2016).

Finally, **international donors** play an important role as their programs and grants for agriculture support farmer livelihoods and partly fill the financial void left by weak social institutions and the absence of a social security system (CBI, 2016; MoA, et al., 2012).

Influencers

Chain influencers include the Lebanese **government** and **international politics**. On the governmental side, agriculture in Lebanon is an activity that is seldom valorized and supported. The budget from the Ministry of agriculture represents 0.5% of the national budget, and less than 1% of all government funding is targeted towards agriculture. This ratio is very low compared to neighbouring countries like Jordan where 20% of the national budget is dedicated to agriculture (Blanc, 2013; Hunter, 2006).

As for international politics, some regional events contribute to making Lebanese agriculture and agricultural value chains more vulnerable to environmental stressors. The ongoing Syrian Civil War disrupts land trade routes linking Lebanon to Syria, Iraq, Jordan, Gulf Countries and Egypt. As a result, Lebanon's agricultural exports to these lucrative markets have fallen drastically (FAO, 2019; IDAL 2017; Wood, 2015).[21] State authorities have developed alternative maritime and aerial trade routes to cope, but these involve higher cost than land routes (Blanc, 2013).

The Syrian conflict further disturbs Lebanese agriculture value chains because Lebanese farmers used to rely heavily on highly subsidized Syrian agricultural inputs, which are no longer available because of the conflict. Indeed, as an outcome of its *laissez-faire* policies, Lebanon does not subsidize its agriculture to the same extent as Syria (Blanc, 2013).

[21] Some agricultural productions in Lebanon are export-oriented as the production far exceeds local demand (CBI, 2016). This includes apples, bananas, citruses and potatoes (IDAL, 2017).

Thus, the end of the subsidized Syrian inputs supply has driven sharp production cost increases for Lebanese agriculturalists (FAO, 2019).

Lebanon is also part of the Pan Arab Free Trade Area that was created in 1998 and fully implemented in 2005. This free trade agreement has led to the removal of all tariffs between Arab states and to the adoption of the WTO trade standards (Harb, et al., 2016). Moreover, this agreement sought to eliminate non-tariff barriers such as the "agricultural calendar", a program that used to allow countries to limit their agricultural products imports during the harvest season in order to promote local supply (Harb, et al., 2016). Yet, trade liberalization in the agricultural sector has been sluggish, and several countries have kept protecting their agriculture and maintained their agricultural calendar barrier (Harb, et al., 2016). This includes Lebanon which has had an agricultural calendar program since the mid-1950s (al Khouri, 2000; Hunter, 2006).

Thus, agricultural value chains for fruits and vegetables in Lebanon are defined by various actors such as producers, wholesalers and distributors, all of which engage in activities that generate cost and rent. External actors such as the government or input businesses have a direct influence on the generation of cost or value by assisting the actors' activities. Finally, events at the national and international levels affect the profitability of agricultural value chains.

Chapter 5: Urban Agriculture Results

In this chapter, I discuss my results regarding the vulnerability factors undermining the livelihoods of urban agriculturalists. Urban agriculture practitioners face several risks and challenges that influence their ability to practice urban agriculture, and thus their livelihoods. UA findings relate to the specific NGO-sponsored projects that the thesis focusses on. The projects target beneficiaries with low SES backgrounds and promote specific UA practises (on balconies and rooftops). This is not an exhaustive account of UA prospects and practices in Lebanon. My primary goal with the urban agriculture component of the research was to interview participants of the Near East Foundation (NEF) project to learn directly from their experiences with UA initiatives aiming to improve the livelihoods of people of lower socioeconomic status (SES). While I had consulted three different reports on the project from NEF, this research highlighted no major shortcoming (NEF, 2016; NEF, 2016a; NEF, 2017). I discovered in the field that the project did not work as well as I had hoped, and that it had become inactive less than one year after its inception.

I learned about the project in greater details when I interviewed Maya, a woman in her 30s who was responsible for implementing the NEF-UA project. She explained that UA was one of the three components of a pilot project aimed to decide if NEF would resume activities in Lebanon. NEF was active in Lebanon during the 1930s in response to the Palestinian and Armenian refugee crisis in the country, but then stopped its activities some time around the Lebanese Civil War (1975-1990). NEF aimed to return to Lebanon in the wake of the post-2011 Syrian refugee crisis and after the completion of the 2015/2016 pilot project, NEF installed its Lebanese branch office in Beirut.

NEF targeted Bourj Hammoud for its UA project as the city hosted important Syrian and Iraqi refugee populations. The overall project had three objectives: building food security with UA, generating income through livelihood trainings, and fight against illiteracy by creating a safe space for providing education for girls of all religious denominations.

The UA initiative involved 70 participants from 25 families. Each objective is connected with a specific sub-project and some families were part of two or three such sub-projects. The most significant result of the UA project was to uncover that developing or engaging in UA was not a priority for local populations. Rather than UA, their greatest priority was to address their precarious situation, and to overcome daily challenges and structural poverty. In retrospect, this is not surprising as people are first and foremost preoccupied by making a living on a daily basis (Leiserowitz, 2007; Merts, et al., 2009).

Most participants demonstrated little to no interest in practising UA throughout the project and had abandoned the one-year long initiative midway, after four to six months. The project was finally aborted in the summer of 2016 in the wake of a major water crisis, and a few months before its official termination planned for September 2016. That summer, Bourj Hammoud's population had to wait for up to two weeks to receive government-distributed water supplies. In such a context, watering the gardens was not among their main priorities, and the gardens disappeared completely. As a result, Maya said that aside from maybe one or two persons, nobody kept practising UA after the project came to an abrupt end.[22]

However, water scarcity proved to be less serious among a series of limiting factors in this project; deeper and more fundamental factors were already hindering the prospects of

[22] During this interview, while speaking about my intended gatekeeper (cf. Chapter 2), Maya said that she would be surprised if that person maintained contact with participants still practising urban agriculture. This confirmed that I would not be able to reach participants in the original project.

urban agriculture in Lebanon. Maya, along with other interviewees detailed numerous reasons that explain UA projects' failure, which I further probe below.

I conducted interviews about UA with a sample of six NGO workers, volunteers and experts, all of whom had previously or currently partake in urban agriculture projects and held similar views towards UA. Those interviewees include employees at the Near East Foundation (Maya) and YMCA (Bassem). Both of these organizations were involved in the Bourj Hammoud urban agriculture project conducted by NEF. YMCA was also involved in a UA project in Bourj Hammoud in partnership with World Vision. I interviewed employees at the Amel Association (Abila, Zaina), an NGO that oversees two urban agriculture projects: one rooftop garden at the Amel Association centre in Haret Hreik (a municipality south of Beirut) and another vertical garden (which are balcony gardens) project at the Association's Ain el Remmaneh (a Beirut suburb) centre. The urban agriculture kits used at Amel Association centres are similar to the ones provided in NEF's Bourj Hammoud project, and were installed as a side component for the cooking classes that the Amel Association arranges. The garden produced vegetables and herbs widely used in Lebanese cuisine like eggplants and tomatoes to be used during the cooking classes. The gardens had been active and maintained by the centres' beneficiaries for one year, as the Amel Association had no budget to dedicate an employee to the rooftop garden in Haret Hreik or to the vertical garden in Ain el Remanneh. I also interviewed Yvonne, a volunteer at Badaro Farmers Market, who has been setting up an UA project at a school in Beirut with Charles, a farmer. Finally, I interviewed Zoona, a specialist on urban-based land growing (cf. Chapter 1), who was involved in a rooftop garden project in Sidon (a coastal city south of Beirut) and at her own apartment block in Beirut.

In all cases, the interviewees understood the failure of urban agriculture projects as a consequence of a mix of factors, namely: the limited available space, urban attitude towards agriculture, lack of individual assets, and the shortcomings of UA kits. To them, there was no doubt that these factors were much more important than water scarcity in explaining why UA projects failed. These vulnerability factors influence individual livelihoods to different extents, and sensitivity and access to assets are key in shaping outcomes. I now unpack these individual factors further.

Limited Available Space

The first factor limiting the practice of urban agriculture was the lack of available and suitable space. UA is first and foremost advertised as a vehicle to enhance both food security and the nutritional well-being of low-income groups (Maxwell, 1995; Morton, 2007; Mougeot, 2005). However, within 'developing countries', low-income individuals often live in overcrowded, densely populated areas plagued with problems such as pollution, dense traffic, and poor water accessibility and sanitization services (Cohen, 2004). This is especially true in the case of Lebanon as Bourj Hammoud is one of the poorest cities in metropolitan Beirut, home to large Syrian and Iraqi refugee communities, and one of the cities with the highest population density in the Middle East (Harake, et al., 2017) (Figure 9). UA projects usually target densely populated and poor urban contexts such as Bourj Hammoud. Yet, such a context is inappropriate for UA, due to the lack of physical capital.

Indeed, as explained in Chapter 2 (see Figure 3), Bourj Hammoud's narrow streets make it impossible to use vertical gardening kits on balconies, given limited light and space. Moreover, most balconies in Bourj Hammoud are covered with sheets that serve to provide some privacy from neighbours, and to block sunlight in order to maintain cooler temperatures

Figure 9 Aerial view of Bourj Hammoud. Portions of Beirut are highlighted in red. The satellite view portrays the dense urban tissue of the city of Bourj Hammoud compared to its surroundings. The population density numbers come from scarce, and sometime widely approximative population data. Lebanon did not hold any population census since the beginning of the Civil War (1975-1990). Thus, the population density values are mostly indicative. Source: Picture: (Harake, et al., 2017 p. 3) edited and modified | Data: (Euromed, 2017; Euromed, 2017a; Harake, et al., 2017; UNData, 2012)

inside apartments (Figure 3, 10). Installing UA gardening kits in a context where space is already limited outside would lead to reduced privacy and higher temperatures indoors.

Rooftops, while offering more space than balconies and receiving plenty of sunlight, breed other challenges for UA. In Bourj Hammoud, a neighborhood where UA projects are typically implemented, buildings tend to be old and decayed. Thus, installing UA kits on rooftops can be challenging. As Maya highlighted, some rooftops are not structurally sound enough to support the weight of UA kits. Moreover, individual participating in UA projects are typically tenants and do not own the building where they live. As Maya mentioned, landlords often refuse to consent to UA projects being implemented on the rooftops of their buildings. In the Bourj Hammoud project, difficulties in finding collaborative landlords forced NEF to reduce the number of potential project participants during preliminary stages. Landlords believe that UA involves more maintenance work and responsibility. Zoona, an expert on urban farming who created a rooftop garden at her apartment block explained that she faced difficulties when trying to convince her landlord to allow her to develop the rooftop garden. The landlord argued that this would involve more work for the janitor. Moreover, people living on the top floor of her

Figure 10 Pictures denoting the heavy presence of curtains on balconies in Bourj Hammoud

building feared that leaves would block gutters and cause water accumulations and infiltration during the rainy season.

Besides the lack of space on rooftops and balconies, the narrowness of the streets also complicated the transportation of material required for the Bourj Hammoud project. Besides the main roads, most streets in Bourj Hammoud allow only one vehicle to go through. In this context, Maya shared that when they were distributing materials for UA, cars attempting to pass were honking at them as they unloaded. The streets offered no space to park on the side without disturbing traffic, making the operation stressful and complicated. The unloaded material, which was often heavy as it included soil and wood, was brought up narrow staircases as there were no elevators in the buildings in this poorer neighborhood, making the process even more difficult and exhausting. Such difficulty in accessing space represents another limitation pertaining to the physical capital required for the practice of UA.

Finally, spaces such as rooftops or balconies often serve other functions that conflict with UA. Within the project in which Zoona was implicated in Sidon, individuals of lower SES used rooftops as a place of entertainment and a place to hang clotheslines. The installation of tomato plants for UA curtailed other uses of the rooftop space. The tenants had little interest toward UA, which led the project participants to replace the tomato plants with roses and restore the prior functions of the rooftop.

UA does not necessarily need to be done on rooftops and balconies. It can also be done on small vacant lots in the city. This last instance is known as urban farming, and as explained in Chapter 4, it constitutes another aspect of urban agrarian practice. However, the use of vacant lots for urban farming causes even more complications in the context of Beirut. First, Beirut developed rapidly after the civil war without any urban development master plan,

and as a consequence the city's built areas expanded over every plot of land available (Huybrechts, 2002). While a few vacant lots remain, Zaina – an employee at the Amel Association who managed UA projects – explained that using these lands would ignite social tensions. Tensions can occur between Syrian and Iraqi refugees and Lebanese locals, who all benefit from NGO aid. NGOs thereby need to balance the amount of aid they provide to each of these individual communities. In promoting UA projects, they must avoid benefiting one community over the others, as failing to do so would undermine their reputation within the overall population. With very few available plots of land available, and even fewer that can constitute potential meeting grounds between communities, establishing UA projects in any location besides balconies or rooftops is nearly impossible.

As most UA projects are implemented in poor neighbourhoods such as Bourj Hammoud, the lack of physical capital required to practise UA is a main limiting factor. Rooftops and balconies do not offer enough space to produce enough vegetables and herbs for UA to be attractive. Rooftops, which have greater yield potential than balconies, are not always available or suitable for supporting UA kits, and they are difficult to access. Finally, rooftops often have other uses that compete with UA for space.

Urban Attitude Toward Agriculture

The second factor contributing to limit the practice of urban agriculture combines the urban attitude toward agriculture together with circumstances that reduce the desirability and practicality of UA for individuals of lower SES in Beirut. Not only does the urban context of Beirut not provide enough space to practise UA, it also has a social environment that belittles agriculture in general: one can easily buy cheap fruits and vegetables down the street; access to irrigation water is random; and those coping with precarious livelihood

conditions have little to no free time to engage in UA. This factor was mainly underlined during the interviews as 'urban mentality'. A term which encompasses a lot of sub-elements, including the easiness to just buy food down the street instead of growing it and an unfavourable attitude towards agriculture, that the interviewees all framed under this label of "urban mentality".

As stated in Chapter 2, Lebanese society tends to see agriculture negatively, considering it as an activity fit only for the lower class. Thus, Rahim, the agricultural science graduate I presented in the introduction of this thesis, told me about the disdain people express when he tells them about his field of study. In some cases, the population's support for local producers is mainly motivated to prevent additional migration of rural families to the city and not to help agriculture, as a quote from an attendee at Souk Jana Loubnan demonstrates (Chapter 2). Peoples' attitudes target agriculture and UA but not ornamental plants, as Zoona pointed out in French: "il y a l'attitude qu'on ne veut pas faire d'agriculture, mais c'est correct d'avoir des plantes pour la décoration » (pers. comm. October 10, 2018).

In this context of low interest toward agriculture in general, Bassem shared that it was difficult to get target populations to become involved in any UA project. NGOs often try to convince individuals to participate in such projects by claiming it would be to their benefit. However, as the project participants produce herbs and vegetables that differ from what they usually consume and discover that yields are not as high as expected, they usually abandon UA projects. The projects were not producing enough to be a viable option for the individuals when they could easily buy cheap fruits and vegetables down the street. Moreover, as the projects targeted individuals of lower SES, the beneficiaries were in precarious livelihood situations and did not possess enough free time to practice UA.

In the case of the Bourj Hammoud project, Maya shared that only two among 70 participants were interested in keeping their UA kits at the end of the project. This included one rural Syrian refugee and one Lebanese local who had a natural skill for gardening. UA provided the rural Syrian refugee with a sense of purpose as he was struggling to find a job and earn income to feed his family. Even though most beneficiaries did not want to keep their kit, they expressed that UA provided welcomed green spaces and a boost in morale. Yet, this was not worth the extra effort of maintaining gardens.

'Urban mentality' creates several challenges for UA projects, as participants are less likely to learn and properly mobilize the human capital they acquired during training sessions. First, the project participants tend not to follow UA training properly. Due to a lack of interest, participants do not acquire the necessary human capital required for this activity. Targeted populations are often marginalized and preoccupied with making a living on a daily basis, making UA a low priority for them. Abila, an employee at the Amel Association's Haret Hreik centre, explained that during the cooking classes, a visiting trainer teaches the beneficiaries how to cultivate within various settings, using household items and empty containers. However, very few of the students in the class were interested in learning about urban agriculture, and Abila hypothesized that perhaps only one or two beneficiaries applied the knowledge acquired in class to grow some crops on their balconies. Similarly, in the Bourj Hammoud project, most project participants produced few vegetables and herbs as they did not adequately practice UA due to lack of interest and time. Only a few participants succeeded in producing fair yields, including one who was able to produce one bowl of salad worth of vegetables a week.

Second, with regards to the vertical kits used in the NEF's Bourj Hammoud project and in Amel Association's Ain el Remmaneh centre, Maya, the project officer of the NEF's project, said that the project participants often fail to water the plants, which she again blamed on their lack of interest toward agriculture. Such neglect causes the plants to wither as the vertical kits, made of used plastic bottles, contain only a small amount of soil and need to be watered daily (Figure 11). Such kits, as explained by my gatekeeper, are designed in such a way that plants that need the least amount of water are placed at the top of the structure, and plants that need the most water are placed at the bottom. As such, any water runoff is received by the lower plants and no water is wasted, reducing pressure on water resources. Although this precaution is considered in the conception of the kits, it does not protect the crop against the behaviour of beneficiaries who are unlikely to water the plants daily due to the 'urban mentality' that sees agriculture only as a rural activity, and do not have time in their busy and precarious lives to water their plants daily. As most beneficiaries did not water their plants regularly, their kits quickly withered and the plants died. Most beneficiaries decided to leave the ongoing project as a replant was required to restart the gardens, and they were not inclined to change their habits and attitudes. NEF's project in Bourj Hammoud was finally aborted in the summer of 2016 in the wake of a major water crisis. That summer, Bourj Hammoud's population had to wait for up to two weeks to receive government-distributed water supplies. In such circumstances, watering the gardens was not among the beneficiaries' main priorities.

Figure 11 Vertical kit used at the Amel Association Centre in Ain el Remmaneh. The same kit was also used in the Bourj Hammoud project. Source: The Food Heritage Foundation

This ‘urban mentality’ also plagues rooftop kits in the same way because beneficiaries watered rooftop kits as little as they did for vertical kits. As told by Abila, beneficiaries were responsible to maintain the rooftop garden at the Haret Hreik centre that the Amel Association oversees. Yet, beneficiaries showed little interest and no one came to water the plants during the summer while the centre was not very active, causing the plants wither and die. People were not actively involved at Zoona’s apartment block rooftop garden either. Even when the plants were moved to ground level in the parking lot next to the concierge, he watered them scantily. Given the participants’ minimal interest in agriculture, they tend to abandon UA projects early on, unless constant support and check-ups are performed.

The ‘urban mentality’ does not only pertain to urbanites, but also to rural refugees who internalize the urban mentality when settling in an urban context. At some point during my field interviews, I inquired if rural refugees’ human capital, including knowledge about how to grow crops, could be used within urban agriculture projects. Yet, the limitations of this idea quickly became apparent. As Zaina told me, refugees tend to settle within contexts similar to those they used to inhabit prior to becoming refugees. Therefore, refugees coming from urban regions tend to settle in urban areas, and refugees from rural settings tend to seek similar settings. Thus, very few rural refugees tend to go to urban areas, which limits the number of refugees with agricultural knowledge in the cities. However, within the rural refugee populations who do move to urban areas, most are often unwilling to use their knowledge in cities, due to the same ‘urban mentality’ that frames agriculture as a rural activity. Zaina shared that rural refugees struggling to make ends meet indeed quickly adopt the urban mindset. Thus, the human capital of those rural refugees is lost as they internalize the urban mindset and belittle agriculture.

In short, the 'urban mentality' – including an urban outlook unfavorable to agriculture, the precarious livelihoods of beneficiaries, limited availability of water resources and the ease of simply buying food down the street instead of growing it – adds significant challenges for urban agriculture in Lebanon. Beneficiaries feel little motivation to apply the human capital they acquired about UA. The 'urban mentality' also leads to human capital losses, as individuals who previously held agriculture-related knowledge, such as rural refugees, abandoned it upon settling in the city.

Lack of Individual Assets

The third factor contributing to limit the practice of urban agriculture is the beneficiaries' lack of knowledge (human capital) and money (financial capital). This shortage of assets is partly due to the 'urban mentality', which hinders the acquisition of human capital. However, other factors also infringe upon the ability to acquire the assets required for urban agriculture, hence why I address this factor as a specific category. Urban agriculture requires project beneficiaries to acquire knowledge (Prain, et al., 2007), which proved to be problematic in urban areas in Lebanon. For instance, Bassem expressed that beneficiaries are not accustomed to growing plants in general. When a problem occurred at Zoona's roof garden, no one knew what to do. Moreover, none of the tenants wanted to take the time to learn how to conduct UA properly.

Acquiring UA knowledge or even basic agricultural knowledge is particularly challenging for the target population of the studied UA projects. For instance, most of the beneficiaries of the NEF's Bourj Hammoud project, of Amel Association's centres and of the Sidon UA project in which Zoona was involved do not have high school degrees. As Zaina pointed out in French, adult beneficiaries are less inclined to learn anything new, "les adultes

ne veulent plus apprendre" (pers. comm. October 8, 2018), as they have not been in a learning environment for a long time. They have few livelihood opportunities and prospects and face financial difficulties. They live in precarious situations, and their main preoccupations are centered on finding ways to enhance their livelihoods. As a result, target populations are less inclined to be taught UA, as they prioritise more urgent needs. This is especially true as earlier UA projects have achieved little results and did not reduce their livelihood vulnerability whatsoever. As Maya and Bassem said, UA does not contribute to food security for project participants, because they still buy most of their food. Combined with the urban mentality which causes their disinterest in the first place, the challenges to learning act as limitations to the acquisition of the knowledge needed to practise UA correctly.

In contrast, young people are going to school and are already involved in learning processes, which makes them more favourable candidates to acquire knowledge about UA. However, facing precarious situations similar to those of the adults, they do not have the ability to apply the knowledge they gain. This means that even when UA training is provided, as is the case at Amel Association centres, just a few recipients might be practising UA at home.

Finally, finding adequate trainers who can share UA knowledge is also a challenge. Maya explained that collaboration with the first trainer that the Amel Association hired for managing their urban gardens in Haret Hreik and in Ain el Remmaneh was not good. Beneficiaries did not like him as he was always late and uncooperative and was not understanding participants' needs. They had to replace the trainer, which was not easy, as virtually all agriculture focussed NGOs and agronomists work in other regions of the country, but not in Beirut where the urban context discourages any agricultural practices. In the end,

the Association hired a second trainer who previously worked in the Bekaa valley for an NGO specialized in native seeds. The presence of this new trainer from the Bekaa NGO yielded improvements to the training as he had better knowledge of agricultural practices and greater experience in training individuals of lower socioeconomic status (SES). However, such teaching intervention seem to have a limited reach, as people who are taught UA through NGO training do not seem to master the knowledge and use it correctly. My informed guess is that such trainings do not provide sufficient human capital and hands-on experience for the practice of UA, and do not trigger enough interest from the beneficiaries to convince them to acquire further knowledge either, as they already face several challenges in making a living daily.

UA also requires financial capital to buy material, tools and inputs. This requirement constrains UA developments further, as beneficiaries, who are individuals of low SES, do not possess enough financial capital to readily and easily apply any knowledge they gain about UA. Thus, Maya said UA is not economically feasible for the beneficiaries unless external actors support it systematically.

Only individuals of higher SES have access to the financial resources required to practice UA without any external support. For instance, Baqil, who owns an aquaponic business, utilizes an aquaponic system on his balcony for which he invested $1200[23] and which allows him to produce vegetables worth $1000 annually. While the monetary investment is important, he explained that the biggest investment necessary from individuals is the time to acquire knowledge, which is difficult for individuals of lower SES to spare their time as they work to meet their daily needs. In this context, the practice of UA is not seen as

[23] USD is the currency in use in this paper unless otherwise stated.

a solution to reduce food-related expenses, but rather as a hobby. For instance, Bassem's uncle practises UA for the gratification it brings him to see something growing under his care; as Bassem noted in English, "My uncle does it for fun" (pers. comm. October 23, 2018). Indeed, Bassem's uncle harvests about one bucket of cherry tomatoes monthly, equivalent to only about 3% of his vegetable consumption. The two participants who kept their UA kits after the termination of the Bourj Hammoud project also stated gratification as the main driver for successfully learning and conducting UA.

The difficulty to acquire the human capital necessary for practicing UA, and the high financial costs associated with this activity makes UA less suitable for individuals of lower SES. When an individual has enough financial capital and time to acquire knowledge related to UA, the 'urban mentality' acts as an additional barrier to the acquisition of human capital.

Shortcomings of UA Installations

The fourth and final factor contributing to the limited practice of urban agriculture is the UA kits' shortcomings. As it was already suggested in the previous sections, UA installations are not suitable to local conditions. Some of these issues concern the kits used at Bourj Hammoud and Amel Association centres, and some apply to UA more broadly. Shortcomings of UA installations in general include the amount of soil and watering necessary, the intensity of the sunlight to which crops are exposed and pest infestations. These are all factors that act as limitations in natural capital.

A shortcoming that particularly affected the kits used in Bourj Hammoud and at Amel Association centres was the need to water the crops daily. Those kits were acquired from a prior project from the American University of Beirut (AUB) with little to no modifications. As I explained in Chapter 4, UA kits often rely on recycled resources to reduce cost, minimize

impacts on natural resources such as forest, soil and water, and ultimately enhance the adaptive capacity of vulnerable populations (de Zeeuw, et al., 2017; Paavola, 2008). UA kits' conception in Bourj Hammoud and at Amel Association centres fall in line with this logic, as the kits are almost entirely made up of recycled material, such as reused 2-litre plastic bottles. As my gatekeeper told me, this is advantageous as individuals with low incomes can make their own UA kits if they are interested, as they can easily gather the materials necessary on their own. However, Bassem commented that the kits in the Bourj Hammoud project were not innovative and required constant work and watering.

The little quantity of soil used in vertical kits is not the only reason why plants dry out, as beneficiaries often fail to water their crops even in kits using more soil. This was well explained by Bassem when he spoke about a previous project the YMCA conducted in partnership with World Vision. The UA kits used for this project consisted of a PVC pipe cut in half and filled with earth. The pipes were installed on balcony walls with a slight tilt. This tilt allowed the water in an uppermost bucket to flow through the soil towards a bucket located at the lower end of the pipe (Figure 12). As such, beneficiaries only needed to water their kits once a week. The kits were used to grow herbs often used in Lebanese cuisine like parsley, which beneficiaries usually consume. The kits offered a good return on investment as each kit cost $100 and could produce LL100,000 (Lebanese pounds[24]) ($67) of herbs monthly. Nonetheless, despite the advantages the PVC pipe kit offered, the project lasted for only four months. Bassem cited the 'urban mentality' for the cause of the failure, as

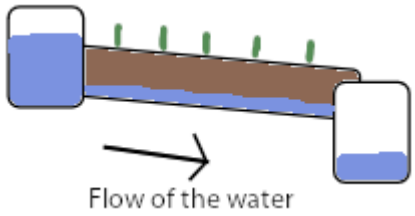

Figure 12 Schematic representation of the PVC pipe kit

[24] Lebanese pound is the currency in Lebanon, peg to the US dollar. It is denominated as LL. LL 1500 equals USD 1.

beneficiaries did not care about UA and had more urgent uses for water, so they failed to water their plants and did not follow up on the project.

Withering plants were also a problem with rooftop kits, which are often made with recycled milk crates, or other recycled crates, and contain much more soil. As I learned from Abila, rooftop kits are exposed to strong sunrays which can easily parch the crops during summer, which occurred at the rooftop garden at Haret Hreik (Figure 13). Abila said rooftop kits require the installation of solar protection materials such as a plastic roof panels to protect the plants against the sun and help safeguard the garden. She said that these would be added at Haret Hreik's rooftop garden at the beginning of the autumn classes, when they replant the garden.

Figure 13 The parched rooftop garden at Haret Hreik.

The experience of the rooftop garden at Haret Hreik indicates a lack of planning when UA projects are conceived, and this case is not unique. I had the opportunity to visit the construction site of a rooftop garden project with students at a school in Badaro (a neighborhood of Beirut). Charles, a young organic farmer (Ch. 6), and Yvonne, a volunteer for a farmers' market, spearheaded the project as part of an agreement with the school administration. The day I was present, Charles and Yvonne were cleaning up the roof with the students in order to provide space for the future rooftop garden. The students cleaned up the remains of a decorative garden installed by the school. The plants died because of the same factors as the rooftop at Haret Hreik centre; the absence of protection against the sun's rays

Figure 14 Parched ornamental plants on the roof of the school.

and lack of maintenance by the school left the plants vulnerable (Figure 14). As I spoke with Charles and Yvonne about what they intended to do, they explained that they planned to provide students with a crash course in garden design and have them design the rooftop garden. During the discussion, I raised the point about solar protection, which they acknowledged was a good idea that they had not taken into consideration indicating that it is an element often overlooked.

Another problem with UA kits relates to the presence of pests. Pest infestation represents a third limitation in natural capital, as underlined by the literature (cf Chapter 4). During my fieldwork, interviewees highlighted several times that birds and ants were major annoyances. At Amel Association's Haret Hreik centre, Abila noted that birds were an issue as they would come and eat the crops. They tried to solve the problem by making a scarecrow to frighten the birds, without any success (Figure 15). Without any other alternatives or knowledge, finding a solution has been difficult.

Figure 15 A scarecrow was installed in the rooftop garden in Haret Hreik to deter birds from eating the vegetables, without success.

Insects such as ants were even more problematic. Ant infestations notably affected the vertical kits of the Amel Association's Ain el Remmaneh centre. Zaina shared that they took these installations down because the crops withered during the summer as no beneficiary took care of them (as with Haret Hreik), and due to ant infestations. Zoona

encountered similar problems with her project at her apartment block, where insects such as ants and snails also infested the rooftop garden. Most occupants of the apartment block did not know how to solve the problem and did not want to bother learning how to deal with such pest infestations. Pest infestation is such a problem in UA that even Zoona, who made a garden on her own balcony after her rooftop project failed, removed this second garden as she did not have time to deal with the pest infestation even though she had the knowledge she needed to solve this problem.

Urban agriculture often relies upon recycled material only holding a small quantity of soil that beneficiaries need to water every day. Rooftop gardens require solar protection for the plants that are not installed by UA projects. Project recipients do not possess the knowledge to deal with pest infestations which is a major problem with UA. Finally, even when the UA kits design take into account environmental factors and are conceived in such a way that they require less labour investment, the 'urban mentality' discourages most beneficiaries to continue the practice of UA.

Conclusion

In conclusion, UA projects are represented as a livelihood strategy to enhance the livelihoods of lower SES urbanites. However, the studied projects failed to muster the necessary human capital to allow beneficiaries to practice UA. Among all the limiting factors, those combined under the label 'urban mentality' quickly come to the forefront, and beneficiaries struggling to make a daily living abandon UA when the projects do not yield enough food to be worth the effort. The urban environment and mindset acts as a livelihood context which strongly limits the use of human and financial capital, hindering the practice of UA as a livelihood strategy. However, limitations to other capitals contribute to undermining

the practice of UA in Lebanon. Pest infestations, neglecting to water the plants, and their vulnerability to sun rays detoriate the natural capital, which further limits the practice of urban agriculture. Furthermore, there is a lack of physical capital to practise UA, as poor and underdeveloped neighbourhoods offer limited space to work with. As a consequence, UA produces low yields, does not make the beneficiaries more food secure and does not have a great impact on household income. Thus, UA does not contribute to making urban agriculturalist livelihoods less vulnerable.

Therefore, the studied NGO-sponsored UA projects are not suitable in the Lebanese context, at least not under the current organization and conduct of the projects. UA is meant to create livelihood opportunities and improve people's standards of living. Greater access to opportunities implicates less vulnerability. However, the UA projects failed to provide any opportunity to enhance the participants' livelihoods. Figure 16 highlights how these results fit within the livelihood framework I presented in my conceptual framework.

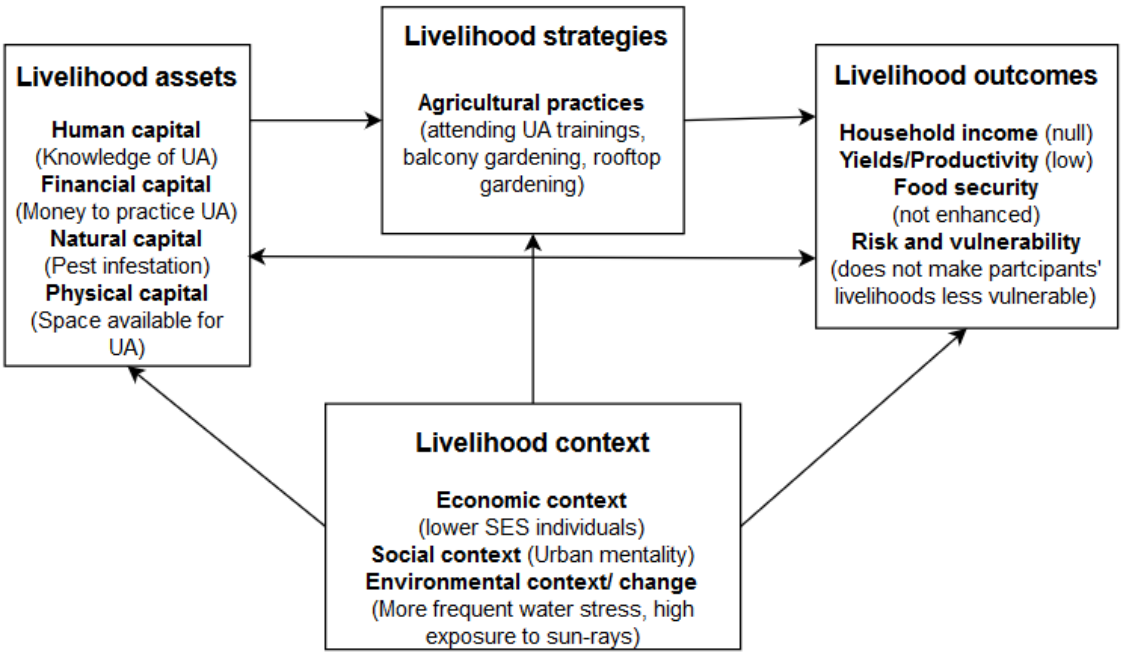

Figure 16 Links between livelihood assets and livelihood outcomes. Source: Own adaptation of Nkala, et al., 2011 p.762 (modified to better represent my results)

Common Challenges between Projects in the Middle East and North Africa Region

In light of these results, the challenges that the studied urban agriculture projects face in the Greater Beirut area and in the rest of Lebanon are similar to challenges that other UA projects have faced in the Middle East and North Africa (MENA) region (Chapter 4 and Table 2). One common issue is that UA projects are donor-driven activities. This was the case with the Amman project where its success and growth were dependent on the continuous work of the Greater Amman Municipality and that of the other actors involved. This was also the case

Table 2 Table representing the common challenges faced by UA projects in the MENA region.

	External Support	*Context*	*Results*
Amman project	Greater Amman Municipality, RUAF, AUB (ESDU)	Middle SES individuals, rooftop gardens	10% of annual consumption of vegetable for two individuals
Cairo project	RUAF (later 7UP Company)	Lower SES individuals, rooftop gardens	Null, provided greenery and reduced urban heat island effect
Gaza project	FAO	Lower SES individuals, rooftop aquaponics	Good yields while supported, null when external support retracted
Beirut projects	NEF, YMCA, AUB & Amel Association	Lower SES individuals, rooftop and vertical gardens	Null, provided greenery and boosted moral

for the Cairo project where UA only existed because of the central role of RUAF, and afterwards of the 7 Up Company. Likewise, the project in Gaza portrays the same reality, as the withdrawal of the FAO caused the aquaponic installations to be abandoned. As Maya and Bassem explained, UA projects are not economically sustainable for individuals of lower SES without constant support and accountability to an external actor.

Another common issue is the failure to take the local context into account. The rooftop farming projects in Cairo, made up of simple hydroponic systems, provided no increase in food security. Limited knowledge about the practice of UA and low dedication to it yielded poor results. The main benefit identified was the positive role of urban agriculture in adding green cover and in reducing an urban heat island effect (Dubbeling, et al., 2014; de Zeeuw, et al., 2017). In the case of the project in Bourj Hammoud, the benefits were essentially similar, although the project also provided some of the beneficiaries with a sense of purpose. Participants welcomed green spaces as Bourj Hammoud lacks such environments (compared to other cities in the MENA region such as Cairo).

This is not an exhaustive account of UA prospects and practices in Lebanon. The conclusion applies only to the specific cases. Even though I do not aim for results to be replicable, I argue that they can potentially provide future research with a framework to analyse other UA projects. The similarity of these challenges indicates a failure to account for the results of UA projects carried out elsewhere. UA projects with the best intentions often fail because the local context is overlooked and not given enough consideration. As the UA projects I reviewed replicated such shortcomings, they were doomed to face similar challenges. In conclusion, UA does not seem to be for individuals of lower SES in the MENA region, at least not under the studied practices.

Chapter 6: Fruit and Vegetable Value Chains Results

The second component of my research aims to look at the vulnerability factors undermining the livelihoods of actors involved in fruit and vegetable value chains. As with the UA section, this chapter aims to assess the factors influencing and limiting the practice of agricultural activities, this time in rural contexts. Like the factors shaping the vulnerability context of urban agriculture practitioners, commodity chain vulnerability factors are also centered on human and financial capital, although social capital stands out as a more important factor than it does for urban agriculture. This indicates how various livelihood assets manifest themselves differently depending on the agrarian practices involved. These circumstances in turn have different influences on the vulnerability of farmer livelihoods.

Following the value chain analysis approach, I will map and segment the different components that determine cost[25] and value in agricultural value chains for fruits and vegetables. Building upon sustainable livelihoods approaches, I will analyze the factors shaping the vulnerability context of the producers, wholesaler, and processors involved in these agricultural value chains.

1. Producers

Value chain analysis reveals an interesting aspect of agriculture in Lebanon, as it highlights that farmers cope with different levels of livelihood vulnerability, and that farmers' level of knowledge can affect how they will cultivate and sell produces. Even though each interviewee has an individual life and experiences, they also share commonalities that allow

[25] In the present analysis of fruit and vegetable value chains, there is the mention of prices, but this thesis is not a comprehensive analysis of pricing. The data gathered on the field is too sparse to allow a comprehensive analysis, and the main focus of this research is to look at the livelihoods' vulnerability of the different actors involved.

me to group them into four broad categories. Among these, I identify two broad categories of farmers standing out from my data, namely; *Conventional farmers* and *Organic farmers*. *Conventional farmers* encompass the vast majority of farmers, who practise intensive agriculture and utilize important quantities of farm inputs such as chemical pesticides and fertilizers. They range from small[26] to large-scale farmers. O*rganic farmers* encompass a small number of individuals who practise agriculture on a smaller scale using less inputs. *Organic farmers* differ from *conventional farmers* not only by their practices but also in their knowledge, social background and the markets they are involved in. Along with farmers, two other groups of producers exist. The third group of producers, which I refer to as *Investors*, represents a new paradigm emerging in Lebanese agriculture; their practices differ from those of *conventional farmers* as they and focus first and foremost on profitability and use modern farming technologies. The fourth group, known as *Waqf*[27], are small producers who also provide support to *conventional farmers* and even *investors*.

1.1 Conventional Farmers

Conventional farmers are the majority of agricultural producers in Lebanon. During my fieldwork, I only spoke to small-scale *conventional farmers* as I did not have any opportunity to speak with large-scale farmers. *Conventional farmers* rely heavily on inputs such as chemical pesticides and fertilizers and use extensive irrigation and farm equipment. They also use greenhouses, which in the case of costal farmers allow them to keep growing crops such as lettuce and tomatoes during the off-season.

[26] Small-scale farmers, according to the World Bank's moderate poverty line definition, are considered as producers with fewer than 5 ha, 5 Tropical Livestock Units (TLUs) and $8405 of revenues (Khalil, et al., 2017). Small-scale farmers encompass more than 80% of farmers in the MENA region (FAO, 2015).

[27] The Waqf system is an endowment of economic or social assets, mostly plots of land and buildings, to a religious community destined for caritative purpose in the MENA region. (Lteif, et al., 2017; Kuran, 2001)

Conventional farmers use important amounts of chemical inputs in order to maintain stable yields, which makes chemical fertilizers increasingly important to their livelihood sustenance. This overreliance on agricultural inputs results in a reduction of their natural capital and in increased financial pressure. *Conventional farmers* are thus highly exposed to external factors such as climate change and price fluctuations, which makes both their activities and livelihoods more vulnerable than those of other actors. Dasia, an agrarian studies doctoral candidate specialized on Waqfs, explains that this overexposure to external factors also pushes some conventional farmers to overuse pesticides as a preventive measure to minimize losses and stay profitable.

Conventional farmers overuse chemical inputs mostly because they lack the human capital that would allow them to adapt to changing conditions. These farmers also lack financial capital that would help them acquire new knowledge. This means that *conventional farmers* rely on government, business, or NGO-provided training to gain new knowledge that would support them in their livelihoods. However, insufficient government funding (cf Chapter 4) means that state agencies providing agricultural training, such as the Investment Development Authority of Lebanon (IDAL), cannot offer sufficient support to farmers. This results in NGOs and agrarian input companies filling the gaps and providing training services that governments normally provide. According to Zoona, a specialist on urban-based land farming, farmers become over-reliant on the input companies that offer them training on how to use more inputs, while marketing their own products at the same time. Those inputs are then bought using credit granted by those same input firms. This means that most *conventional farmers* acquire knowledge that is detrimental to the sustainability of their

livelihoods, as their practices deplete the land they cultivate, reducing their natural capital and crop yields.

Conventional farmers are usually tenants on the land on which they work, which creates additional livelihood insecurities. Farmers can never be certain if their lease will be renewed or not. According to Zoona, farmers usually sign two or three year-long leases, which is too short of a timespan for most conventional farmers to justify the acquisition of farming equipment that requires more than two years to be repaid, such as greenhouses. The possibility of not having their land contract renewed renders farmer livelihoods financially vulnerable and adds an additional factor of vulnerability for them.

Another important factor of vulnerability influencing *conventional farmers'* livelihoods is the monopoly position of wholesalers. *Conventional farmers* are mostly individuals with low SES backgrounds, and low human and social capital levels. This means that they have little opportunities to sell their fruits and vegetables on their own. Therefore, they mostly sell their products to wholesalers with a monopolistic position in fruit and vegetable value chains. Farmers earn 40-50% of the final retail price when selling to wholesalers. Further subtracted from those profits is the cost of transportation, which farmers pay to carriers or damans (cf Chapter 4). Jasar, an *organic farmer* who was previously a *conventional farmer*, said damans used to come to his orchard to buy apples. They would then take their collected produces and sell them in the wholesale market. A farmer selling his product to a daman is paid 30%-42,5%[28] of the final retail price. In both cases, *conventional farmers* receive little monetary gain from

[28] These values posit farmers selling their products in a wholesale market are paid 40-50% of the final retail place, and Damans buy fruits and vegetables at a price 15 to 25% below wholesalers' prices.

their production, resulting in low financial capital ownership, rendering their livelihoods vulnerable.

Conventional farmers expressed concerns about the trustworthiness of the wholesalers to whom they must sell their products, as well as the government's genuine willingness to implement its own agricultural calendar[29] (cf Chapter 4). Jasar said that when he used to sell his fruits to wholesalers, the government would not respect the yearly temporary import ban it established to protect Lebanese agriculture from foreign supply (cf Chapter 4). However, Jasar last dealt with wholesalers five years ago, and since then made the transition to organic agriculture. Rahim, an *organic farmer* selling some of his production to wholesalers, said the government now respects the calendar, although he said this was a recent development. However, the calendar appears to be implemented in an inconsistent manner, as Dasia shared that the government was not respecting the agricultural calendar regarding the production of figs, indicating a variable and irregular application. The reasons for this variability are unknown to me. Nonetheless, this inconsistency in the application of the agricultural calendar means *conventional farmers* operate in a market that can be flooded with foreign fruits and vegetables, creating price and income instabilities detrimental to *conventional farmer* livelihoods.

Conventional farmers rely on inputs and input companies to produce high volumes of fruits and vegetables. Wholesalers are often the unique channel available for them to get their products to consumers. Lack of human and financial capitals hinders their ability to change and to adapt their practices to external factors, while lack of social capital confines

[29] Conventional farmers were the only actors to raise this issue, as implementation of the agricultural calendar primarily affects and concerns conventional farmers' livelihoods.

them to resorting to wholesalers to sell their products. In addition, deteriorating natural capital increases their reliance on inputs and further reduces their financial capital. Thus, several vulnerability factors severely undermine the livelihoods of *conventional farmers*.

1.2 Organic Farmers

Organic farmers make a small minority of farmers who have adopted organic or sustainable agrarian systems. Some farmers practise organic agriculture and hold an organic accreditation. Others practise permaculture.[30] Due to the nature of their farming practises, *organic farmers* require specific human capital skills that differ from conventional agricultural knowledge. Knowledge plays a central role for *organic farmers*. Knowledge of the predicaments of organic agriculture also allows organic farmers to be more financially secure than conventional farmers. Organic agriculture is a low-input activity and yields products that can be sold for a higher price than conventional equivalents. This has a direct impact on the farmers' incomes and ability to sustain their livelihoods (Qiao, et al., 2013). Thus, *organic farmers* tend to be less financially vulnerable than *conventional farmers*.

Most *organic farmers* I spoke to were previously *conventional farmer*s. They made a transition to organic agriculture because of their environmental convictions and because they were able to gather knowledge about this farming system. Such a transition is not always easy though. For example, Jasar, an *organic farmer* owning an orchard, stated that he made the transition from conventional to organic farming because of his previous unstable financial situation and of the difficulty he had supporting his family. The switch to organic agriculture and to direct sales took him three to five years of adaptation before that transition paid off.

[30] Permaculture is a farming system that emphasizes sustainable land-use practices allowing the exploitation of permanent culture. Permaculture looks at natural patterns and at the interactions within an ecosystem to establish an agricultural production which will maximize outputs while minimizing inputs (Fergurson, et al., 2014; Mannen, et al., 2012).

In contrast, a small portion of organic farmers have always been exclusively practising sustainable agriculture[31] . These farmers did not get to acquire specific knowledge per se, as they already had it by the time they have gotten involved in sustainable agriculture. Much of this knowledge was family inherited, demonstrating the importance of social capital in the practice of organic agriculture.

Organic farmers often come from wealthier backgrounds than *conventional farmers*, often being members of the already small and shrinking middle-class that exists in Lebanon. Being individuals of higher SES, they own financial capital, which is an asset that can be used to acquire critical human capital to practice sustainable agriculture. Similar to UA, the acquisition of knowledge about organic agriculture or permaculture depends on the ownership of enough financial capital and is less accessible to individuals of lower SES. Depending on how and why *organic farmers* start their activities, they can be further divided in three categories, akin to Naspetti et al (2016) and Bteich (2004)[32] categorizations: **ideological**, **commercial** and **developmental**.

Ideological organic farmers encompass those whose practice organic farming for ideological reasons, convinced by the underlying principles of organic agriculture. As explained by Naspetti et al (2016: p.71), they are "farmers who are well informed and convinced about the underlying principles and the philosophy of organic farming. They are the pioneers of the Lebanese organic farming experience". *Ideological organic farmers* practise organic agriculture or permaculture to reduce their use of agrarian inputs. Farmers

[31] In this instance, sustainable agriculture refers to agricultural practices making "the most efficient use of nonrenewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls" (USDA, 2017 p. N.P.). This understanding of sustainable agriculture is used as farmers I have met in large part referred to their practices as in accordance with natural cycles and processes.

[32] The category names are my own and are based on Naspetti and Bteich's descriptions and my observations during fieldwork (Bteich, 2004; Naspetti, et al., 2016).

selling at *Badaro Farmers Market* mostly fit that category, as those with whom I spoke overwhelmingly asserted environmental considerations as their main reason to practise organic agriculture. For example, Zyan, a French-speaking agricultural engineer[33], shared that he is practicing permaculture "pour réduire l'usage en eau, terre et nutriments pour avoir une agriculture soutenable" (pers. comm. October 7, 2018). Rahim likewise explained that when he was working in a conventional orchard before practising permaculture, he made sure to "respect the pH, be as healthy as possible" while applying pesticides. Therefore, for those farmers, environmental considerations are their main driver to practise sustainable agriculture.

Figure 17 Organic marketing at Souk el Tayeb

Commercial organic farmers are wealthy landowners who began organic production as a business strategy with the aim to benefit from food trends emerging among wealthy Lebanese. They are farmers who "pay attention to trends in western countries and can afford to experiment with new production techniques while facing any possible initial losses in production" (Naspetti, et al., 2016 p. 71). Market opportunities convinced them to grow organically and

[33] His agricultural engineering background enabled him to practise permaculture. He is a prime case of an individual who can practise organic agriculture as his higher SES background allowed him to obtain the required human and financial capital.

to acquire organic certification in order to appeal to wealthier customers. The farmers and producers I encountered at Souk el Tayeb mostly fit that category as their stands and products clearly advertise the organic label of their products (Figure 17).

The *commercial organic farmers* with whom I spoke asserted that the emergence of business opportunities was the main reason they practise organic agriculture. This was the case with Abila, a lady selling at Souk el Tayeb Downtown & Clémenceau and owning, together with her uncle and her dad, a large-scale farm employing agricultural workers. Abilia explained they decided to switch to organic agriculture to benefit from emerging economic opportunities, which she said paid off. After switching to organic agriculture, they also changed in the ways they commercialize their products and now sell directly to consumers, including individuals via online baskets and at farmers' markets, as well as restaurants. At Souk el Tayeb, Abila has a stand spawning two units, indicating affluence since renting a stand in this market is costly, as I was told by Zyan who once considered selling at Souk el Tayeb.

Developmental organic farmers partake in the organic agriculture projects that NGOs and international organizations implement in Lebanon. Their knowledge of organic farming comes from NGOs and the farmers "follow to the letter the instructions they receive from the organizations" (Naspetti, et al., 2016 p. 71). I met few *developmental organic farmers* and those I met were supported by the Akkar Rural Development Initiative (ARDI) that regroups 12 cooperatives in Akkar (the northernmost region of Lebanon). This initiative is funded by the EU and implemented by Fair Trade Lebanon (FTL) and Expertise France. An ARDI employee named Farez told me that the initiative provides training on an array of subjects to farmers. The trainings aim to add value to farmers' products, to provide them with the required human capital to practise organic agriculture, and to bypass wholesalers. *Developmental organic*

farmers seem to be the only *organic farmers* who can be individuals of lower SES, as external actors support them. However, the *developmental organic farmers* I encountered seem less successful than their *organic farmers*' counterparts, as they still heavily rely on wholesalers to sell their fruits and vegetables. Two farmers with whom I spoke at Menjez cultivate mainly pumpkins and pomegranates, and said they were selling most of their products to Tripoli's wholesale market. They sold directly to consumers at farmers' markets on a few occasions only, in spontaneous markets organized by FTL, the NGO that supports them.

It should be noted that the above categories are not mutually exclusive, as some ideological producers also sell in Souk el Tayeb and obtain an organic certification to be able to sell their products at higher prices to gain more income, similar to commercial producers. In all cases, these farmers build on their knowledge of organic agriculture, a form of human capital, to deploy livelihood strategies that can enhance their livelihoods. The central role of knowledge for *organic farmers* brings some of them to hire agricultural specialists, in the same fashion that some large-scale farm operations employ specialists (cf Chapter 4). For instance, the farmer group to which Zyan belongs[34] hires foreign specialists with the farmers' common fund to improve their agricultural practices. The fund is capitalized through farmers' sales (for instance, out of the $1,30 income he obtains for selling one kg of oranges, Zyan contributes $0,50 to the fund). This underlines that human and social capitals are essential assets for *organic farmers* to not only to diversify their production methods, but also to increase their income.

[34] Some ideological farmers at Badaro Farmers Market were part of farmer groups, as it is the case with Zyan. Akin to coops, but not registered as such, farmer groups regroup agriculturalists under a common branding, allowing them to consolidate their fruit and vegetable productions under one offering for consumers.

Organic farmers' livelihoods are less vulnerable than those of *conventional farmers*. This reduced vulnerability is in part due to their practices – organic agriculture and permaculture requiring fewer inputs – and their knowledge. As an outcome, they are better equipped to adjust to environmental changes. However, most of this reduced vulnerability is due to their non-dependence on wholesalers when time comes to deliver their products to the consumers. *Organic farmers* most often sell directly to consumers, either to individuals in farmers' markets or with online baskets, and to restaurants and specialized grocery stores. Some farmers sell exclusively by these means, and direct sales provide farmers with a higher income, even though they achieve small yields. This way, organic farmers have higher margins on their products, selling 1 kilo of oranges at $1,30 directly to consumers, instead of selling to a wholesaler for ¢50, allowing more income and thus less financial vulnerability.

Organic farmers' use of direct sales is due to two factors. First, *organic farmers* need to sell directly to consumers to obtain higher profits. As Rahim said: "Wholesale don't care if organic or not" (pers. comm. October 23, 2018). Second, the higher human and social capital levels that *organic farmers* possess allow them to take advantage of opportunities to sell directly to consumers unavailable to *conventional farmers*. Nonetheless, some *organic farmers* cannot forgo wholesalers completely. This is the case for some *ideological farmers* like Rahim who sells some of his production to wholesalers, as he still does not have enough customers to buy all his fruits and vegetables. Building a consumer base is a long process requiring social capital and time. Charles, a young *ideological organic farmer* who spearheads a UA project with Yvonne at a school (cf see Chapter 5), explained in French he has slowly gained customers through being located close to a school and having "un partenariat pour un jardin avec celle-ci qui m'aide à attirer des clients comme des mères qui apportent leurs

enfants" (pers. comm. October 10, 2018). *Developmental organic farmers* for their part remain dependent on wholesalers as they do not possess the social capital and time required to build their consumer base. As these individuals are of lower SES, their precarious livelihoods are not enabling them to independently acquire the social and financial capital necessary to seek better avenues for their products. NGOs' focus on building their knowledge of organic agriculture fails to provide them with the necessary social and financial capital to take advantage of that newly acquired knowledge.

1.3 Investors

Investors constitute a third category of producers. *Investors* were not thoroughly investigated during the fieldwork, and I learned about them mostly through Baqil, who owns an aquaponic business, and Dasia, a doctoral candidate in agriculture. *Investors* are a relatively new phenomenon in the Lebanese agrarian landscape. According to Dasia, they hold a profitability mindset when it comes to agriculture, and only invest in the sector's most profitable activities, such as aquaponic or hydroponic installations. Baqil's experience is a good example, having started his own business in aquaponics and selling to wholesalers, restaurants, and sometime selling at the Badaro Farmers Market. Baqil mostly produces widely used crops that are in constant demand in Lebanon, such as lettuce. He reduces his production during peak seasons and produces more in the low season to increase profit margins. Aquaponic and hydroponic systems require substantial financial investments and the acquisition of human capital only accessible to some individuals of higher SES, but they also consist in lucrative farm systems practised all year round.

This quest for more lucrative activities, which are striving despite urbanization, also favours the emergence of ornamental plant nurseries, as Dasia explained. Plant nurseries have increased in number in recent years in response to an increase in the local and international demands for ornamental plants. *Investors* buy plots of land where *conventional farmer* tenants can no longer make a living due to soil depletion[35], increasing urban pressure, decreasing land surfaces and increasing land prices (Figure 18). Plant nurseries thereby replace plots of lands previously used to grow food, as the former activity is more profitable in an urban context where consumer proximity makes it easy to develop direct sales networks. This is also a phenomenon happening in Oran, Algeria, where an increasing demand for ornamental plants fostered the emergence of plant nurseries in that other urban context (Maachou, et al., 2016).

Figure 18 Top: Plot of land in a recent urban development project in Sin el Fil, denoting strong urban pressure. Plant nurseries replace olericulture in such context, as represented in the bottom picture (a tree nursery in Beirut).

1.4 Waqf

Here I briefly introduce *Waqf*, with information primarily coming from Dasia, the PhD candidate. Waqf properties represent 27% of all land in Lebanon, which makes them important actors in agricultural production. However, *Waqf* do not produce much agricultural commodities themselves, as they mostly produce for personal consumption. This is especially

[35] This is a direct consequence of their insufficient access to agricultural training and other aspects of human capital.

the case for Christian Waqf, as Catholic or Greek Orthodox monasteries use part of the Waqf property to practise subsistence agriculture for tranquility and historical reasons. This is less the case for Muslim Waqf whose properties are more widely used for social purposes such as hosting mosques and schools. *Waqf* achieving agricultural surpluses sell directly on their properties. Some Catholic and Greek Orthodox monasteries are also specialized in wine which they sell and export.

Although *Waqf* are not big producers themselves, they act as important supporters to *conventional farmers* (and to *investors* to a lesser degree). *Waqf* do not provide any kind of training to farmers, and while they rent land at market prices, they offer more advantageous conditions than other landlords. For example, Catholic Waqf often have terms of three, six or nine years with a grace period during which producers do not pay rent, to allow time for agricultural production to become viable. Greek Orthodox Waqf establish lease terms on a case-by-case basis, depending on the type of vegetables and fruits cultivated (or even tree nurseries) and the time span in which specific species become profitable. Thus, *Waqf* help *conventional farmers* to reduce their vulnerability by offering them advantageous land rentals, which increases the opportunity of *conventional farmers*[36] to obtain more financial capital compared to the usual two-three years long leases.

2. Wholesalers

Wholesalers are at the centre of agricultural value chains for fruits and vegetables. Most interviewees currently or previously dealing with wholesalers were quick to point out

[36] I only mention Conventional farmers here as during the fieldwork I did not hear of Organic farmers taking advantage of Waqf leases. My informed guess would lead me to believe that it is because organic farmers, as they are often individuals of higher SES with more financial capital, own the land they cultivate, although that would need confirmation.

their pivotal role in agricultural value chains. Farmers often described wholesalers as having a monopoly on the fruit and vegetable market in Lebanon; several said that they are operating as a "mafia" to the disadvantage of the farmers. The monopolistic position of wholesalers was not only expressed by the numerous farmers I met, but also by NGO employees such as Maya, who was also quick to say that wholesalers were monopolizing agricultural value chains. The vast majority of farmers have no other choice than to accept any offer from wholesalers for their fruits and vegetables as this is most often the only way they can get their products to the consumers.

The price farmers receive for their fruits and vegetables typically represent 40-50% of the final retail price. For example, if a farmer brings one kilogram of oranges to a wholesale outlet, the wholesaler sells the kilo at LL825 (¢55). Wholesalers cash in a 10% commission fee on this amount and give LL750 (¢50) back to the farmer to cover both production and transport costs. Wholesale market customers also pay for transport costs and sell the same kilogram of orange for LL1950 ($1,30) (Figure 19).

	Farmers	Wholesalers	Retail Price
Price of 1 kilo of oranges	LL750 (minus transport)	LL825	LL1950 (minus transport)

Figure 19 Price breakdown for one kilo of oranges

Prices in wholesale markets vary depending on the kind of crops, size of the product and season (Figure 20). For example, 1 kg of cherimoyas sells for LL4000 ($2.66) during off-season periods, but it is valued at LL2500 ($1.66) during the high season. Vegetables and fruits

are sold in one week after arriving to wholesale markets. Those vegetables and fruits are displayed in the wholesalers' outlet where clients such as restaurant owners, shops and retailers will come and buy what they need. Individual customers do not usually have access to wholesale markets, but wholesale markets like the one in Sin el Fil are open to the general public on Saturdays, as unsold vegetables and fruits are discarded on Sundays. Wholesalers pay farmers for the produce sold weekly on the next Monday, minus the outlet's commission fee, which typically ranges from 8 to 10%. Most of the farmers will have to pay a 10% commission fee, more advantageous conditions being only reserved for large-scale farmers.

Figure 20 A farmer bringing some of his production to a wholesaler in Bir Hassan. The price is determined by the weight, size of the crop and seasonality.

Transactions between wholesalers and farmers are based on trust with no safeguards or intervention from the state or the police. Therefore, the farmers have no guarantee that a wholesale outlet did not increase the price of the fruits and vegetables sold and kept the difference, or lie about the quantity sold. This seemed to be a major preoccupation to farmers, especially *conventional farmers* for whom wholesale markets are the only outlet for their products.

Wholesalers have their own outlets in one of the nine wholesale markets located throughout Lebanon. There is one in Tripoli, one in Jbeil, three in Beirut (Dekwaneh (smallest), Sin el Fil and Bir Hassan (biggest)), one in Sidon, one in Tyre and two in the Bekaa valley (in

Ferzol and in Qob Elias (USAID, 2014)) (Figure 21). Farmers bring their produce to wholesale markets either on their own, via damans or by paying movers. Small farmers usually only sell to one local wholesale market to safeguard their trust-based relationship. In contrast, the few large-scale farmers distribute their products in the wholesale markets all over Lebanon.

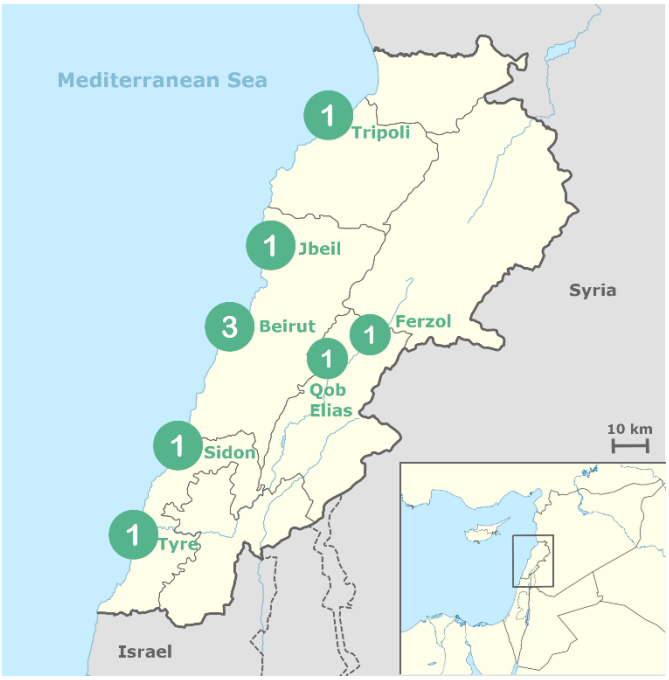

Figure 21: Distribution of wholesale markets throughout Lebanon

Buyers such as local retailers, restaurant and corner shop owners come to wholesale markets to buy the produce they need to be processed or sold to consumers. Buyers often pay movers to bring the fruits and vegetables from the wholesale to their market, an employee at the Sin el Fil wholesale market explained that supermarket chains such as Spinney's come with their own trucks to distribute the products at their supermarket outlets.

Wholesale markets differ in sizes, as some like Dekwaneh and Jbeil are relatively small and only serve as a local distribution points for small retailers. Other wholesale markets such as the one in Tripoli or Bir Hassan are much more important and serve networks of large and small retailers, and restaurants. The size of wholesale markets can affect the volume of fruits and vegetables a farmer can sell there, as small wholesale markets with small-scale clients, such as restaurants and corner shops, sell less produce.

This explains why Rahim, whose story is presented in the introduction of this thesis, switched from selling his products from Jbeil to Bir Hassan. This switch allowed him to

increase his revenue, as he can now sell greater quantities of jujubes and prickly pears at a higher price. He explained that he is now able to trade ten times more jujubes per month Bir Hassan compared to what he used to be able to sell in Jbeil. Likewise, he now sells prickly pears LL5000 ($3.33) a kilo, compared to LL2000 ($1.33) in Jbeil. This price difference, he argued, was due to the wholesaler in Jbeil either lying about the volume of produce sold or the price at which he was selling it. Yet, Rahim's ability to switch between wholesale markets was unique, as the great majority of farmers to whom I spoke said they were always selling at the same market. An ex-wholesaler, Ghasharab, who has been in the business for 17 years shared that small farmers usually sell locally and do not have the possibility to sell elsewhere.

Wholesale markets in Lebanon are organized in a complex network that is determined by how supply and demand unfold in each location. For example, a wholesale employee at Sin el Fil said the fruits and vegetables they sell come from the mountains[37] and from Tripoli, indicating his outlet exchanges products with outlets in Tripoli. Wholesale markets exchange fruits and vegetables between themselves to balance supply and demand in each region of Lebanon, as they each produce different volumes and types of crops. Hence, a wholesaler outlet in Mount Lebanon (outlet 1) requiring maize[38] will get it from a wholesaler outlet in Bekaa (outlet 2) through two different schemes. The first way is that outlet 1 will buy maize from outlet 2, sell it and repay outlet 2, while keeping a commission of 10%. Outlet 2 will then repay his producer, while also keeping a commission of 10%. The second way is that both outlets exchange products of equal value. Therefore, outlet 1 might send 100$ of bananas[39] to outlet 2 while outlet 2 sends 100$ of maize to outlet 1. In both cases, the transactions rely

[37] He was referring to Mount Lebanon.
[38] Bekaa produces maize while Mount Lebanon does not have any maize production.
[39] Mount Lebanon has an important banana production, while Bekaa does not.

on trust, as nothing guarantees that the other outlet will respect his part of such deals that no legal guidelines oversee.

While outside exchanges happen between wholesale markets throughout the country, it is also common that outlets will exchange fruits and vegetables within the same wholesale markets. In those instances, the exchange process is the same as explained above. Exchanges within a wholesale market happen when an outlet needs specific quantities of fruits or vegetables for a client, but its farmers have not provided enough crops. As relationships in the sector are built on trust, not only do farmers tend to sell to the same outlet; clients also tend to buy at the same outlet as well. Wholesalers know their regular customers, which has been demonstrated when Nahla and I went to the wholesale market at Sin el Fil and the first wholesaler to whom we spoke instantly recognized us as newcomers.

Trust-based exchanges can have serious implications for the livelihood of a farmer, as a wholesaler can lie to a farmer about the quantity and the price at which he sold his fruits and vegetables. Wholesaler livelihoods are also vulnerable to such trust-based commercial relations, as Ghasharab explained. This ex-wholesaler who had been in the business for 17 years often lost money by exchanging goods with other outlets that did not pay him back. Combined with a thieving business partner[40] and mismanagement, this vulnerable position put him in debt of LL1,000,000 ($667), forcing him to quit the business.

While they create such risks, trust and close relationships also act as an important source of social capital in agricultural value chains. They notably provide farmers with some

[40] Ghasharab's nephew who introduced me to his uncle shared that specific information after our interview. He explained his uncle considered this as a sensitive topic.

guarantees and predictability about pricing and volumes sold and ensure that wholesalers can constantly stream quality products.

Lebanon's agricultural supply chain can be characterized as a buyer-governed supply chain controlled by wholesalers (Gereffi, et al., 2009). Lebanon's fruit and vegetable value chains are characterized by medium to high power asymmetries in which wholesalers become the gatekeepers between the producers and the consumers. Wholesalers play a central role in price fixing mechanisms, as they dictate transaction modalities with suppliers. Thus, farmers become the wholesalers' captive suppliers, and their relationship is solely based on trust, which represents a major factor of vulnerability for farmers. Nonetheless, such social capital relations act as a vulnerability factor to wholesalers as well, as they too can also be victims of unfair practices.

3. Processors

Processing companies, or *Sociétés* as they are known in Lebanon, are important actors along the Lebanese food commodity chains, but I did not interview any employee working for such institutions. This is due to the fact that I never encountered such actors, and instead interviewed mostly small, artisanal processors selling at farmers' markets. Discussions with those actors reveal vulnerability factors similar to those that producers experience. As with both *conventional* and *organic farmers*, human capital plays a central role in the processor's livelihoods. Also, similar to *organic farmers*, the small-scale processors I encountered seem to fall within three categories; **traditional**, **commercial** and **developmental**.

Traditional processors are those who process food following traditional methods and mostly produce mouneh (traditional Lebanese food products), oils and dairy products. These

processors are mostly organized in cooperatives.[41] They often live in rural areas and have access to a limited registry of processing knowledge. This human capital is, however, well mastered and well integrated, compared to *developmental processors* (discussed below), as the production of mouneh comes from ancestral practices passed down within families. As argued by my research assistant Nahla, *traditional processors* hold great knowledge about their products and their uses, saying: "you know it's a first-hand experience she does that" (pers. comm. October 14, 2018). This mastery indicates a high level of human capital that helps them gain financial capital and make their livelihoods less vulnerable.

Nonetheless, the livelihoods from the *traditional processors* I encountered remain difficult as the small-scale and artisanal nature of their production brings a lot of hardship. Nour, a traditional processor who made various types of mouneh, described the difficulty in producing some of them, including pomegranate molasses. It takes her an exhausting 15 hours to crush the pomegranate and boil them, even with the help of her children and husband. She also explained that all women in her coop must also perform difficult processing activities. The sale of those products at the Souk Jana Loubnan was not very lucrative for Nour, as she said she had to wake up early and drive for two to three hours to the market to only sell a small amount. This comment was also shared by other processors who said they made a small income from selling at the market.

Procurement of fruits and vegetables was not raised as an issue, as *traditional processors* secure their supplies from local farmers at a fair price. [42] This reiterates that social

[41] Farmer and processor cooperatives both operate in Lebanon.
[42] My informed guess is that they pay the same prices as wholesalers, but I could not get confirmation.

capital is a significant asset for actors throughout the value chains to acquire the products around which their livelihoods are centered.

Commercial processors, as their *organic farmer* counterparts, are processors who began to create products in order take advantage of food trends emerging among wealthy Lebanese. Such goods include organic, gluten-free, dairy-free, sugar-free, and/or vegan products appealing wealthier customers (Figure 22 & 23). The branding of these products targets individuals of higher SES, and most of the commercial processors I encountered in Souk el Tayeb displayed product stands where product presentation, design and R&D clearly stood out.

Figure 22 Examples of trendy food products and marketing.

Commercial processors are well adapted to their consumer base as indicated by their well-refined packaging (Figure 23). This demonstrates the ability to use some social and human capital to understand trends and consumers taste. For example, in the case of the pictured chocolate bar, I learned from the chocolate vendor Farghan that this brand and those products were created by a chemist in AUB. According to Farghan, the designer of these chocolates was very careful in creating a product in line with the latest food trends. His profession indicates that

Figure 23 Branding conceived to attract the attention of a food-trendy and wealthy consumer base.

he is an individual of high SES with significant financial and human capital at his disposal to create more complex products.

Developmental processors, as their *organic farmer* counterparts, refer to individuals who learn to process agricultural products through NGO and international organization projects providing training and human capital that can be used to increase one's livelihood stability. Those training initiatives range from making products with carob (a fruit grounded into a powder similar to cacao powder) to oil confections. As with *traditional processors*, the nature of small-scale production also involves intense manual labour and hardship. For example, Foziah, a woman who was taught oil processing through an NGO program, said that it takes her 2 to 15 days to complete a bottle of oil, rubbing the seeds or fruits and using the heat of her hands to extract the oils. When asked if she earned a fair wage, she answered "what in the world doesn't require effort and hard work?" (pers. comm. October 14, 2018), suggesting she received low compensation for her hard work.

Similar to *organic farmers*, processors who acquired human capital through NGOs' trainings seemed to be the least financially wealthy among all processors. Without other means of selling their products, they rely heavily on farmers' markets to get their products to consumers. As individuals of lower SES, they do not possess enough social capital to build networks through which they could sell their products. Hija, a *developmental processor* producing various types of oils, shared that she goes from market to market to sell her products.

Developmental processors do not always master processing techniques as well as their traditional counterparts, even if they produce the same kinds of products. As shared by Nahla, "when I asked that women (Hija) about how I can use this, she's like 'go read it. Go read the

panel (Figure 24)'" (pers. comm. October 14, 2018). Therefore, the acquisition of human capital through external support is superficial, as recipients such as Hija remain reliant on externally provided knowledge. This renders recipients' livelihoods dependent on external actors. Forgetting some of the knowledge they have acquired during the training represents a major factor of vulnerability for those processors. Moreover, as with developmental organic farmers, the trainings do not provide the beneficiaries with social and financial capital to seek better avenues for their products. This incapacity to fully exploit their human capital highlights the limits of the livelihood conversion that NGOs promote.

Figure 24 Panel presenting various uses of different oils.

Conclusion

Actors in agricultural value chains for fruits and vegetables experience different levels of vulnerability, and different factors shape their livelihoods' vulnerability context. *Conventional farmers* are subject to several factors of vulnerability, including their growing dependence on chemical farm inputs, reduced natural capital, precarious financial situations, and their dependence on *wholesalers* as their only option to sell their fruits and vegetables. This vulnerability outlook involves that some *conventional farmers* cannot withstand urbanization. The land they lease is replaced by urban developments or by *investor farmers* who have access to significant financial and human capitals and can invest in more profitable agricultural ventures such as plant nurseries. *Waqf* mostly act as support to conventional farmers, offering them more favourable renting terms and allowing some to reach a better financial standing. *Organic farmers* generally have less vulnerable livelihoods, as they benefit

from greater human and social capital than *conventional farmers*. They are less dependent on chemical farm inputs and most often sell their products directly to consumers, allowing for higher financial returns.

Wholesalers represent a choke point in most agricultural value chains, as shown in Figure 25 depicting agricultural value chains according to my observations on the field. Most fruits and vegetables are delivered and sold to wholesalers before reaching the consumers.

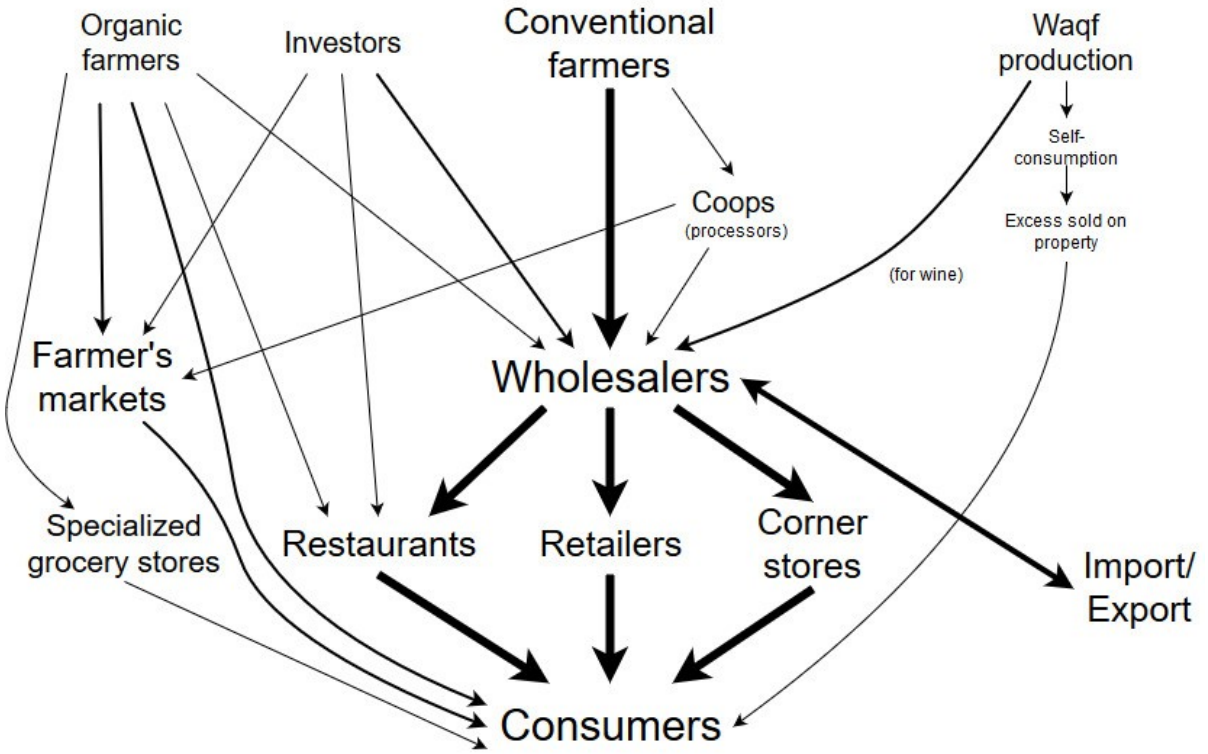

Figure 25 Distribution of fruits and vegetables in Lebanon (Heavy lines denote more important produce flow).

Therefore, wholesalers have a monopoly on agricultural value chains and play a central role in price-fixing mechanisms. However, despite their advantageous role in fruit and vegetable value chains, wholesalers are still subject to some vulnerability factors. Their livelihoods mostly rely on the trust relations they are involved in, making social capital an intrinsic part of these actors' ability to navigate agricultural value chains to sell their products. This reliance on relationships of trust and kinship between actors in agricultural value chains is akin to other cases where a lack of formal regulatory oversight requires participants in commodity chains to trust their business partners (Gerber, et al., 2014; Grillot, 2016). Producers and

clients tend to commit to a specific wholesaler, demonstrating one of the ways in which these trust relations manifest.

Processors share similarities with *conventional* and *organic farmers*. *Commercial processor* livelihoods tend to be less vulnerable as they have high levels of human and financial capital allowing them to develop new products and follow the consumption trends of wealthy consumers. In contrast, *traditional* and *developmental processors* have less human and financial capital and are limited to more arduous and less profitable processing activities. Moreover, they possess less social capital, hindering their ability to take advantage of different market opportunities.

The vulnerability factors that actors in agricultural value chains for fruits and vegetables face seem to vary depending on how they acquired human capital. *Developmental organic farmers* and *developmental processors* were especially vulnerable, as they could only acquire knowledge through NGO programs, which makes those actors' livelihoods reliant on external support. In contrast, individuals of higher SES, such as *commercial organic farmers* and *commercial processors*, are the least vulnerable as their greater access to financial and human capital means that they can easily adapt to changes and innovate to benefit from emerging market trends. Thus, human capital, influenced by the vulnerability context and ownership level of financial, social, natural and physical capitals, is key in shaping the vulnerability of actors in agricultural value chains for fruits and vegetables. Actors with more human capital are able to adapt to changing external factors and demand, allowing them to acquire higher levels of financial capital. Social capital is also involved, as it often correlates with more capacity to achieve direct sales and higher incomes.

The following figure represents value chains for fruits and vegetables in Lebanon. It is inspired by the conceptual framework of this thesis and is adapted to this result chapter (Figure 26).

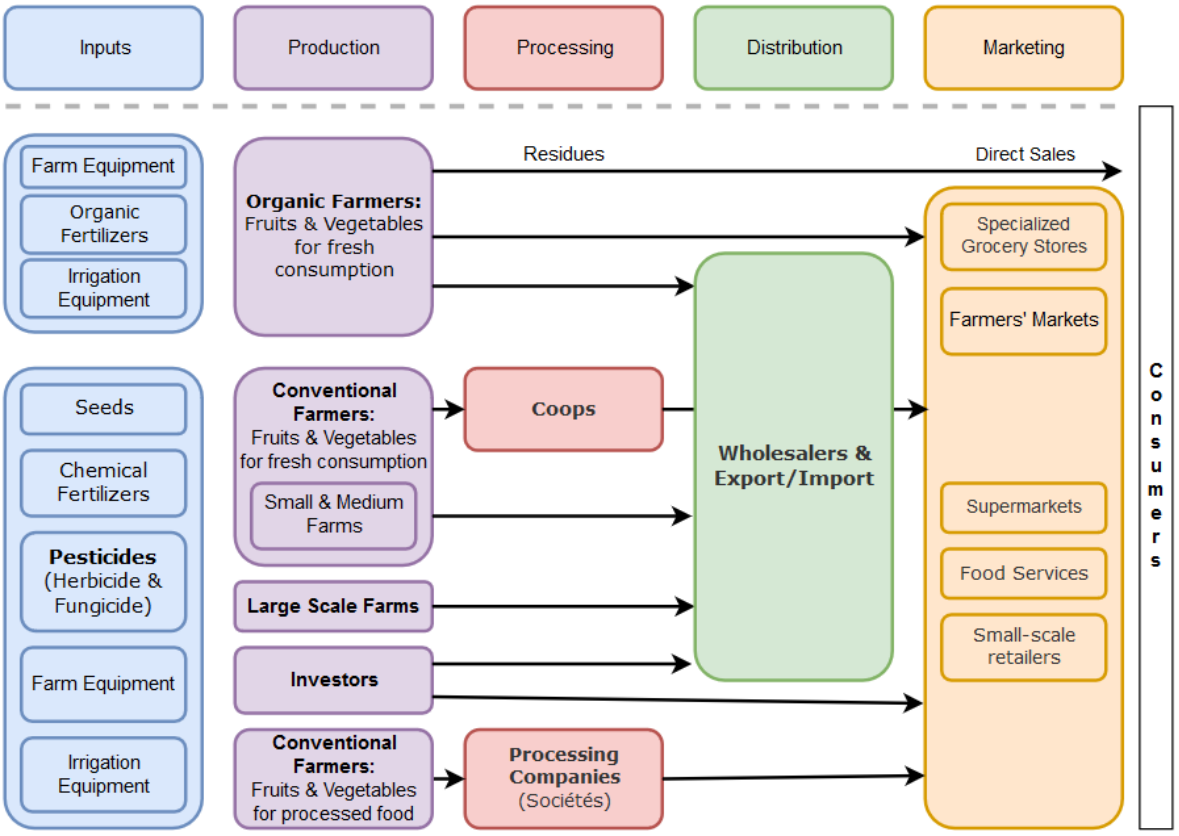

Figure 26 Agricultural value chains for fruits and vegetables in Lebanon

Actors' ability to reach consumers more directly are determined by their level of human, social, and financial capital allowing them to bypass nodes that add costs, and to increase their income and reduce the vulnerability of their livelihoods.

Chapter 7: Discussion & Conclusion

In this thesis, I first assessed if UA is an adequate tool to lower the vulnerability of urban NGO program beneficiaries in Lebanon. Second, I assessed whether or not farmers' ability to navigate fruit and vegetable value chains allows them to reduce their livelihood vulnerability.

My research highlights the vulnerability factors undermining the livelihoods of urban agriculturalists of the studied projects and of various actors in fruit and vegetable value chains. Referring back to my first research question, "Which factors influence the capacity of Lebanese urbanites to undertake urban agriculture?", my thesis reveals that urban agriculture, at least for the studied projects, is not suitable in the Lebanese context, and not an adequate tool to lower urban household vulnerability. UA faces challenges such as limited space availability, 'urban mentality'. As I explained, this notion encompasses: an urban outlook unfavorable to agriculture; the precarious livelihoods of beneficiaries; limited availability of water resources; the ease of simply buying food nearby instead of growing it; lack of individuals' assets; and installations' shortcomings. Due to these challenges, the UA projects on balconies and rooftops achieved low yields and did not provide the participants with an opportunity to lower their livelihood vulnerability.

The vulnerability factors that influence the capacity of urbanites to make the best of the studied UA projects were mainly related to human, physical and natural capital. Difficulties in acquiring the human capital assets necessary for the sustainable practice of UA, and the high financial capital cost to learn and apply such knowledge, greatly reduced the suitability of UA for individuals of lower SES, who are often the targeted population for UA projects. Poor neighbourhoods offer limited space for these projects, and this lack of physical

capital resulted in low yields. Limitation in natural capital, via pest infestations, low watering rates and destruction by the strong sunlight further limited the practice of UA. Those factors were aggravated by the urban mentality toward agriculture, as this social context hindered the acquisition and application of human capital for UA. Therefore, the studied urban agriculture projects are not suitable in the Lebanese context for individuals of lower SES to reduce their livelihood vulnerability as UA fails to provide additional opportunities for them. This is not an exhaustive account of UA prospects and practices in Lebanon and has no generalizing purpose, but the results can potentially give a framework for future research.

My second and third research questions respectively asked, "Which factors influence the commodity chains in which Lebanese farmers partake in?", and "How do these factors influence the vulnerability contexts of farmer livelihoods?", I have found that human, financial and social capitals primarily affect the vulnerability of actors in agricultural chains, which are in rural contexts this time. Human capital dictates the ability of producers and processors to adapt to changing conditions and to switch to production methods that increase their income and reduce their livelihood's vulnerability. However, the acquisition and the use of human capital is greatly dependent on the financial capital available to producers and processors. Social capital dictates the ability to build networks and to establish relationships that influence producers', wholesalers' and processors' opportunities to find outlets for their products and to maximize their income. As a result, individuals of lower SES including *conventional farmers*, *development organic farmers* and *developmental processors* possess the lowest human, financial and social capital levels, and are the most exposed to vulnerability factors such as price fluctuations, urbanization, dependence on chemical farm inputs, precarious financial situations and environmental degradation. Their livelihoods are highly

dependent on external actors and they have the least ability to adapt to external stressors, and few opportunities to increase their incomes. Individuals of higher SES, including *ideological* and *commercial organic farmers*, *investors* and *commercial processors*, are the least vulnerable as they hold high levels of human, financial and social capital. They can therefore easily adapt their practices in response to external changes or stressors, bypass middlepersons, and earn higher incomes.

Vulnerability factors such as price fluctuations and dependence on wholesalers can breed especially devastating impacts on individual livelihoods as there are no public safeguards, and state authorities' interventions are very rare. Thus, transactions between any actors in the value chain are based on trust. The monopolistic position of wholesalers and the bottleneck they represent in agricultural value chain is not unique to Lebanon and can also be found in Western countries (Gereffi, et al., 2012). Yet, the commodity chain actors with lower SES I encountered in Lebanon were particularly concerned about their over-reliance on the wholesalers with whom they maintained trust-based relations. The mutual dependence at play in such contexts is filled with uncertainties, such as unregulated border trades or markets, and the absence of direct connections between suppliers and buyers creates misunderstandings that result in anxiety (Grillot, 2018).

The reliance on trust also means that social capital stands out as a particularly important asset within commodity chain actors' livelihoods. Individuals of higher SES are more able to build their social capital as they can invest time and effort to establish business relationships and to benefit from business opportunities (Gerber, et al., 2014; Turner, et al., 2015). Individuals of lower SES have lower social capital and they cannot dedicate as much time and effort to establish business relationships. They are more at risk of being taken

advantage of while negotiating the complex relationships that make up agricultural value chains for fruits and vegetables, resulting in higher livelihood vulnerability.

My results show that the studied agricultural activities are shaped by different livelihood assets and underline the multifaceted vulnerability factors that urban and rural agricultural practitioners face in Lebanon. The main vulnerability factors vary between agricultural activities. Physical and natural capital are central in urban agriculture, while social and financial capital play more important roles in agricultural value chains happening in rural context., Although all livelihood capital impacts the outcomes of those activities in both instances, human capital appears to act as a core vulnerability factor in both sectors, even though different types of knowledge are valued in different agrarian sectors.

Yet, there are also important similarities between both cases. While both the UA and fruit and vegetables value chains were meant to benefit people of lower SES, they were ultimately more suitable for individuals of higher SES, and did not decrease the livelihood vulnerability of lower SES individuals. This is due to the fact that they do not own sufficient financial capital and human capital, being first and foremost preoccupied with making a living on a daily basis. The government's attitude toward agriculture also comes into play here, as little support and few training opportunities are available for individuals with low SES. These actors therefore have little chance to acquire the critical human capital they need to enhance their livelihoods. This attitude toward agriculture is not unique and relates to long-term biases against farming globally, and particularly in the Global South. Agriculture, especially smallholder agriculture, is seen as 'backward' compared to other economic activities, as it is understood to generate little profit and receives little interest from governments (Bryceson, 2000). Agricultural policies centred on smallholder farmers require that governments devote

important investments towards agricultural research, innovation and agricultural extension (Bryceson, 2000). Yet, this is something that countries in the Global South seldom achieve, as they are more eager to modernize their economy and industrialize their agriculture, at the expense of smallholder farmers (Bryceson, 2000).

There are also differences in how knowledge is acquired and in its impact on providing additional livelihood opportunities. In the case of processors, ancestral knowledge is fully passed down through generations whereas the knowledge of processing methods learned through NGO seems less mastered. This indicates that external support might not significantly help individuals to properly acquire knowledge and do not provide the necessary financial and social capital necessary to allow for individuals to mobilize this knowledge and expand their livelihood opportunities. This would explain why the livelihood from *developmental organic farmers* and *developmental processors* were the most vulnerable. Likewise, the lack of full integration of knowledge by the recipients of UA projects is possibly due to the fact that external actors provided the knowledge. NGOs train UA participants in ways that do not allow them to completely master the knowledge, which in turn does not allow them to expand their livelihood opportunities. Thus, not only is human capital necessary for individuals to improve their livelihoods and reduce their vulnerability, but it must also be fully integrated in order to be helpful.

There are limitations to my study, and further research could add to the knowledge presented in this thesis. First, the UA component of my research has failed to introduce any recipients of any of the studied UA projects. Even if these individuals were no longer practising urban agriculture, obtaining feedback about their experiences with UA might have revealed

other factors that were not taken into account by the NGO employees, or might have allowed me to highlight the challenges they faced with more nuance.

Second, my scrutiny of agricultural commodity chains has failed to take into account storage, cold storage and sellers, as I did not have enough data to assess the vulnerability context of the individuals involved in these activities. I mostly focused on producers' and processors' livelihoods and how they deal with wholesalers. Thus, even if I mapped agricultural value chains to display how fruits and vegetables reach the consumers, I did not consider the vulnerability factors of actors selling the products to end consumers or supporting the agricultural value chains by stocking products. Sellers indeed cope with a specific vulnerability context. For instance, my observations indicate that small retailers are in competition with supermarkets, which are becoming more and more prevalent in Lebanon as well as in the Global South in general (Gereffi, et al., 2012; Peyton, et al., 2015; Reardon, et al., 2006). Notably, small retailers do not benefit from the economies of scale and robust supply chain supermarkets maintain.

In conclusion, despite the multifaceted vulnerability contexts and the influence of all livelihood capitals, the livelihoods of urban agriculturalists, farmers and actors in fruit and vegetable value chains are centred on access to human capital. Human capital fosters the efficient use of, and increased opportunities to gain the natural, physical and financial capitals necessary to reduce vulnerability to sustain individual livelihoods. Decreasing agricultural activities in Lebanon, the heightened pressures of external stressors such as climate change and urbanization, and further integration into global markets all put farmer livelihoods at risk. In that context, the maintenance of agricultural actors' livelihoods mostly depends on the acquisition and mastery of human capital, central reducing their livelihood vulnerability.

ANNEX I

Sets of guideline questions acting as themes used during more formal interviews with slight variations depending of the interviewee targeted

03/10/2018 *Can you speak about what you do?* *How did you end up with your garden?* *Did the food heritage foundation made any claim?* *Reflection on the involvement process* *Guidance provided by foundation?* *Help of participants?* *Impact on water use, water insecurity* *have you seen a change in water availability in the last years?* *How feasible would it be for your target demographics* *Any people doing it?* *Is it easy/difficult to sustain?* *How well is suited for Lebanon?* *Difficulties with the weather? Changes in weather?* *Yields? Impacts on expenses and nutrition?*	**08/10/2018** *Can we meet the beneficiaries to ask about their experiences?* *Can you speak about what you do?* *How did you end up with your garden?* *Did the food heritage foundation made any claim?* *Reflection on the involvement process* *Guidance provided by foundation?* *Help of participants?* *Impact on water use, water insecurity* *have you seen a change in water availability in the last years?* *How feasible would it be for your target demographics* *Any people doing it?* *Is it easy/difficult to sustain?* *How well is suited for Lebanon?* *Difficulties with the weather? Changes in weather?* *Yields? Impacts on expenses and nutrition?*
22/10/2018 *Can you speak about what you do?* *How did you end up with this project?* *Did the food heritage foundation made any claim?* *Reflection on the involvement process* *Guidance provided by foundation?* *Help of participants?* *Impact on water use, water insecurity you have seen?* *How feasible would it be for your target demographics* *Any people still doing it do you think?* *Is it easy/difficult to sustain?* *How well is suited for Lebanon?* *Yields? Impacts on expenses and nutrition?* *Challenges related to space and knowledge?*	**23/10/2018** *Can you speak about what you do?* *How did you end up with this project?* *What did your initial assessment of the project told you?* *Did the food heritage foundation made any claim?* *Reflection on the involvement process* *Guidance provided by foundation?* *Help of participants?* *Impact on water use, water insecurity you have seen?* *How feasible would it be for your target demographics* *Any people still doing it do you think?* *Is it easy/difficult to sustain?* *How well is suited for Lebanon?* *Yields? Impacts on expenses and nutrition?* *Challenges related to space and knowledge?*

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