AMERICAN UNIVERSITY OF BEIRUT

EXPLORING THE POTENTIAL ROLE OF URBAN AGRICULTURE AS A COMMUNITY ENGAGEMENT STRATEGY IN UNIVERSITIES DURING A FOOD SECURITY CRISIS: THE AMERICAN UNIVERSITY OF BEIRUT AS A CASE STUDY

by

MELODY GHASSAN TAMER

A thesis
submitted in partial fulfillment of the requirements
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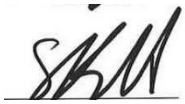

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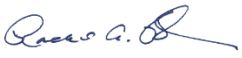

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ABSTRACT
OF THE THESIS OF

Melody Ghassan Tamer for Master of Science
Major: Food Security

Title: Exploring the Potential Role of Urban Agriculture as a Community Engagement Strategy in Universities During a Food Security Crisis: The American University of Beirut as a Case Study

In light of the compounded crises Lebanon has been going through since 2019, food security concerns have increasingly grown amongst Lebanese people who have resorted to an array of coping strategies. The economic downfall and the consequent depreciation of the Lebanese pound (LBP), hyperinflation, decreasing purchasing power, COVID-19 pandemic, and the 4th of August, 2020 Beirut Port explosion have complicated the life of locals and exacerbated the governmental void. Urban agriculture (UA) became an attractive solution for locals who wished to increase their food intake, or even obtain produce without resorting to a hyperinflated market. Local initiatives have burgeoned in Lebanon sporadically but have created local knowledge hubs in some neighborhoods where interest in UA has grown. UA has been employed as a coping strategy in areas hard-hit by crises, like Cuba and Palestine, where results and efficiency depended on legitimacy, governmental support, and availability of urban land. In the global north, UA has been employed by several university campuses as a development and sustainability strategy for neighboring communities. This research exercise uses an extensive literature review of the previously mentioned examples, as well as a thorough analysis, to generate recommendations for the American University of Beirut (AUB) to achieve an effective UA community engagement strategy as a crisis response in Lebanon. The findings show a considerable potential for this to happen, given proper governance, agency, and dissemination of UA knowledge and principles.

TABLE OF CONTENTS

ABBREVIATIONS

AREC: Agricultural Research and Education Center

AUB: American University of Beirut

CCECS: Center for Civic Engagement and Community Service

CSA: City Strategic Agenda

ECO UNIT: Ecological Unit

ESCWA: Economic and Social Commission for Western Asia

ESDU: Environment and Sustainable Development Unit

FAFS: Faculty of Agricultural and Food Sciences

FAO: Food and Agriculture Organization

FHF: Food Heritage Foundation

FStT: From Seed to Table Program

GDP: Gross Domestic Product

ILO: International Labor Organization

IPES: International Panel of Experts on Sustainable Food Systems

ISDR: International Strategy for Disaster Reduction

ITS: Informal Tented Settlements

KARIA Net: Knowledge Access for Rural Inter-connected Areas Network

LBP: Lebanese Pound

LDEM: Landscape Design and Ecosystem Management

LGU: Land Grant Universities

LLWB: Lebanese League for Women in Business

MENA: Middle East and North Africa

MPAP: Multi-Stakeholder Action Planning and Policy Formulation

NGO: Non-Governmental Organization

NI: Neighborhood Initiative

OCHA: Office for the Coordination of Humanitarian Affairs

SDG: Sustainable Development Goals

SME: Small and Medium Enterprises

UA: Urban Agriculture

UC: University of Colombia

UN: United Nations

UNDESA: United Nations Department of Economic and Social Affairs

UNHCR: United Nations High Commissioner for Refugees

UNICEF: United Nations Children's Fund

USA: United States of America

USD: United Stated Dollar

USSR: Union of Soviet Socialist Republic

WFP: World Food Programme

YASAD: Yemen Association Sustainable Agriculture Development

CHAPTER I

INTRODUCTION

With the projected growth of the world population to reach over 9 billion by 2050, the need to ensure adequate access to food and guarantee the smooth operations of food supply chains is crucial. Of the projected 9 billion people, 71% of them are expected to live in cities as compared to the current 58% urban population (UNDESA, 2019). In countries where hunger and food insecurity are pervasive, various counter strategies need to be efficiently implemented to provide essential nutrition to everyone. One common contingency plan adapted by urban communities and often encouraged by governments is to promote and intensify local food production in order to mitigate the devastating effect of global food shocks and food price volatility (Galhena, Freed and Maredia, 2013). "Urban agriculture (UA) is defined as all forms of agricultural production (food and non- food) occurring within or around cities" (Wagstaff and Wortman, 2015). UA includes an array of different farming practices like outdoor urban gardens and farms, hydroponic systems, rooftop gardens, landscaping and nursery industries, and urban livestock (Little, 2019). This research will focus on the UA initiatives as a response to the compounded crises in Lebanon, particularly the potential of the American University of Beirut (AUB) to provide support to the community in times of crisis.

Economic access to food has been hindered in many cities due to the increasing poverty rates. In some developing countries, 60% of the income of the urban poor is spent on food. Physical access to food has also been in jeopardy due to poor infrastructure for

efficient food transportation from farms to the cities causing 10-30% of produce to spoil in transit (FAO, 2005). In the Middle East and North Africa (MENA) region, population growth is drastically increasing in urban areas as people abandon agriculture as a main livelihood and move to the city in search of a stable income. This phenomenon decreases the rural agricultural labor force as well as arable land due to the expansion of cities, and negatively affects the volume and variety of produce from the same country, increasing reliance on imports (Mirkin, 2010).

In proximity to urban centers the procurement trends of agricultural goods are different from what they used to be in rural areas. Multinational corporations, like supermarkets, engaging in long food supply chains will have a more prominent role in supplying food to the urbanized population (Satterthwaite et al., 2010). This modernized system will favor mechanized, large-scale farming and will provide non-local agricultural produce to the market (Kennedy et al., 2004). This also entails a change in job opportunities within the food system, with fewer rural job opportunities related to agriculture and more urbanized jobs to sustain the food supply chains like transportation, wholesaling, retailing, and food processing (Cohen and Garrett, 2010). Within the urban food system, demand has shifted from labor-intensive agricultural products to more convenient imported food coming from capital and energy intensive agriculture (Satterthwaite et al., 2010).

Even though urbanization is normally linked to economic growth, this does not ensure that all urban residents equally experience food security (Satterthwaite et al., 2010). A study conducted in 10 Sub-Saharan African countries showed that, in nine of the countries, 40% of all urban dwellers suffered from energy deficiency, and in three countries a staggering 60%

of the urban population did not consume enough calories for sustenance (Ruel & Garrett, 2004). The coping mechanisms that many low-income urban households practice to prevent food insecurity have a negative effect on their health and nutritional status (see Maxwell et al., 1998; Tolossa, 2010). However, UA has been shown to be a positive coping mechanism for many urban households as it provides a small yet steady source of income, allowing an increased access to food products from the market and creating a relatively diversified diet. In this way, UA helps prevent food insecurity, malnutrition, and hunger (Satterthwaite et al., 2010).

In the year 2020, the world saw one the most severe health crises in 100 years. The COVID-19 health emergency has created an economic recession, and is rapidly aggravating an ongoing food security and nutrition crisis in the world (IPES-Food, 2020). As progress towards achieving Sustainable Development Goal (SDG) 2: Zero Hunger, by the year 2030 is not happening as quickly as expected, the COVID-19 pandemic is exacerbating the weaknesses and shortfalls of the global food system. Activities related to the production, distribution and consumption of food have been affected by the lockdowns imposed to prevent transmission of COVID-19. The *State of Food Security and Nutrition in the World* report estimated that between 83 million and 132 million additional people would experience food insecurity or even hunger in 2020 as a result of the economic collapse triggered by COVID-19 (FAO, 2020).

The *Regional Overview of Food Security and Nutrition in the Near East and North Africa* (FAO, 2020b) estimated that, even though the region had witnessed significant improvement in access to food as well as stunting and nutritional diseases rates, 13.2% of

the current population, amounting to 55 million people, were hungry and faced some level of food insecurity as of 2019. That is mainly due to the conflicts, wars, and violence leading to economic depression, particularly in Iraq, Libya, Syria, Sudan, Lebanon and Yemen (FAO, 2020b).

Apart from the COVID-19 outbreak, Lebanon has been going through several combined crises; an economic and financial crisis that erupted in October 2019, followed by a total lockdown due to the COVID-19 first imposed in March 2020, and finally the devastating explosion at the Port of Beirut in August 2020 (World Bank, 2020).

The aforementioned crises and the consequent collapse of the Lebanese pound (LBP) have made food insecurity a dangerous reality for vulnerable Lebanese and refugees. 85% of Lebanon's food supplies are imported (Relief Web, 2020). They are priced and bought in United States dollars (USD) from international suppliers and they are primarily delivered through Beirut's port. Since the explosion on August 4th, 2020 destroyed parts of the Port of Beirut, and since the LBP rates are tumbling against the USD making imports very complicated and costly, food security is in jeopardy. Between March 2021 and March 2022, the Consumer Price Index increased by 208.13% while all food prices increased by an astounding 396% between November 2019 and November 2020. Data showed that the sales of luxury foods decreased by 56%, while the sale of basic food stuffs like cereals, pasta, sugar, and rice had increased by 105% (Hamadé, 2020).[1]

[1] Figures obtained in November 2020

Lebanon is considered one of the most urbanized countries in the region, with 87% of its population living in urban areas and an estimated 64% residing in either Beirut or Tripoli, the two main coastal cities (UN Habitat, 2015). Considering that Lebanon is highly urban in nature, UA is theoretically a particularly attractive solution in ensuring adequate food supplies in response to these compound crises. Lebanese politicians, prominent public figures, as well as local and international Non-Governmental Organizations (NGO) have launched several campaigns promoting UA as a means to mitigate the looming threat of food insecurity (Sauma, 2020). In early 2020, this initiative was promoted by the well-known Lebanese director Nadine Labaki who motivated people to reconnect with nature through the "Zari'et Albi" initiative which literally means "the plant of my heart". This campaign was in coordination with various NGOs and programs endorsing sustainable and organic agriculture like Beit el Baraka, Ardi Ardak, AUB Environment and Sustainable Development Unit (ESDU), Regenerate Lebanon, Agronorte, and Buzurna Juzurna (Rahhal, 2020b). Even prominent Lebanese politicians have promoted UA in their speeches. The Secretary General of Hezbollah even went so far as to declare an "Agricultural Jihad" inciting people to start planting their own food. This could be considered as a clear indication that the authorities have no solution for the imminent economic collapse and are recruiting the Lebanese people to solve a problem that they had no idea was coming and are in no way prepared to face (Sauma, 2020).

With the increase of food prices across all the different size retailers and the deteriorating living conditions in the country, the Lebanese people took it upon themselves to find ways to save on the cost of food, so some households started urban agriculture

(Tawfic, 2020). Several households got on board by either planting small potted herbs on their balconies or repurposing their terraces or roofs into a vegetable garden or a small fruit orchard. The macro-level rationale behind this is to potentially limit the imports of foreign products and ensure a more stable food system that is not reliant on foreign currencies; at the household level, the main goal would be to save money on food expenditures and to stay active during COVID-19 lockdowns.

Apart from personal initiatives, academic institutions have historically contributed to the wellbeing of the surrounding community during crises. In Beirut and its suburbs as well as in the Bekaa Valley (Lebanon's agricultural heartland), AUB has been a long-standing knowledge hub and has contributed in the enhancement of the community around it as one of the largest and most influential academic institutions in the MENA region (Sinno, 2020). AUB was able to adapt its community service methods to the economic and political conflicts during and after war and conflict. Over the years, AUB has developed programs and services that put the Lebanese population at the center of their intervention. These programs include the Center for Civic Engagement and Community Service (CCECS) established in spring 2008, the Neighborhood Initiative (NI) launched in 2007, and the ESDU established in 2001 by the Faculty of Agricultural and Food Sciences (FAFS) ("AUB", 2001).

In the 156 years since AUB was founded, many important events happened that make up Lebanon's history. AUB has lived and contributed to these events in all the social, economic, and environmental aspects. Since October 2019, there has been several events that have caused a decline in the Lebanese quality of life. Lebanon is currently in the midst of the steepest economic decline it has ever witnessed: According to the World Bank's *Lebanon*

Economic Monitor, this crisis will most likely rank in the top 10, and possibly three, most severe crises episodes globally since 1900 (The World Bank, 2021). With half the population below the poverty line, and 41% of households facing difficulty accessing food and other basic necessities, it is reasonable to ask how AUB can contribute to cushion this economic freefall. This research thesis will explore the potential of the AUB to implement UA as a community engagement strategy on its premise to benefit the population suffering from the current food security crisis.

The main objectives of this research are (1) to map the various relevant UA initiatives on different campuses in the world and their impact on the community; (2) to describe the UA phenomenon that emerged after the COVID-19 pandemic and economic collapse in Lebanon; and (3) to develop a model for AUB to create a community gardening space that would benefit its neighboring, vulnerable community. This study is based on an extensive literature review and analysis of the different UA initiatives that existed before the pandemic on different campuses and in different vulnerable areas around the world, as well as those that were established as a response to COVID-19. The literature review gives insight on all the UA activities that emerged in Lebanon especially after the popular revolution in October 2019, and on their efficacy in enhancing food security. Based on the findings from the literature review and analysis, this study develops a model for an UA Ecosystem based at AUB with the support of the ESDU. This initiative aims to provide the most vulnerable inhabitants with livelihoods at the UA plots at AUB along with strengthening the bond between the community and the university and provide much needed produce for consumption.

CHAPTER II

RESEARCH QUESTION AND OBJECTIVES

A. Research Question:

How can the AUB help in ensuring food security to the surrounding community through its community engagement programs during the compounded crises that started in 2019?

B. Research Objectives:

- To map the various UA initiatives on different campuses in the world and their impact on the community.
- To describe the UA phenomenon that emerged after the pandemic and economic collapse in Lebanon.
- To develop a model for UA tailored for AUB to fulfil the needs of the community.

CHAPTER III

METHODOLOGY

This research thesis relies on secondary data derived from previous research on topics related to campus community engagement initiatives around the world, as well as data pertaining to food security and UA in the crises' context in Lebanon. The purpose of the secondary data is to review existing literature on community engagement practices on campuses around the world and to compare and analyze the similarities and differences with the efforts of the AUB in the context of the compounded crises Lebanon is currently going through. The literature review also explores the UA phenomenon that emerged in Lebanon in the past two years and ways that AUB can harness this knowledge and disseminate it to the community around it. The research relies on a critical analysis of the literature review findings to answer the three research questions proposed. Based on the literature review and the lessons learnt from other campus community gardens, the final output of this research thesis is a model for the Eco Unit, AUBotanic and other programs at AUB to maximize campus resources and provide support in ensuring food security to the community around it.

The methodology of this study relies mainly on extensive literature review, analysis of the findings, and potential ways to extrapolate the results to the Lebanese context while bearing in mind the limitations and peculiarities of the current Lebanese landscape. The information was retrieved using a snowballing method where sources were obtained by reading and analyzing references from initial research papers.

The literature review lays out the details related to UA, its definition, the means for implementation, and its effects on the environment and the people who practice it. An exploration of urban agricultural interventions during crises times worldwide and in Lebanon lays out the pros and cons, as well as the limitations and advantages of choosing UA as an emergency response to mitigate and counter the adverse effects of economic, health, or political crises.

To put things in perspective, a thorough analysis of the Lebanese context is explained in this manuscript. The literature review covers the economic crisis along with the subsequent devaluation of the LBP, hyperinflation, and the decrease in importation of goods due to reduced purchasing power. It also explores and analyzes the effects of the COVID-19 pandemic and related lockdowns, and the lagging supply chains on the Lebanese economy and on the people. The 4th of August, 2020 Beirut Port explosion and its effect on the capital, the main port of the city, and on the wellbeing of the Lebanese people is laid out. To understand the depth and urgency of urban agriculture as a response, a thorough analysis of food security, in all its aspects - access, availability, utilization, and stability - is analyzed in the current Lebanese context. An exploration of the state of UA before the crisis in Lebanon and after it serves as an indicator of the people's willingness to invest their money and time in UA as a response to the compounded crises.

This research considers examples of UA as a crisis response in areas in the global south: Cuba, Amman in Jordan, and the West Bank and Gaza in Palestine. These areas were particularly chosen after expert recommendations, the choice was consolidated after finding

numerous references and research papers about UA in these three regions that reinforced the relevance of choosing these areas as a comparative base for Lebanon.

This research adopts a case study approach, considering the case of AUB and its relevant local communities. AUB is home to several institutions that are well versed in agriculture, sustainability, and development, with initiatives and organizations like the ESDU, AUBotanic, CCECS, and other student led clubs that promote UA and disseminate knowledge and expertise to those interested in learning, no matter the reason, be it for sustenance or for fun. This is why this study will consider the AUB as the main institution to organize, plan, and execute community engagement programs, with a focus on UA, to contribute in reinforcing food security to the surrounding community due the imminent compounded crises.

CHAPTER IV

BACKGROUND

A. Urban Agriculture:

UA encompasses an array of different farming practices like outdoor urban gardens and farms, hydroponic systems, rooftop gardens, landscaping and nursery industries, and urban livestock (Little, 2019). The supposed benefits of UA are many: UA enhances many environmental aspects, such as improving human health, food access for local communities, income and jobs along with economic prospects, education about farming, and community resilience (Oberholtzer et al., 2014; Santo et al., 2016; Thomas, 2014). Practicing UA privately or as part of a community carries social and environmental benefits. It improves public health and community food security, and offers economic development opportunities (Santo et al., 2016). Urban farming has increased social inclusion and reduced gender inequalities; globally, 65% of urban farmers are women. Ecologically, UA reduces city waste, improves urban biodiversity and air quality, and reduces the environmental impacts of food transportation and storage (Orsini et al., 2013). Its contributions to food security, nutrition and livelihoods are highly beneficial and especially needed in times of crisis. UA provides families with fresh produce for self-consumption, contributing to a healthy and diversified diet and allowing for saving on food expenses. UA is also a source of income for families who sell the surplus to local markets thus providing fresh and micronutrient rich foods at competitive prices for the whole community (FAO, 2008).

By definition, a home garden is an agricultural system merging different physical, social and economic functions on family land or a small plot around the house. This allows

convenient and continuous access to food, leading to a diversified and balanced diet made up of fruits, vegetables, and herbs providing essential proteins, vitamins, and minerals for a healthy life. Tending to a home garden improves people's health and wellbeing due to the increased physical activity needed to maintain the land plots (Galhena et al., 2013). On a smaller scale, home gardening has recently gained popularity all over the world due to the disruptions caused by the COVID-19 pandemic to the food supply chains worldwide. Some have started home plots in fear of food shortages, and some others consider it a therapeutic practice in the midst of all the chaos and uncertainty (Evans and Davies, 2020).

While the positive impacts of UA on food security and nutrition are reported to be many, there are limits to these impacts. Some research shows that UA does not have a significant positive impact on the daily intake of food for the urban poor (Badami & Ramankutty, 2015). Researchers argue that UA is not a cure-all that will instantly procure social, environmental, and economic benefits to those who practice it. Rather, a proper policy framework should be put in place for UA to actually be beneficial (Siegner, Sowerwine & Acey, 2018).

B. UA Efficiency in Crisis:

The resilience of food systems is put to the test when faced with unpredictable crises that create economic instability and consequently market shocks, jeopardizing food security. International markets are susceptible to internal supply chain shocks and external economic shocks affecting prices and market contribution. An example of such crises is the COVID-19 pandemic, which triggered lockdowns and travel bans that consequently limited the

necessary movements on which the global food systems vitally rely and disturbed food supply chains (Hoza Ngoga & Delbridge, 2020).

Since the start of the COVID-19 pandemic, food prices have soared in some parts of the world due to factors including gaps in supply and demand as well as behaviors including panic buying. Some countries implemented export restrictions on their own produce to secure internal food supply for their own population which disrupted the global food market at first (Sova & Man, 2021). This phenomenon of rising prices has been compounded with many people losing their source of income and thus facing reduced purchasing power (Haas, 2020). The COVID-19 pandemic has caused disruption in trade and distribution, consequently exposing the importance of local and short food supply chains requiring less transport distances, low storage costs, and a providing a variety of fresh foods during times of crisis (FAO, 2020c).

History has shown that community gardens have provided much needed support to communities affected by political and economic instabilities. During the industrial revolution, allotment gardens were developed in response to food shortages (Barthel, Parker & Ernstson, 2013). During the first World War, the American people were motivated by their president to plant "Victory Gardens" aiming to avoid food shortages. This trend came alive again during the second World War with people tending to vegetable gardens in their backyards and setting up community gardens in schoolyards or on unused land, and even planting the front yard of the White House with fruits and vegetables (Chandran, 2020). Then after the second World War, community gardens were created in response to environmental and economic problems, most importantly, food safety issues and an increase in food prices

(Firth, Maye & Pearson, 2011), and to political instabilities, such as the 1973 oil crisis (Bell, 2018) or due to the disintegration of the Union of Soviet Socialist Republic (USSR) (Altieri et al., 1999). Community gardens also play an important role in providing support in underprivileged neighborhoods (Yotti' Kingsley & Townsend, 2006).

Amid COVID-19 and similar crises, urban gardening and other UA practices have proved to be vital safety nets for many low-income urban residents, providing households with essential produce for daily consumption and storage by pickling or freezing. In addition to household consumption, households can benefit from the extra income generated by the selling of the produce of urban gardening and using this money to buy other essentials to survive these crises (Hoza Ngoga & Delbridge, 2020). However, these practices will never be a stable foundation for national food security. Considering how scarce and expensive urban land is, it will not be able to provide enough affordable food to ensure food security to everyone like mass rural agriculture can (Collier, Blake & Manwaring, 2018).

In order for UA to be a practical solution to increasing the resilience of urban populations to economic shocks such as that caused by COVID-19, it has to be considered as a legitimate solution (Hoza Ngoga & Delbridge, 2020). For example, in Sierra Leone's capital, the Freetown City Council included urban farming as a central part of the COVID-19 preparedness and response plan with the goal of increasing resilience in informally settled communities during lockdowns. The Freetown City Council have provided training extension officers, and have also distributed vegetable seeds, planting containers like pots or tires, tools, and soil (Freetown City Council, 2020).

In Lebanon, however, UA gained popularity because of the tough economic situation and due to the fact that the Lebanese people needed to find ways to secure food, along with the help of some local NGOs and TV campaigns. There were no extension programs or policies studied and implemented by the government to encourage UA as a methodical way to get over the looming crises with a clear exit plan to help the Lebanese survive on the long run since UA is not a long-term viable solution to household food insecurity (Tawfic, 2020).

C. Crises History in Lebanon:

Since October 2019, Lebanon has been experiencing multiple social, economic, political, and health crises. These have drastically exacerbated poverty in the country and have resulted in growing unemployment, closure of businesses, currency devaluation, among other adverse outcomes. Livelihoods, in particular, have been severely impacted by the economic crisis, the COVID-19 pandemic and multiple rounds of stay-at-home measures, curfews, and other restrictions.

The 17th of October, 2019 was a turning point for the Lebanese people with the start of a popular revolution. After this day, several crises have snowballed and were exacerbated by the COVID-19 pandemic, and the explosion at the Port of Beirut in August 2020. In October 2019, the economy plummeted, capital inflows suddenly stopped and a financial crisis was fully fledged consequently triggering general failures across the banking sector and debt sector, and affecting the LBP – USD exchange rate that had been pegged since 1997 (Furness, 2020). On March 18, 2020, the Lebanese government declared a state of emergency and imposed a total lockdown in an effort to control the spread of COVID-19. The lockdown

comprised the complete closure of the air, sea, and land borders as well as the closing of all public and private organizations, the lockdown ended in June 2020 with the resumption of all transportation and transit activities. On August 4, 2020, a devastating explosion ripped through the Port of Beirut damaging a great part of it along with homes, offices, and institutions in a 3 km radius around the blast (World Bank, 2020). The fact that these catastrophes have all happened in a span of one year has made it very difficult to discern the effects they each have. The state of agriculture in regards to these crises is in danger, and the government's response has been weak (Hamadé, 2020).

D. Pre-Crises:

1.The State of Food Security in Lebanon:

In the period before October 2019, Lebanon's economy was seemingly stable due to the pegging of the USD at approximately 1500 LBP. In 2015, it was estimated by the FAO that 1,350,000 people in Lebanon were in need of food; 83% are Syrian refugees, 13% are Lebanese, and 3% are Palestinian refugees (UNHCR, WFP & UNICEF, 2015). In 2018, it was shown that 42.2% of Lebanese households with children, aged 4 to 18 years, experienced moderate-to-severe food insecurity due to lack of access to food (Jomaa et al., 2018). In 2019, people below the extreme poverty line spent 51% of their incomes to buy basic commodities to ensure an adequate daily caloric intake. This is shows that Lebanese citizens generally did not suffer from food insecurity before the economic depression.

E. Post-Crisis:

1. The State of Food Security in Lebanon

Lebanon has an estimated population of 4.8 million, including Lebanese, Palestinians, Syrians (excluding only Syrian refugees living in Informal Tented Settlements (ITS)), and other nationalities (ILO, 2020). In August 2021, the UN calculated the current poverty rate at 78% among Lebanese (OCHA, 2021), with extreme poverty increasing in 2020 from 8% to 23% and to 36% in 2021 (ESCWA, 2020). Overall, in March 2021, around 3 million Lebanese lived below the lower poverty line (OCHA, 2021). A decrease in the middle class by 30% resulted in new families falling into poverty, which means that more and more citizens find themselves in a situation of vulnerability and risk. Significant levels of unemployment have been reported, with one in five workers losing their job since 2019 (World Bank, 2021). Among refugee populations, these statistics are staggering, with unemployment at 39% among Syrians (WFP, UNHCR, and UNICEF 2021). Among Palestinians, a May 2020 survey revealed that almost 80% of surveyed participants had lost jobs or received reduced salaries since the beginning of the economic crisis and the outbreak of COVID-19 (WFP, 2021). Consequently, existing coping strategies have been exacerbated, particularly in response to people's inability to afford essential goods and services and the drastic increase in food insecurity.

These combined crises have laid bare the underlying vulnerabilities of Lebanon's food system and exacerbated an otherwise limited problem: household-level access. Panic-buying was an issue at the start of the lockdowns, but as of early 2020, supermarkets had not yet experienced persistent food shortages, meaning that physical access to food was not the

problem. The real problem lies in the inability to afford the products consumers need for sustenance; this means that the Lebanese people cannot economically access food (Arnold & Creidi, 2020).

Food price inflation was surely aggravated by the COVID-19 pandemic, but is essentially due to currency depreciation as a result of the way the Lebanese food system is structured. Around 65-80% of commodities are imported and paid for with foreign currency (UNESCWA, 2016). Traders are buying their USD in the black market at elevated rates, reaching around 26,100 LBP to 1 USD as of December 2021 (Lira Rate, 2021). This cost is then transferred to the commodity price, with food price inflation reaching around 367% year-on-year as of November 2020 making most foodstuffs economically inaccessible (Hamadé, 2020). This problem has been also a reality for most locally produced products. Lebanese farmers and food producers buy raw materials and indispensable agricultural inputs like animal feed, seeds, pesticides, and fertilizers from abroad, as well as production and packaging materials such as glass and plastic jars, wrappers for branding, and other essential materials, meaning they have to be bought in foreign currency as well (Boswall, 2020).

In parallel, the Lebanese economic collapse has slashed the incomes of many households due to the hyperinflation and the devaluation of the LBP. In addition to that, COVID-19 lockdowns have either lessened or completely stopped the working hours of some households depriving them from an income at the end of the month (Cheeseman, 2020).

In response to the challenging food security situation, some Lebanese households have gotten creative in creating livelihoods to sustain their families or have switched to

planting or cultivating their food themselves, bypassing the importation system and saving on some costs of food.

2. UA's Contribution to Food Security in Lebanon:

After the popular revolution began in October 2019, an increased number of people were interested in agriculture as they felt these practices would provide them with a form of food security as the supermarket prices started soaring. This interest was demonstrated individually and at the community level, mainly due to Lebanon's economic crisis. Later on, the COVID-19 pandemic happened and worsened the general situation, but it also gave some people enough time confined within their households to commit to urban gardening (Rahhal, 2020b).

In response to this growing interest, plenty of initiatives were launched to guide and help whoever wishes to participate. For example, Kon is an urban gardening initiative in the Furn el-Chebbak neighborhood created in the beginning of 2020 by Souad Abdallah after the popular revolution in 2019. This initiative's main goal is to provide technical support to the people who want to become food independent (Rahhal, 2020c). "It all started during the revolution. I felt the need to do something constructive. I wanted to work with the community and invest in something sustainable. We follow permaculture philosophy and take into consideration the surroundings. We use compost soil and grow what can be grown in the city," said Souad Abdallah in an interview with *The Guardian* (Gustafsson, 2020).

In mid-January 2020 a group of agricultural engineers launched a Facebook page called “Izraa”, meaning “to plant” in Arabic, to provide professional answers to any agriculture-related question, whether urban or rural, high or low tech, and for members to share knowhow through video tutorials (Rahhal, 2020c). Most members have no previous experience in agriculture but expressed a new-found passion for tending to their gardens and plots after their first try during the COVID-19 lockdown. Salim Zwein, one of Izraa’s founders, noticed an increase in high-quality rooftop garden installations and in raised beds. He also observed the return of the youth to the rural areas and planting in the abandoned land of their ancestors (Rahhal, 2020c). The group currently counts 136,000 members with an average of 15 posts daily [2].

Apart from personal initiatives, professionals saw an increased interest in agriculture from the private sector. Dr. Shady Hamadeh, Director of the ESDU at the AUB, took this opportunity to connect these big investors and land owners with smaller farmers and rural women through Ardi Ardak. This initiative was launched by the ESDU with the collaboration of the Lebanese League for Women in Business (LLWB), the Food Heritage Foundation (FHF) and Ziko House spreading knowledge, resources, and access to marketing platforms to small scale producers (Rahhal, 2020c). It also aims at connecting producers with consumers looking for local healthy produce, consequently endorsing sustainable and ecological agriculture and innovative food processing with tradition at the core (American University of Beirut, 2020).

[2] This figure was checked on 11th of May, 2022 on the Facebook website.

However, to address this UA phenomenon, Dr. Rami Zurayk, professor of ecosystem management at the AUB, stresses the importance of these UA practices on the people's wellbeing saying that developing a relationship with soil and nature is liberating during such difficult times. But he clearly states that small individual or even locally organized initiatives will not do much in solving food security issues. "Someone planting pots with herbs is not going to make any difference in nutrition. We need to change the nature of the system, to treat food as a human right, not a commodity" (Gustafsson, 2020).

F. The Contribution of AUB to Its Community:

Today, "The AUB is an institution of higher learning founded to provide excellence in education, to participate in the advancement of knowledge through research, and to serve the peoples of the Middle East and beyond" (AUB, 2011). The NI, CCECS, AREC, the ESDU, and AUBotanic are centers and programs within the AUB prioritizing community engagement and spreading knowledge (Sinno, 2020). Due to its prime location, the university aims to be an exemplary neighbor by using its academic and intellectual resources to address local problems, and spearhead support of ecological designs and environmental sustainability (Myntii, 2013). AUB's involvement in community support has started with humanitarian projects for the disadvantaged, then it moved on to contribution to national development and innovation through research, then enhanced academic programs to meet community engagement outcomes (Myntti et al., 2012).

- The NI

The NI's goals are to assure staff, faculty, and students of AUB's commitment to the neighborhood through a targeted outreach programs and activities. It also provides the knowledge for faculty and students to research problems the neighborhood faces with the aim of creating positive and sustainable change through focused projects that would have many positive secondary effects. The scope of work of the NI is participatory, and involves the community in decision making. Action plans are set up to solve issues raised by the community around AUB after extensive interviews. (Sinno, 2020).

- CCECS

The CCECS was launched in March 2008 aiming to promote civic leadership at the AUB. It ensures that faculty and students of all department are researching and responding to critical social and civic issues affecting the people of Lebanon and the MENA region. In addition to that, the CCECS has a strong student volunteer outreach programs either short- or long-term community-based projects (AUB, 2021b).

- AREC:

The AREC is AUB's campus in the Bekaa Valley, Lebanon's agricultural heartland. Its goals are to promote experiential learning, contextual research, and enhance community outreach. Agriculture and landscape design students spend a couple of semesters during their coursework to turn theory into practice through hands-on learning experiences. The journey at AREC encompasses a community service part that exposes students to the surrounding

rural communities of the Bekaa Valley to contextualize all their knowledge and for AUB to root its commitment to improve the lives of the people of Lebanon and the region. AUB has always taken interest in the concerns of the surrounding rural communities; it has recently established initiatives that support organic and community agriculture, highlighting the need for enhanced rural livelihoods and the importance of sustainability and equity in rural development at AREC. The campus also has mobile medical 'clinics', extension programs, education classes offered to locals, and outreach to farmers' and women's cooperatives (Sinno, 2020).

- ESDU

"ESDU is an inter-disciplinary research and development center, established in 2001, specialized in community development and sustainable agriculture hosted at the FAFS at AUB" (ESDU, 2021). Dr. Shady Hamadeh, Director of ESDU, explains "Our philosophy is to link and to embed research into development. The processes of research and development should be intertwined. And it's possible to conduct development projects with limited resources." ESDU employs a participatory approach to development ensuring that research stems from and feeds into the needs of the local community (ESDU, 2021).

The ESDU has popularized the concept of UA in Lebanon and is now the reference for UA research in the MENA, and is considered as a knowledge hub for urban agriculture. The ESDU was chosen by RUAF to mainstream Urban Agriculture in the MENA region, specifically in Amman, Jordan and in Sanaa, Yemen. Other prominent projects led by the ESDU are:

a. CLIMAT Project and REEF Initiative aims at improving the skills, capacity building, and livelihoods of the vulnerable Lebanese and Syrian refugees in Northeast Baalbeck and West Bekaa. In addition to, developing national strategies for mapping and networking different joint projects of the same objectives.

b. KariaNet (Knowledge Access for Rural Inter-Connected Areas Network) is a regional networking platform for knowledge sharing and management, information and experience in agriculture and rural development in around 10 countries of the MENA region.

c. Reducing Vulnerability of Syrian Refugees and Lebanese in Lebanon: a project supporting the development of home activities or Small and Medium Enterprises (SME) related to agriculture production and food processing.

d. Ardi Ardak: This initiative was launched by the ESDU with the collaboration of the LLWB, the FHF and Ziko House spreading knowledge, resources, and access to marketing platforms to small scale producers. It also aims at connecting producers with consumers looking for local healthy produce, consequently endorsing sustainable and ecological agriculture and innovative food processing with tradition at the core (AUB, 2020).

- The Eco Unit:

The FAFS Eco Unit is an 1,800 m^2 plot of land with open spaces and greenhouses for the propagation and production of native and ecologically adapted landscape plants. This

space is used for teaching, research, experiential learning, and outreach activities. It currently includes a glasshouse with eight growing compartments, open land for projects and research experiments, a plant propagation greenhouse, a vermicompost experimental setup. Landscape Design and Ecosystem Management (LDEM) students use the area to produce a variety of plants for several activities, they may be used for various student projects and for the annual student-organized plant sale that allows the campus community to engage with the general public. Plants produced are used for child education programs in collaboration with other institutions wanting to expose students to the outdoors, connect with nature, and learn about edible gardens, plant biology, composting, and vermiculture. The Eco Unit addresses UA as a tool to support vulnerable communities, build capacities on UA and local food production (Abunnasr, 2017).

- AUBotanic:

The AUBotanic is an initiative that classifies the AUB campus as a botanical garden since 2016. The campus encompasses a unique natural environment with its various flora and fauna out of which some are edible. This is to reiterated the AUB's commitment to remain a protector of its natural environment in the much-urbanized Beirut city. The AUBotanic initiative is spearheaded by a team of experts in the field, engaging as many students as possible to raise awareness about the plants around campus and their importance (AUB, 2021a).

G. Engagement in UA around the World:

1. Global North – University Campus Engagement

Campuses around the world have created and implemented UA programs on their premises to pave the way for more sustainable food and agricultural systems. In countries where there are no imminent crises, innovation is at the center of these community-university partnerships (Niewolny et al., 2012). This community-university partnership paradigm aims for civic revival and a consequent food system transformation (Hinrichs, 2007). A civically engaged agriculture initiative blazes the trail for the creation of a democratic environment, increases social wellness levels amongst inhabitants of the area as well as the students, and it also increases capacity building and community engagement (Tolbert et al., 2009). These transversal initiatives are unique due to their commitment to serving the needs of agriculture students and the community actors involved (Niewolny et al., 2012). When students are involved in community engagement programs, they indirectly acquire knowledge on how to restructure food systems by learning the values, expertise, and understandings of food system actors (Colasanti, Wright & Reau, 2009). In the United States, some Land Grant Universities (LGU) have created civic engagement programs in the context of sustainable agriculture curriculum in collaboration with the neighboring community. Michigan State University, Montana State University, North Carolina State University, University of Kentucky, and Virginia Tech make up the consortia of LGUs set to incorporate civic agriculture programs. Other renowned universities in North America have also promoted civic engagement agricultural projects aiming at engaging students and staff in the creation of urban campus gardens providing food and employment for the communities' most vulnerable. The USA's Harvard, University of Colombia, University of California Berkeley, and Cornell University

and the Universities of Ottawa, Calgary, and Toronto in Canada have campus community gardens in place aiming at putting in place small-scale food systems that tackle student and staff food insecurity, creating space for experiential education, disseminating knowledge about food and food systems, and creating opportunities to work with land and food (Berkeley Food Institute, 2021).

University-led UA initiatives may target other objectives, particularly in regions affected by instability and crisis. In times of crisis, urban gardens play an important role in establishing resilience and guaranteeing an efficient recovery (Shimpo, Wesener & McWilliam, 2019). Community gardens have proved to be of great support to communities recovering from extreme environmental events such as floods and storms. As per Sims-Muhammad (2012), community gardens had a demonstrated role in ensuring food security before and after hurricanes in Southern Louisiana and were regarded as safe spaces and "multi-purpose community refuges" during and after Hurricane Sandy in New York City (Chan et al., 2015). It has been shown that community gardens may boost "psychosocial resilience after a disaster" by indirectly offering post-trauma therapy for users that help "alleviate negative emotions and engage in experiences that enhance positive emotions" (Okvat & Zautra, 2014). Community gardens also promote social interaction and cohesion, they help create and build rapports and strengthen networks amongst people and ensure a positive atmosphere for further collaboration (Firth et al., 2011). These aspects are essential factors for social capital reconstruction and community resilience following a disaster (Aldrich, 2012). The UN defined disaster resilience as "the degree to which the social system is capable of organizing itself to increase its capacity for learning from past disasters for

better future protection and to improve risk reduction measures" (UN/ISDR, 2004). Community gardens contribute to preparing inhabitants for crises by increasing "the resilience of urban social–ecological systems" (Barthel & Isendahl, 2013). The benefits of community gardens listed above extend not only to post-environmental disasters, but also to economic, humanitarian, and political emergencies where people are heavily socially and financially affected.

2. Global South:

a. Cuba:

Almost 25 years into the Cold War, the Soviet Union rose as the leading political influence in Cuba, consequently linking its economy to the Cuban economy announcing barter deals between Cuban sugar and Soviet fuel (Tsokhas, 1980). During that time, the Cuban economy was mainly agriculture-reliant, especially on sugar cane plantations that filled all the six Cuban provinces dominating most agriculture areas (Peters, 2003). This was particularly safe for the alienated USSR ally, as they had a guaranteed market where they could trade their produce. This monocropping approach was economically dangerous for agricultural and political reasons. Monocropping could damage the soil and foster diseases with devastative results if a crop is hit by a certain bug. Politically, monocropping increases dependency on other countries' crop trades to achieve the people's full caloric needs and a necessary diet diversity to receive all the vitamins and nutrients needed for normal growth and development.

In 1991, the Soviet Union collapsed announcing the end of the Cold War along with reverberating effects on the satellite countries and on the rest of the world. A communist country like Cuba, found itself unsupported overnight, and is left without essential Russian fuel, and without an outlet for its acres of sugar cane plantations. The lack of fuel heavily slowed down supply chain activities, as well as complicating high input farming activities due to a lack in fertilizers and pesticides (Rapid Transition Alliance, 2019). In addition to losing its strongest ally, Cuba was also hit by an economic embargo by the United States of America (USA) which complicated the country's search for an alternative fuel source. This impeded food imports and agriculture, consequently slashing the average Cuban's caloric intake from 2,600 per day in the late 1980s to around 1,000 to 1,500 per day in 1993 (EcoWatch, 2019).

With the onset of this sudden food security crisis, Cubans needed to find ways to secure food away from fossil fuel dependency, so they started to plant anything edible on unoccupied land slots throughout the city. In response to this growing trend, local cooperatives have been created for people who wish to trade, buy, or sell local produce or to offer or rent vacant lands for planting (Spencer, 2016).

Four years after the fall of the USSR, Cubans created around 25,000 allotments all over Havana mostly planted and maintained by local families and groups who were responsible for producing most of the fruits and vegetables locally consumed which significantly improved and people's daily caloric intake. This grassroots movement, dubbed "organoponics", was then picked up by the Cuban government as a constitutional way to deal

with food insecurity and ensure people have enough healthy and nutritious food (Clouse, 2014).

As of 2008, 3.4% of Cuba's land was transformed into urban gardens, these also covered 8% of the capital Havana, and later on caloric intake was restored to 2,600 calories a day as it was 17 years ago, prior to the crisis. Due to the inability to purchase and import fertilizers and pesticides, semi-organic agriculture was adapted, even if by default (Rosset et al., 1994). Cubans have saved up to US$39.5 million on the cost of fuel by using organic fertilizers that add up to only US$0.55 per ton, and have also saved around US$2.8 million on the cost of pesticides by switching to biological control agents and biopesticides (Rapid Transition Alliance, 2019).

Positive health impacts have been observed within the Cuban society due to the lack of fuel and other related products, as well as the lack of imports. Adults became more physically active because they were forced to replace card and other fuel-dependent transportation methods by either walking or cycling. They have also changed the food supply chain by replacing most supermarket trips by gardening, planting, and harvesting their own semi-organic ingredients. Consequently, adult physical activity increased 200%, and obesity decreased by 50% (McNamara, 2017)[3].

[3] The aforementioned impacts were reported at an aggregated level and in an uncontrolled environment. They cannot be extrapolated on a national level. Health impacts can also be attributed to the significant changes happening within the Cuban society such as the inability to afford fuel, thus transportation.

b. Palestine:

Another example of a crisis-stricken country closer to the Lebanese landscape is Palestine. The Israeli-Palestinian conflict started in 1948 creating layers of diplomatic, political, and economic complexities in the region with reverberating effects on local populations in every aspect of their daily lives. With the Arab-Israeli war involving Jordan, Iraq, Syria, Egypt and Lebanon ending in 1949 with a victorious Israel, the parts of Palestine that remained, the Gaza Strip and the West Bank, were controlled by Egypt and Jordan respectively. In 1964 the Palestine Liberation Organization (PLO) to fight Israeli forces and recuperate Palestinian lands, but these movements faced strong resistance, causing extreme diplomatic tensions amongst the regional actors, culminating in the Six-Day War. This resulted in Israel taking control of the Gaza Strip, the West Bank, the Sinai Peninsula, and the Golan Heights. The following decades are characterized by consistent ebb and flow, resistance from both parties, even when there is a palpable power imbalance that skews in the favor of Israel (History.com, 2018).

As a result of these conflicts, the Palestinian people were confined to specific parts of their former country, mainly the West Bank and the Gaza Strip, with a buffer zone between Israeli mainland and Palestinian fragments to lessen the frequency and weight of the tensions. These limiting measures, and imposed movement restrictions have also extended to several other areas threatening the food security of Palestinians, as well as disrupting commerce, livelihoods, commerce, and the labor market in general (History.com, 2018). Palestinians have restricted access to fertile land that has been annexed to the buffer zone, which contains

29% of Gaza's arable land, and with a total of 46% of agricultural land inaccessible due to its destruction by the "Operation Cast Lead" (OCHA, 2010). They also have a restricted access to fishing areas that were reduced from 12 to only 3 nautical miles, which caused increased pollution, consequently decreasing the quality and quantity of catch (United Nations, 2009). The ILO has stated that Israeli activity isolates the West Bank from East Jerusalem and hinders economic growth in the area (United Nations, 2009).

Palestinian farmers face several obstacles related to production, but they also have difficulty selling and exporting their produce to generate income and revive the economy. Movement restrictions as well as checkpoint delays increases the price of Palestinian produce preventing the competitive edge to ensure a higher market share (Collard, 2013).

These instabilities have created a dual yet antagonistic response from West Bank and Gaza's inhabitants. In response to these harsh living conditions, Palestinians have witnessed heavy aid influx, which is often targeting the consequence of the problem, instead of tackling the problem at its core. This consequently created aid-dependency which engenders a whirlwind of problems that can be irreversible on the long run. Handouts, food vouchers, and cash aid have stunted the development of the area's factories, farms, and businesses. What should have essentially been an emergency response to the displacement, has become the norm (Collard, 2013).

On the other hand, another form of assistance has emerged to ensure sustainable food security for the people who need it the most. What started as individual urban and peri-urban crop production on an individual and family level, has become an urban movement receiving support from different donors and NGOs. Most farms in Gaza and the West Bank are small;

50% of farmers in the West Bank have less than 2.5 acres to plant, whereas 90% of farmers in Gaza plant on lands less than 0.5 acres (ANERA, n.d.). Considering the size of these farms, the fact that farming is an ancestral practice passed down generations, and that food insecurity is a main concern for people living in Gaza and the West Bank, many people have resorted to planting their own food for personal consumption as well as trade and barter with neighbors, family, and friends. In response to this phenomenon, many farming cooperatives have been created to sustain farmers and reinforce the agricultural sector by connecting farmers to others, sharing know-how and even materials and to create more market opportunities. Boosting the agricultural sector, even by planting small plots, has created livelihood opportunities, increased the daily caloric intake, and enhanced the quality of life for many Palestinians. Currently, 90% of agriculture land in Gaza is considered urban or peri-urban (ANERA, n.d.).

However, there are several obstacles that limit sustainability and resilience of urban agriculture in Gaza and the West Bank. Unlike the Cuban example, the government did not take in charge the management and coordination of the several farming cooperatives, which decreases their efficiency due to the fact that their work is neither united nor complementary. Other factors such as decreasing land availability due to the need to convert arable land to housing plots, and the unavailability of water for irrigation are significant limitations to the evolution of urban and peri-urban agriculture to a point where it is considered as sustainable (Collard, 2013).

c. Jordan:

In 2009, the Greater Amman Municipality established a specialized office for urban agriculture and has allocated human and financial capital in the institutionalization of these urban farms and to provide assistance to farmers. This was due to an increased interest in rooftop gardening by disadvantaged Jordanians and Palestinian refugees living in camps to increase their access to food away from markets with price inflations following the 2007-2008 food crisis. A pilot project was implemented to support rooftop gardens particularly in disadvantaged neighborhoods. Then the municipality set up a land bank for urban agriculture after an extensive mapping exercise to find vacant plots available in the city for planting (GUPAP, 2019).

Jordanian women were also targeted by a pilot project supporting a local cooperative in improving the production, processing, and marketing of some crops like green leafy vegetables. Agricultural loans were made more accessible for urban farmers as lending institutions have officially recognized urban farmers as eligible to receive small loans for support and investment. In addition to the support provided by local institutions, support has also been granted on a national level. The Ministry of Agriculture's Agricultural Extension Department provide trainings, workshops, access to knowledge and even in-kind support to urban and peri-urban farmers. They have also promoted grey water recycling and rainwater collection for irrigation purposes (GUPAP, 2019).

An exploratory study of urban agriculture in Amman was done by the ESDU to examine the potential benefits of rooftop agriculture in the city. The study entailed a rooftop greenhouse, sized four to six meters square, to plant vegetables for household consumption or to trade for other commodities, six bee hives sized 6 m^3, and a chicken coop sized 4 m^3.

Grey water was used for the purpose of irrigation, and composting was implemented as a way to prevent waste and have organic fertilizers for the rooftop plantations. The families were able to eat the produce that covered around 10% of their yearly fresh vegetables' intake, they also shared the extra produce with friends and family, this created around JOD250 (USD 352) of savings per year. The honey harvested from the bee hives amounted to an average of 50 kg per year with an evolution from 30 kg in 2013 to 60 kg in 2016. The family was able to sell most of the produce for an average of JOD12.5 (USD 18) per kilo, which amounts to around USD 1,100 revenue per year just from honey. The chicken coop production has been halted, although the families who participated in the study are interested in reviving it. Grey water filtering technology has also been installed on the roof to provide the small urban garden with irrigation water whenever needed and to reduce waste at the same time. The results of this study were promising: UA was found to facilitate labor market inclusion for the people practicing it, increase their income, and provide them with fresh food for consumption (Omari & Tohme Tawk, 2016).

H. The ESDU's contribution to UA in MENA:

The ESDU's numerous projects are spread around the MENA region with a common goal: sustainability. As part of a global partnership on Urban Agriculture and Food Systems, the RUAF established a consortium of experts like regional and governmental bodies, research centers, and NGOs with a proven track record in urban and peri-urban agriculture and urban food system programming. The goal of this partnership is to facilitate access to knowledge for the development of science, policy and practice (RUAF, 2019).

The ESDU was chosen as a regional partner with RUAF to promote a multi-

stakeholder action planning and policy formulation (MPAP) on urban agriculture and food security in Amman and Sanaa by promoting a multi-stakeholder approach including the national and local authorities, citizens, farmers, civic organizations, and the private sector to prepare, implement, and evaluate policies and action plans (GUPAP, 2019).

The MPAP was initiated in 2007 with the Greater Amman Municipality. This collaborative process aims to promote communication and dialogue amongst the main stakeholders to promote codetermination of problems and ensure a joint decision-making process to facilitate policy creation and implementation of consequent projects. A City Strategic Agenda (CSA) on urban agriculture was then developed as a result of the MPAP. The main challenges to urban agriculture were identified: water scarcity, urban land use for housing and infrastructure, land price increase, land ownership fragmentation, legislation prohibiting farmers from raising livestock in the Amman area. The outcomes of the MPAP process were positive as an increase in awareness was noticed amongst all the stakeholders. As a result of these discussions, the Greater Amman municipality adopted the concept and have hosted several workshops and awareness sessions about urban agriculture to all relevant stakeholders including local authorities from various cities around Jordan. They have also supported environmentally sustainable agricultural projects in the city, such as rainwater collection for irrigation, or installing grey water filtering systems, or even organizing large-scale tree plantations around the city (GUPAP, 2019).

The ESDU has similarly provided support for the Yemen Association Sustainable Agriculture Development (YASAD) in Sanaa. They have jointly developed, with the Municipality of Sanaa, a participatory plan aiming to re-formulate the laws and regulations to sustain agricultural activities and ensure a safe access to land, especially land for grazing

(Dubelling & RUAF, 2011).

Thanks to the foundation laid down by the aforementioned initiatives, the RUAF published a technical report highlighting the results of the From Seed to Table Program (FStT), including the positive effects on the cities of Amman, Jordan and Sanaa, Yemen, where the ESDU was the main regional partner. Nine objectives were initially set to determine the success of this program and were consequently measured to determine the success of this program in each of the implemented area (Dubelling & RUAF, 2011).

- Objective 1: Enhance the capacity of local resource centers and partners.
- Objective 2: Enhance the capacity of the local stakeholders by organizing capacity building and training for local staff to better support farmers and local businesses in general governance and financial management. A successful example was observed in Amman where only two of the projected four green onion cropping cycles were supported by the FStT, the remaining two were auto-financed by applying the FStT principles taught throughout the program.
- Objective 3: Enhance income and food security of farming households. In Amman and Sanaa, disposable income of the FStT beneficiaries has increased between 5 and 20%, this extra money can be used for investment and expansion and consequent increase in income. The household beneficiaries have also noted a 15 to 25% increase in production. 75 to 100% of beneficiaries have also recorded an enhanced access to production and marketing infrastructures.
- Objective 4: Enhance the access of urban producers to credit and financing. As part of the FStT, an investigation was done to study and map out the demand and

opportunities for different financing mechanisms for supporting urban agriculture activities by small scale farmers. This study was able to create links with financing institutions and create lobbying schemes for certain credit and banking establishments in the city. In Amman, farmers were able to negotiate better loan conditions for small urban farmers.

- Objective 5: Strengthen producer organizations. In order to achieve that, an organizational analysis of each of the producers' organizations were carried out, and plans to strengthen the organizations were created and implemented accordingly. Producers in Amman and Sanaa have set up saving schemes that vary according to each producer. The savings are either individual contributions spared by each individual, or can be a percentage of the gross income of the enterprise that is earmarked for saving.
- Objective 6: Enhance learning from monitoring where an operational framework and output monitoring tools have been created and used in all the regions where FStT was implemented. A lessons learnt workshop was also organized to optimize the results of the program and can be accessed and used by all the participating cities.
- Objective 7: Enhance access to information on urban agriculture. The implementing partners, including the ESDU, have produced numerous informative outputs on urban agriculture for different stakeholders and audiences participating in urban agriculture one way or another. The main audience include local and national governmental bodies such as municipalities or senior and field

level staff of governmental organizations and ministries, local and international NGOs working in the area, urban farmers and producers, researchers and students, and other interested parties.

- Objective 8: Enhance the capacity of local stakeholders through distance and university education. This is particularly significant for the ESDU as it is hosted by the Faculty of Agricultural and Food Sciences at AUB. The ESDU has increasingly introduced urban and sustainable agriculture knowledge and materials into the courses it is responsible of at AUB and at the Lebanese University. These universities host hundreds of multicultural students from different backgrounds and countries, especially from the MENA region.
- Objective 9: Merge multi-stakeholder forums (MSF) and national policy frameworks to include urban agriculture into city planning, land usage repartition, and development plans. This has been observed in Amman particularly where the government and the local Grand Amman Municipality have mainstreamed rooftop gardening and urban agriculture in their updated master plan. The government has also developed an urban agriculture land bank in Amman to counter land fragmentation due to inheritance and to match unused areas in the city with farmers willing to invest (Dubelling and RUAF, 2011).

CHAPTER V

DISCUSSION AND RECOMMENDATIONS

A. Discussion

The purpose of this study is to build on past UA models that have proven successful during crises and draw from the lessons learnt of the models that have failed; extract the pros and cons of implementing this model in the Lebanese context within the premises and under the managerial umbrella of the AUB; and propose an adapted model to the current crisis situation happening in Lebanon. For this study, the indicators for a successful UA intervention in times of crisis are based on Cuba's UA experience, as Cuba's experience is widely considered a successful model as per the literature (Koont, 2008).

According to the literature review, the Cuban post-cold war model can be considered the most successful model for crisis response through UA due to several reasons. The Cubans initially implemented this mode of production out of necessity. Since then, the model has thrived, and has helped Cuba, within limits, achieve self-sufficiency and food sovereignty to preserve national security, ensure Cubans receive their needed caloric intake through natural and healthy food, and preserve the environment by employing sustainable agricultural practices. The success of the Cuban model is due to different reasons characteristic to the Cuban landscape, which complicate the replicability of this model anywhere else in the world (Koont, 2008).

The peculiarities of the Cuban model stem from the fact that they had to suffer through a USA embargo, and the food crisis was acute and extreme. However, the positive

catalysts are the fact that urban lands had lost their value, so land was cheap and easy to find and acquire for planting. Even small plots were used for planting because land had little alternative value if basic nutrition was lacking. The most critical characteristic, which was lacking in most other models under study, was the fact that the government's position was united, strong, and decisive when it came to UA policy; the government offered its complete support. The exceptional power of the Cuban government is entirely responsible for the success of the UA program. Government land was donated and freely given to the people to practice urban agriculture. A special legal framework was put in place to allow interested people to lease government land for 25 years with renewable contracts (Schultz, 2012). The government also distributed seeds for free to plant in the "organoponicos", thus decreasing the initial starting cost. The land use policies were very well adapted to the context, as land was treated as the breadbasket of Cuban families and not as an asset that can be traded for monetary gain. Cubans owned their homes but they were not allowed to sell them in the years between 1960 and 2012. Real estate had no value on its own, its value was directly linked to the ability to produce food and nutrients to counter the food and economic crisis that happened post-cold war (Clouse, 2014). The communist model characteristic of Cuba where land access and control were severely restricted is very different from the Lebanese context. The governmental grasp makes this model difficult to replicate anywhere else, as it is essentially dependent on a proactive governmental response as well as an exceptional unity amongst the people for one common goal, survival.

In Lebanon, swift governmental action is often lacking when it is most needed, especially in response to actions that are unusual, or different than the traditional aid or

assistance paradigm Lebanese people are used to. In the Cuban model, Cubans had to work their land themselves in order to harvest their crops and be able to eat. A swift, flexible, and organized response is essential to replicate the Cuban response, which is not guaranteed in the volatile context in Lebanon.

Currently, the Lebanese governmental response to the compounded crises has not been ideal. Limited policies have been drafted or enforced to counter the problems and ameliorate the standard of living of the Lebanese people (Bahn, Yehya and Zurayk, 2021). Although general food insecurity is not as imminent in Lebanon as it was in Cuba after the dissolution of the USSR, the negative impacts of the crises have not been felt equally by all Lebanese people. The distribution of wealth in the country has long been unequal, and the rift between the upper and lower classes has never been this deep (Hayek and Mardam Bey, 2020). The US embargo imposed on Cuba back then lead to a sharp increase the price of the available commodities and causes many other essential commodities to go missing. This is very similar to the Lebanese situation, where the price of imported goods has skyrocketed due to the LBP devaluation, drastically affecting the purchasing power of the Lebanese people.

Crisis times ultimately lead populations to employ certain coping strategies and behave in unusual ways to make ends meet. The coping strategies used to counter the effects of these compounded crises have been different among different classes. As previously mentioned in the literature review, Lebanese people have resorted to coping strategies including urban gardening, planting in pots or small plots of land around the house or around their mountain houses. However, not all of these households have been planting and

harvesting for sustenance, some have been practicing UA to maintain their mental health or their physical health by ensuring daily movement and exposure to fresh air (Rahhal, 2020b). The sought after effects and final goals of practicing UA is dependent on the socio-economic status and on the class of the people who practice it. Due to the increasing and flagrant difference between the socio-economic classes in Lebanon, it will be difficult to expect a high level of commitment to UA and tending the land as meticulously as Cubans did during the crisis.

The Cuban government was ultimately backed up and supported by a plethora of cooperatives, local associations, and even individual initiatives to achieve the common goal of curbing food insecurity. In Lebanon, many cooperatives, local associations, and individual initiatives have also burgeoned in response to the crises, as mentioned previously in the literature review, however, these initiatives were not created to support the government, on the contrary, they were here to fill a gap. This gap was due to the inefficiency and inactivity of the Lebanese government to organize and promote a comprehensive, state-wide UA program as part of a crisis mitigation strategy.

Hoza Ngoga and Delbridge (2020) stress that legitimacy is an essential part of a successful UA program. The lack of proper UA policy implementation in Lebanon is likely to impede progress and the upgrading of these local initiatives to a national scale. The inequality and increased difference amongst socio-economic classes in Lebanon are an obstacle to the equal motivation and interest in participating in UA initiatives and in a fair allocation of resources amongst people.

Part of the gaps identified due to the lack of government action have been filled by AUB institutions and programs, particularly by the ESDU. The Ardi Ardak initiative connects people with available lands to plant and harvest, this is reminiscent of the government policy implemented by the Cuban government during the crisis. The ESDU was also a key player in the "Zari'et Albi" campaign that incited people to start practicing UA in 2020. The legitimacy needed for proper program implementation can be found at AUB institutions due to the university's longstanding positioning in Lebanon and in the region as a pioneer in research and knowledge dissemination. The governmental gaps can be filled by the AUB through proper capacity building to the neighboring inhabitants, through well targeted communication channels to disseminate knowledge to as many Lebanese people, and by promoting campus community engagement strategies and incorporating UA as a key part of these strategies.

B. Recommendations

The final goal of this research exercise is to recommend a model for AUB to implement campus community gardens, amongst other strategies to enhance community food security during crises times. Below are six recommendations to take into account based on the research and analysis done throughout this paper:

1. Map out the total area of cultivable land on the premises of the AUB campuses in Beirut and in the Bekaa AREC campus, and create a directory of local and heirloom cultivars that can thrive in each area with recommendations accessible to all those who are interested. This recommendation is based on the Jordanian government's

effort to increase the availability of urban lands for those interested in planting by mapping out the urban lands available and facilitating access of this information on the municipality level;

2. Enforce and promote the Ardi Ardak initiative in broadening its scope by linking AUB lands with people interested in practicing UA to increase their resilience;
3. Integrate UA introductory courses in most curricula like Freshmen, the Continuing Education Center, and for all FAFS students and in collaboration with local UA farmers. The courses could be multifaceted, with a theoretical part taught by pioneers of UA and current faculty, and practical sessions could be given at the AUB Eco Unit for further demonstration and to promote a hands-on teaching model that could spark a deepened interest and enhance knowledge by repetition. This is based on the success observed within global north universities in integrating urban agriculture within curricula and advance food system sustainability on a smaller scale. Although the aims are different, the results of integrating UA knowledge on a transversal level in campuses would achieve a unified level of knowledge that can be either transmitted or put to practice;
4. Provide capacity building for FAFS employees and students to allow them to properly coach and train whoever is interested in undertaking UA as a potential coping strategy, or even a long-term livelihood opportunity;
5. Create online platforms; a website or social media page, or an on-campus weekly market or a permanent stall where people can sell their produce for whoever is interested or even accept barter deals with other people who are willing to trade certain goods for fresh produce harvested in the city. The KariaNet platform or the

ESDU website can both be used as a starting point, and when the program is well established, a special website or page can be created;

6. Liaise with local governmental authorities, starting with the local municipalities where both AUB main campus and AREC are located. This collaboration should seek to create a first prototype for UA in collaboration with the AUB and the neighborhood around AUB's campus, to draft lessons learnt and success stories, and to gradually work the way up to the Ministries of Agriculture, Labor, Economy, or Social Affairs to create and implement an overarching national plan for UA as a crisis response in Lebanon.

CHAPTER VI

CONCLUSION

In conclusion, the potential is great for AUB to become a hub for the promotion of UA as a community engagement strategy to promote food security in times of crisis. Campus lands have a particularly high value for the institution, so they will not be sold or invested by a third-party, so the value of these lands could be associated to the agricultural outputs they might produce as a consequence of UA. AUB's longstanding reputation for fostering development and promoting innovation can be compared to that of some universities in the global north, such as Harvard, UC Berkeley, and some other LGUs in developing and promoting community engagement as a development and sustainability strategy for the neighboring community. The ESDU's thorough knowledge and experience in UA, as well its peculiar experience in the MENA region, particularly through the RUAF project implemented in Jordan and Yemen, lay the groundworks for a proper UA project implementation in Lebanon. The ESDU have deep connections, stellar research and programmatic tracks, and practical knowledge of the Lebanese landscape, particularly in agriculture. Harnessing their knowledge of the Lebanese peculiarities and their regional UA expertise would be highly beneficial for targeted and rich programming of UA interventions as a crisis response.

The knowledge the AUB possesses, its deep roots in Lebanon and the region, and the trust it instilled in society and local governmental bodies allows it to be a key driver in social

innovation and the advancement of UA as a mitigation strategy for food insecurity in light of the multitude of crises Lebanese people have endured in the past three years.

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