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THE ROLE OF URBAN AGRICULTURE IN TIMES OF FOOD SECURITY CRISIS

CASE STUDY OF GAZA CITY

RESEARCH REPORT



SUBMITTED BY

Nezar M.H. Nassar

Thesis Submitted to

Van Hall Larenstein University of Applied Sciences

In Partial Fulfilment of The Requirements for the Award of

MSc Management of Development

(Food and Nutrition Security)

SUPERVISED BY

Marcel Put, PhD

September 2019

Cover Photo No (1): Rooftop garden using the hydroponic system at the urban area in Gaza Strip.

Reference:

Aljazeera, 2017. *Alternative farming on the rise in besieged Gaza*. [Online]

Available at: <https://www.aljazeera.com/indepth/features/2017/01/alternative-farming-rise-besieged-gaza-170120074544620.html>

[Accessed 29 May 2019].

ACKNOWLEDGEMENTS

Thank you so much to God for the gift of life, and mercy through my studies in the Netherlands. I am also grateful to my father for their continued support throughout my journey to complete my main studies. Which gives me constant and much-needed strength.

This study could not have been achieved without the assistance and contributions of a number of personalities and organizations. I feel very indebted and grateful to Dr. Marcel Put supervisor for his great supervision, guidance, scientific advice and the constant attention he has shown in my work.

All VHL lecturers are recognized for their professional contributions, commitment and guidance.

Special thanks to all urban farmers in Gaza City for their voluntary participation in filling out the questionnaire.

DEDICATION

I dedicate this thesis to those people who are food insecure all over the world, especially the people of Gaza Strip.

ABSTRACT

Urban Agricultura (UA) is among the socio-economic sectors linked to food security. Therefore, they play an important role in the development process by contributing to improved food security, job creation and income generation. The purpose of this research is to evaluate the UAWC "UA project" on the state of food security and the income situation at the level of HH in Gaza City and to suggest recommendations to UAWC to modify their strategy and projects orientations.

Both quantitative and qualitative methodologies were used in the research, whereby a survey of 40 random UA farmers who benefited from the UA project was prepared. The work was also carried out with 10 other UA farmers through Focus Group Discussion (FGD). In addition, semi-structured interviews were conducted with five key informants to collect other relevant data.

The results of the research revealed that the UA project was not carry out as planned for many reasons. For instance, lack of fund and the instability in the political and security situation due to the daily conflict between the Palestinian and Israeli sides that reflected by high restrictions on importing UA project inputs from abroad.

In addition, 86% of respondents feel food secure in term of availability and 88% of respondents improve their income status due to UA project participation, and most respondents consider UA as a strategic source of fresh food and a about a third of them as a strategic source of income at HH level in Gaza City.

The UA project has a positive effect on sustainable use of natural resources. UA farmers re-use different types of wastes such as food/kitchen waste, UA wastes and treated wastewater as inputs of UA activities. For an instance as fodder for their animals and as organic fertiliser for their crops.

Furthermore, UA has a positive effect on human capitals in term of improving education and health at the HH level. Also, on financial capital in term of saving money for different purposes and on natural capital in term of more sustainable use of NR. In contrast, UA faces many challenges related to access to land, irrigation water and lack of good UA practices, as well as lack of governmental support.

On this basis, it is recommended UAWC to modify their strategic plans, projects and policies for the next 3 years toward development agriculture sector in GS. Through adopting UA as a top intervention and solution priority that will help overcome some of GS challenges.

Furthermore, UAWC recommended to providing UA farmers with technical advice, high-quality extension services and practical training related to using modern agricultural technology and practices such as aquaponics systems, reusing treated wastewater and make of organic fertilisers, post-harvest practices and marketing skills. In addition, raise UA farmers awareness about the requested regular maintenance for aquaponic systems in term of spare parts and the cost in order to keep their projects more sustainable.

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LIST OF ABBREVIATIONS

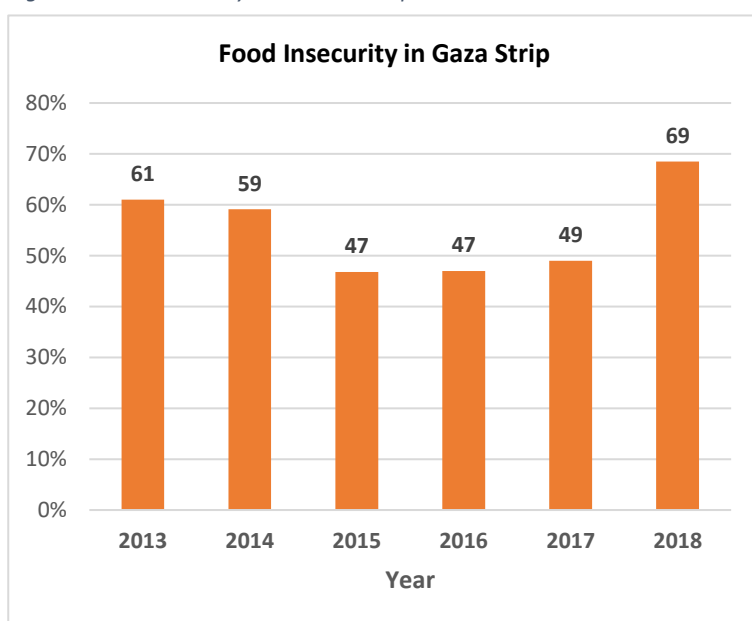
CBOs	Community-Based Organisations
COGAT	Coordinator of Government Activities in the Territories
CMWU	Coastal Municipalities Water Utility
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FSS	Food Security Sector in Palestine
GS	Gaza Strip
HHs	Households
MoA	Ministry of Agriculture
NGOs	Non-Governmental Organizations
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
PCBS	Palestinian Central Bureau of Statistics
PWA	Palestinian Water Authority
RUAF	Resource Centre of Urban Agricultural and Food security
SLF	Sustainable Livelihood Framework
UAWC	Union of Agricultural Work Committees
UN	United Nations
UNDP	United Nations Development Programme
UNODC	United Nations Office on Drugs and Crime
UNSCO	United Nation Special Coordination Office
US	United States
USD	United State Dollar
WFP	World Food Program

CHAPTER 1: INTRODUCTION

1.1 Introduction

The primary aim of this research was to evaluate the significance of the “Urban Agriculture Project”, that was carried out by Union of Agricultural Work Committees (UAWC)¹ on the food security status and the income of the small-scale farmers at the household (HH) level in Gaza city (GS) in order to suggest recommendations. This project was a response to the predicament people were in because of the systematic destruction of Palestinian agricultural sector by Israeli forces

Figure 1: Food Insecurity in the Gaza Strip



The systematic destruction included uprooting of trees, destroying crops and preventing access to agricultural land and equipment. Furthermore, most of the infrastructure that has destroyed major irrigation and electricity systems, agricultural roads, greenhouses and vegetables have covered open fields over the past 10 years. This resulted in 69% of GS HHs were food insecure in 2018 (see figure 1) (SEFSec, 2018) and 53% were living in poverty in 2018 (WFP, 2018).

Source: (SEFSec, 2018)& (OCHA, 2018) Annual Humanitarian Needs Overview Reports

In addition, GS has examined many of the Israeli aggressive measures against land and agriculture; especially after the year 2008. In 2014 only, the direct damage for the agricultural sector in GS counted to more than 250 million USD due to the war conducted by Israeli forces against GS (MoA, 2014).

Small farmers currently do not have the financial capacity to repair and replant their land. Thus, unable to get vegetables and fruit needs. Therefore, they have negative effects on their food security status and income situation.

The project was in response to the needs of small-scale farmers. Because most of them lack their agricultural assets due to successive wars against GS as mentioned above.

The urban agricultural project aims to contribute to improving the food security situation and the income of small-scale farmers at GS. The project improved the sustainability of the intervention by establishing home gardens grown with vegetables, fruits and herbs. In addition, breeding animals such as goats, cheese, rabbits, chickens and birds. Also, create rooftop gardens through the use of a hydroponic system to grow vegetables and fruits, as well as raise birds.

The project helped the target group (small-scale farmers) produce fresh vegetables, fruits, meat and eggs for daily consumption. In addition, they earned more income by selling cash crops, animals and

¹ UAWC is a civil, independent and non-profit organisation, established in the year 1986 following an initiative by a group of agricultural engineers, farmers and volunteers both male and female. Its priorities are essentially focused on social and economic empowerment of the Palestinian farmers to reinforce their steadfastness on their land and to achieve food sovereignty.

eggs in local markets. The new source of income has been invested in various aspects of life, such as savings, education, health, child nutrition and home rehabilitation.

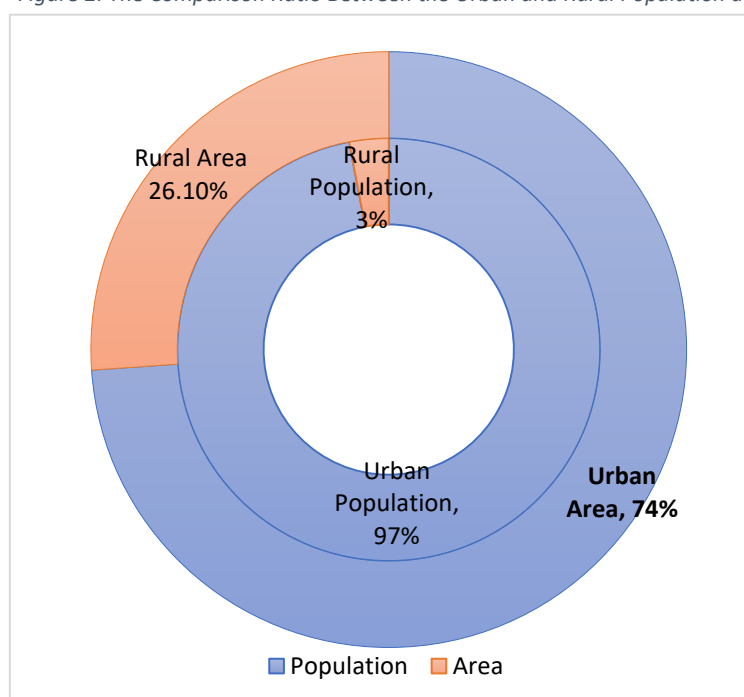
The project began in February 2017 and targeted 100 small-scale farmers. It was implemented in partnership with three Community-Based Organisations (CBOs) and funded by the Food of Agriculture Organization of the United Nations (FAO) for a one-year duration.

The project ended in February 2018. UAWC therefore wanted to know the real effects of the UA project on the target groups.

1.2 Problem Statement and Justification

GS is a small stretch of land bordering the Mediterranean Sea. The population of this area is estimated at about 2 million people (PCBS, 2017) which makes GS be one of the most highly populated areas of the world.

Figure 2: The Comparison Ratio Between the Urban and Rural Population and Areas in Gaza Strip



And as reported by FAO report 2013, 97% of GS population is urban and camp resident (FAO, 2013). Also, about 73.9% of its areas are urban (PCBS, 2016). Thus, do not have access to one of the main natural resources requested for agricultural which is the land. Therefore, there is a critical need to find out alternative and creative approaches to achieve as ideal as a possible investment for urban agricultural in GS (see figure 2).

Source: (FAO, 2013) & (PCBS, 2016)

By using vacant spaces available in urban homes at the cities such as backyards and rooftops to create home gardens for crops raising and livestock breeding. The aim of urban horticulture is to support productive activities that can make essential contributions to enhancing resilience, improving food security in terms of availability, improving income and food consumption through high-quality food for the poor HHs.

As a non-governmental organization UAWC, which operates in the agricultural sector in GS, lacks knowledge of the actual effects of the "Urban Agriculture Project" on food security status and the income situation of the participation small-scale farmers in the GS.

1.3 The Objective of the Study

To evaluate the “Urban Agriculture Project” implemented by UAWC on the food security status, and income situation at HH level in Gaza city, in order to provide UAWC with recommendations that will help them to modify their strategy and projects orientations.

1.4 Research Main Question

What has been the effect of the “Urban Agriculture Project” on the food security status and income situation of small-scale farmers HHs at Gaza city?

1.5 Sub - Research Questions

1. What are the project characteristics on paper and what happened in reality?
2. What was the effect of “Urban Agriculture Project” on food security’s status in term of availability at the small-scale farmers HHs at Gaza city?
3. What was the effect of “Urban Agriculture Project” on the HHs income at the small-scale farmers HHs at Gaza city?
4. What is the effect of “Urban Agriculture Project” on the sustainability of using the natural resources at the small-scale farmers HHs at Gaza city?
5. What has been the effect of “Urban Agriculture Project” on the human capitals, financial capitals, and natural capitals at the small-scale farmers HHs at Gaza city?

CHAPTER 2: LITERATURE REVIEW

This chapter is a literature review related to food security including definitions and evaluation of projects, and most suitable conceptual framework that will link all the concepts together.

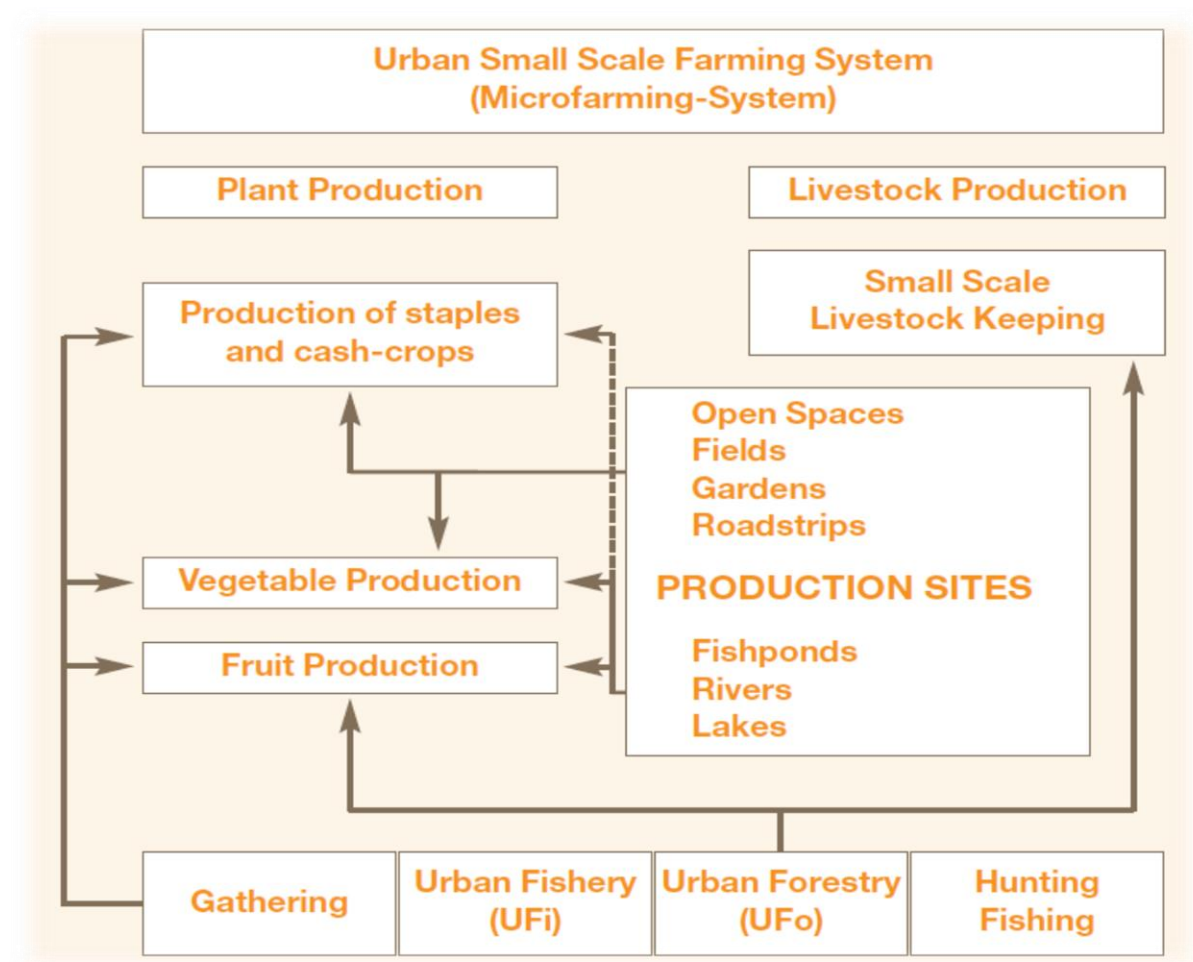
2.1 Definitions of Key Concepts

Urban Agriculture (UA)

There are different definitions about the definition of UA as illustrated below.

(Drescher, et al., 2000) State that UA is a combination of many various activities like gardening, staple food production, hunting, gathering and urban forestry combined with food production, as per the figure below. UA is not only referring to food crops and fruit trees grown in cities but also includes the raising of poultry, rabbits, bees, goats, cheeps, snakes, guinea pigs and other indigenous animals. Urban fish farms are also amongst the food systems in many tropical cities (Drescher, et al., 2000).

Figure 3: Urban Small-Scale Farming System



Source (Drescher, et al., 2000, p. 2)

(Smit, et al., 2001) characterize UA as an industry that produces processes and markets food widely in response to the day by day consumers' demands within a town, city, or metropolis, on many types of privately and publicly held land and water sources found throughout intra-urban and semi-urban areas (Smit, et al., 2001).

(Quon, 1999) has a wider definition would stress those components that have come to portray urban agribusiness as it is performed today while recognizing the great variety within it. five elements are more commonly found in these definitions. These include: 1) the location of the occurrence of UA; 2) the different activities types included within UA; 3) the lawfulness and type of land tenure under which the urban farming activities happen; 4) the different phases of production included in UA; and 5) the size of the activities of urban farming. Two other elements which are important for the groups with lower incomes might be added to the list; namely, the activity's purpose and the groups' types engaged in agricultural production within the urban areas (Quon, 1999).

In this thesis, the definition of UA that will be used is (Quon, 1999) definition. Because it's comprehensive and includes all the UA elements.

Food Security

Food security, at the individual, HH, national, regional and global levels is achieved when all people, at all times, have physical and economic access to sufficient, safe and nutritious food (vegetables, fruits, meats, and cereals) to meet their dietary needs and food preferences for an active and healthy life. The food security has four main dimensions: availability, accessibility, utilization as the pillars capped with stability (World Food Summit, 1996). However, in this thesis, the availability and financial accessibility are focused on.

Food availability: The availability of enough quantities of food of appropriate quality, supplied through domestic production or imports (including food aid) at the HH level (FAO, 2006). However, in this thesis, domestic production is focused on only.

Food accessibility: Access by individuals to adequate resources for acquiring appropriate foods for a nutritious diet (FAO, 2006). In this thesis, the financial accessibility in term of income from the selling of UA products is focused on.

2.2 The Practice of Urban Agriculture

UA is practised on land and water scattered throughout the urban and semi-urban areas. It utilizes intensive production methods, using and reusing the natural resources and the wastes of urban areas to cultivate a diversity of crops and raising livestock. Although UA it is practised differently in different countries, it revolves around four generally defined farming systems: aquaculture, animal husbandry, horticulture and agroforestry, production of staple and cash crops (UNDP, 1996).

During the last few decades, UA has increased greatly and rapidly worldwide. There are currently about 800 million urban citizens around the world engaged in UA (Smit, et al., 2001). In 1996, the UNDP estimated that approximately 33% of urban families were producing about a third of all food consumed in cities during the early 1990s (Smit, et al., 2001). Parts of Africa, Asia and Latin America have experienced a surge in urban agricultural production in recent years. For example, it was estimated that the overall proportion of the African urban population involved in urban cultivation was 10-25% in the early 1980s, whereas this proportion rose substantially during 1990s, reaching 70% in the city of Dar-Es-Salaam (Rakodi, 1997).

Though agriculture has traditionally been considered a rural activity, it is now being carried out by approximately 800 million urban citizens who contribute 15-20% of the world's food production (Armar-Klemesu, et al., 2000). Subsistence and cash crops farming within city limits has recently come to the forefront as a strategy to reduce malnutrition and food insecurity among poor urban HHs in the low-income states in the face of rapid urbanization and population growth.

(UN-HABITAT, 2002) stated that there are approximately 1 billion poor people in the world, 75% of whom are living in temporary urban settlements without adequate shelter or life basic services (UN-HABITAT, 2002). Urban farming is performed by two groups in most developing countries, the conventional farmers, who have been engulfed by urban expansion, and the newcomers' migrants. For example, during the last couple of decades, Kenyan urban centres have witnessed accidental changes of boundaries. The boundary changes have annexed areas that are mostly rural in character with agriculture as the dominant land use. Urban migrants and their families are the second major group of urban farmers. Most urban farmers are poor although they come from all income categories, low, middle and high. In Kenya, most of the urban HHs are unable to feed themselves properly and adequately from their incomes, and those who are able to cultivate land in backyard spaces near their residents, on roadside verges, or on another publicly owned open land. Subsequently, the satisfaction of basic needs of food is the main objective and the essential persuading factor administering their behaviour, rather than profit earning and capital accumulation. The groups with very low-income tend to use public land, unlike the better-off HHs who tend to farm on private and mostly their backyards (Mireri, 2002).

2.3 The Benefits and Challenges of Urban Farming

(Nugent, 1999) stated that, since urban farming is normally taken place within or around the cities, besides its unique features it also has constraints. The UA benefits of cities imply its contributions to the sustainability of cities. Nugent added that it is helpful and important to study UA from its three axes, economic, social, and ecological, to realize its sharp benefit; hence, its sustainable contribution to the city (Nugent, 1999).

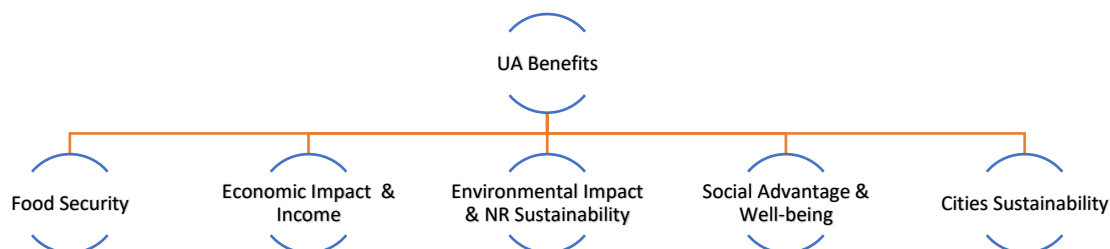
2.3.1 Benefits of Urban Agriculture

UA benefits the economy and health in term of income, well-being, and food security, as well as decrease the vulnerability and increase the resilience, and keep the environment more sustainable. While, for those people who are active in the industrial field as well as the residents who consume UA products, UA keeps them healthy. It plays a significant role in programs and projects that target, the environment, health and nutrition, income generation, enterprise development, youth and women, water and sanitation, and food production and supply (Smit, et al., 2001). Most of the urban cultivation is being done by the urban poor who consume most of the production and they provide the local market with the supply food (Bryld, 2003).

In UA women have a significant role within cultivating vegetables and fruits and breeding animals in the home and rooftop gardens. In contrast, men mostly have the main role of sale the fresh products at the local markets. The roles are depending on the cultural, traditions, and values for each community. In GS, women have a significant role in weeding and harvesting, and they can sell fresh products at the local markets in case the markets are close to their home.

According to a report issued by RUAF in (2014), urban farming has an influence on the following aspects (RUAF, 2014).

Figure 4: Urban Farming Influence



Source: Made by the Researcher

Food security (availability): The most important role of UA its contribution to food security and healthy nutrition. Through improving food availability and accessibility by the regular and stable provision of fresh vegetables, fruits, meat, and egg. In many cases, food production within the city is a reaction of the urban poor to inadequate, unreliable and irregular access to food, and the lack of purchasing power.

When every single person, from infant to elder, does not have sustainable access to nutritious, culturally enough food, then food insecurity or food poverty exists. When the level of urban poverty increases and evidence indicates that food security and nutrition are worse among the urban poor than the rural poor, food security is becoming an increasingly critical issue. A study carried out by International Food Policy Research Institute (IFPRI) stated that in eight big countries (representing two-thirds of the world population) found that poverty in urban areas is increasing more than in rural areas, and the existence of poverty moves to urban areas (Mougeot, 2000).

(Veenhuizen, 2014) Mentioned that the contribution of urban farming to food security and nutrition is the most important advantage of UA (Veenhuizen, 2014). Renewed interest in looking at alternative strategies to improve the urban livelihoods, for income increasing and for urban food security and nutrition among others has arisen with the wide increase in urban poverty, food insecurity and malnutrition now seen as migrating from rural to urban areas. For many urban dwellers, UA is a livelihood strategy providing food and as a main or secondary source of income. In most countries, complement rural agriculture and increases the quality of the national food system (FAO, 2017).

Both studies (ETC Netherlands, 2003) and (Ellis and Sumberg, 1998) stated a distinction that is often made in the literature refers to the extent to which urban HHs that involve in agriculture have some degree of market orientation or are purely producing agricultural products for own-utilization. There seems to be an agreement that the direct food security purpose prevails, but there is a substantial number of urban farmers also use their products to the market selling, as in Latin America and a bit less so Africa. Thus, this means that the UA has twice positive direct effects on the practitioners the first one is improving the HHs food security status through cultivating and consuming the fresh food, and the second one increases their income through sale the fresh food at the local markets and get on a new income source that will invest in the other life aspects such as saving, education and health (ETC Netherlands, 2003) and (Ellis & Sumberg, 1998).

According to local ecological conditions and habitat, urban conditions are contributing to the dense production of perishable foods (vegetables, fruits, fish, meat, and dairy products). These foods, which are rich in fundamental nutrients, are consumed by urban dwellers. Some are consumed by the families engaged in production, processing and distribution. Therefore, contribute directly to improve the level of their food security. However, it is important that this food is to be safe and properly prepared, selected, and disseminated within the family to improve the level of the HHs food security and nutrition (Ayaga, et al., 2004).

(ETC Netherlands, 2003) Stated that urban farming can have a role in urban food security in several ways. It can be a source of income for the involved HH; can provide immediate access to a wider number of nutritionally rich foods (fruit, vegetables, and meat) and a more diversified diet and the mothers can spend more time for their children caring. In addition, by practising urban agriculture, the stability of HH food consumption against seasonality or other temporary shortages can be increased, unlike to the non-urban agricultural activities that are located far away from home (ETC Netherlands, 2003), (Maxwell, et al., 1998), and (Armar-Klemesu, et al., 2000). Although the poorest suffer from lack access to land, there is some evidence that the poor HHs, not the poorest, are mostly engaged in UA, (Haddad, et al., 1999).

(Smit, et al., 2001) Indicated that in most - lower-income countries, UA is a complementary part of the urban food supply. It aims to provide products that rural farming cannot supply perishables. As well that can be easily rotten during the transportation process, high-value crops that need close monitoring of the market, and certain export crops which need prompt delivery when ready. It is thus complementary rather than competitive with rural farming, increases the efficiency of the food supply and further contribution to the national economy (Smit, et al., 2001).

Urban food security is often interrelated with urban agriculture, especially for millions of urban poor who strongly depend on cash to obtain their food. Self-production is an important strategy for food security improving with insufficient income. Most urban farmers are amongst the low-income people, producing first for the consumption of the HH. Improving the level of the HH food security is the main objective for the poor to cultivate in cities, as is revealed by many pieces of evidence from countries in Africa, Asia and Latin America (Smit, et al., 2001).

Economic impact and income: UA play an important role in improving the economic situation. It can be a suitable source of income for the urban poor HHs through sale the fresh crops, meat, and egg at the local markets. (Bryld, 2003) stated that UA has an economic benefit as it is helping the poor urban farmers to use their income obtained from the non-farming activities for other purposes, such as health and education. That lead to improving their well-being as well instead of purchasing food, for example, it improves the welfare of urban farmer HHs (Bryld, 2003). According to the Global Monitoring Report (2012) In developing countries the poor HHs normally spend 50-70% of their earnings for food purchasing; therefore, it appreciated the benefits of self-growing crops or taking part in other types of urban farming by the urban poor (Verbeek, et al., 2012).

(Smit, et al., 2001) Indicated that the food costs of the non-farmer represent a substantial contribution of total HH expenditures in most low-income communities. Approximately 40-70% of the family budget in urban areas of low-income countries is spent on food purchase. However, the poorest people in these cities spend 60-90% of their total income to purchase food, and thus often experiencing hunger when such price levels cannot be affordable. UA can make a crucial contribution to the poor urban HHs' economy (Smit, et al., 2001).

(UNDP report 1996) Stated that most of the income of the urban poor is spend on food. Therefore, a little will be left for health, education and other HH necessities. Thus, it is not surprising that practising UA contribute to improving the status of food security for the urban poor. Not only food intake quantity can be improved, but also the value of the nutrition if the poor HHs grow vegetables, chickens and fruits by themselves (Bryld, 2003) and (UNDP, 1996).

Environmental advantages, natural resources (NR) and cities sustainability: UA is practised in most cases in marginal open spaces within or adjacent to the cities where lands are non-suited for other uses. Therefore, it creates more beautiful scenes and landscapes, and improved microclimate, and improve nutrient recycling (Bryld, 2003).

UA is keeping the NR and make the cities are more sustainable through the agricultural technics that using such as the aquaponics system which consists of combine two systems the first one is aquaculture and the second one is hydroponic. This system is saving more than 50% of the irrigation water comparison with the rural agricultural. Using the solid wastes and the treated wastewater as organic fertilizers and avoid the chemical that has negative impacts on the soil and environment. Keeping the crops protect from the diseases, produce healthy crops and high-density crop production. In addition, creates ZERO waste. Therefore, UA is very environmentally friendly, and the harvest methods as very simple. As well as, use the food waste of HHs either to feed the animals or produce organic compost (FAO, 2013).

Social advantage: Urban farming practitioners are those who are coming from different groups of the urban community. They can be the rich or the poor, women or men, and they can be natives or migrated from rural areas and so on. The immersing of women and other marginalized families in this sector draws attention and implies the important role of the sector to alleviating poverty and integrating urban societies (RUAF, 2014). The UNDP 2016 report added that urban farming has a critical role to improve social equity by improving the health and productive capacity of poorer people and by providing them with opportunities to make more income. According to the UNDP report, approximately 800 million people from all over the world are engaged in the different activities of urban agriculture, 200 million of them are full-time (UNDP, 1996).

2.3.2 Challenges of Urban Agriculture

Despite the benefits of UA as mentioned above, it also has some challenges worth mentioning as follows:

Space for cultivation: Agriculture requires lands for cultivation. However, there is lack of space for growing crops in cities due to the high rate of urbanization. As reported by (Bryld, 2003) the homeless are in urgent needs to be provided with safe shelters besides feeding the poor people in the cities. Since growing the food in cities needs land, it may not be prioritized in urban land uses because the demand for urban spaces to build housing units is in somehow more important than using spaces for agricultural activities (Bryld, 2003).

Access and control to land: Land access can be one of the biggest challenges for urban farmers due to high land prices for purchase or lease. In addition, a lack of suitable space for farming and the potential prohibition of farming activities may in some zones. Also, there may be no formal leasing structure for available land. With farmers investing in soil inputs and production, long-term stability of a site is essential for ongoing success. In addition, it may be some conditions by the government or the landlord that limit the control of land using for specific agricultural activities or using water sources (Dorward, et al., 2013).

Access and control to water: Irrigation can be a challenge if the infrastructure is not in place if the water source is limited or lack of control over water sources (e.g., well water), which adds an extra cost. There also may be concerns around the use of potable water for irrigation in terms of straining local drinking water resources and adding costs for the general tax base. Accessing water for gardening or small-scale farming can be a more serious concern in places with water restrictions or a lack of ground or surface water access. In addition, municipal water hook-ups may be expensive or simply not available (Dorward, et al., 2013).

Policy, regulation, political, and support: Urban farming activities on non-agricultural lands are often limited by lack of support for urban farming or policy and regulation that may or may not apply to urban farmers (Dorward, et al., 2013).

(Mougeot, 2000) stated that when urban and peri-UA is legalized and is better regulated as well as overcome on the challenges of access to lands and water as mentioned above, and based on assessment for many cities around the world, the beneficial effect of farming in cities can be widening towards the provision of better nutrition, poverty alleviation and more job creation (Mougeot, 2000).

Health problems: If it is not organized well, urban farming can be a health hazard. The resources of cities such as water and urban wastes can be used for production. The crops and livestock can be contaminated and then become health hazards to human beings due to the using of polluted rivers or wastewater and untreated compost. There are several worldwide cases when urban farming brought health problems for its practitioners and for the neighbouring people as well (UNDP, 1996).

Authorities perception: Most urban planners and environmental managers, either with the government or even with NGOs, have more concentration on the economic benefits of UA. While doesn't pay enough attention to the other benefits of UA, and this can be considered as the greater challenges in the implementation of UA. (Quon, 1999) Revealed that the ignorance of the social and environmental benefits of UA make the government response improperly in the land use planning process, and therefore fewer resources, financial and technical support are provided (Quon, 1999).

2.4 Theory of Evaluation

Evaluations are carried out using social research methods and practices to measure what changes the programme, projects and policies have contributed to and to get a mature understanding of how it happened. The evaluation aims at increasing the knowledge about one or several aspects of the intervention for learning, informing decision-making processes, and being accountable to stakeholders, donors and citizens.

Development Assistance Committee of the Organisation for Economic Cooperation and Development (OECD-DAC) developed evaluation definition to bring consistency to evaluation processes which is "An assessment, as systematic and impartial as possible, of an activity, project, programme, strategy, policy, topic, theme, sector, operational area, or institutional performance. It analyses the level of achievement of both expected and unexpected results by examining the results chain, processes, contextual factors and causality using appropriate criteria/dimensions such as relevance, effectiveness, efficiency, impact and sustainability" (UNODC, 2019).

Importantly, evaluation is not about fault-finding or judging an individual or a team. Rather, evaluation is an opportunity for internal and external stakeholders to contribute their knowledge and views about a particular intervention. At the end of the process, evaluation provides feedback, recognising achievements that have been made, identifying ways for performance improvement and supporting evidence-based decision-making (UNODC, 2019).

As mention above, the evaluation has five dimensions. Since the research is aiming to evaluate and measure the effect of "Urban Agriculture Project". Therefore, the research will focus on the effectiveness dimension to achieve its objective. Effective here is related to Sustainable Livelihood Framework (SLF) outcomes that include (income, food security, and sustainable use of natural resources). In addition, the feedback loop from outcomes to three capitals that include (human, financial, and physical).

2.5 Previous Evaluation Studies Related to Effects of UA on Food Security and Income

The following study was aimed at assessing the contribution of UA in alleviating urban food insecurity at the HH level in Addis Ababa- Ethiopia with reference to the Akaki-Kaliti sub-City (Adera, 2015).

The study's target population is composed of both urban poor HHs engaging in UA and those who are not engaging in UA. The study focused the HH head is operationalized as the main source of food and income of the HH; among those practising UA. In addition, focused on HHs with inadequate income and with unemployed HH. The study sought to investigate the relationship amongst the different dimensions of food security and the HHs status in relation to engagement in UA along with their average daily income.

The result of the study revealed that one out of two of the HHs sampled from both low incomes and unemployed engaged in at least one form of UA farming. The result also indicated that HHs who engaged in farming have earned more food and cash income; this has contributed both to improving HH food security by improving food availability 50%.

The study reveals people that are engaging in UA started their engagement due to low food supply at the HHs level, low income and unemployment. The results indicate that the role of UA for food security is manifested in different ways.

First, it was found out that engagement in UA determines food availability positively and significantly in the study's sample of poor urban HHs. That is, poor urban HHs who are engaging in UA are inclined to have more meals per day than their counterparts (those poor urban HHs who are not engaging in UA).

Second, it was found out that engagement in UA determines food access positively and significantly in the study's sample of poor urban HHs. That is, poor urban HHs who are engaging in UA are inclined to have more food group consumption per day than their counterparts. In this regard, an empirical study conducted on UA by (Zezza and Tasciotti, 2010) asserts, HHs that engage in farming may have access to comparatively cheaper food and to a wider variety of particular nutritious foods such as vegetables and products of animal origin (milk, egg, and meat). The same study highlights UA does appear to be associated with greater dietary diversity and calorie availability, both measures of an improved diet and hence closely related to food security (Zezza & Tasciotti, 2010).

Third, it was found out that engaging in UA production would create a conducive or favourable environment whereby food adequacy will be substantially improved thereby promoting food security. There is a strong and positive relationship among engagement in UA and food adequacy status within the study's target population.

Fourth, it was found out that food stability as a measure of food security has a statistically significant relationship with engagement in UA within the study's sample population composed of similar socio-economic status.

In a nutshell, UA contributes significantly and positively in alleviating urban HHs food insecurity and has a signifying effect on increasing income in the study area, Akaki-Kaliti sub-City.

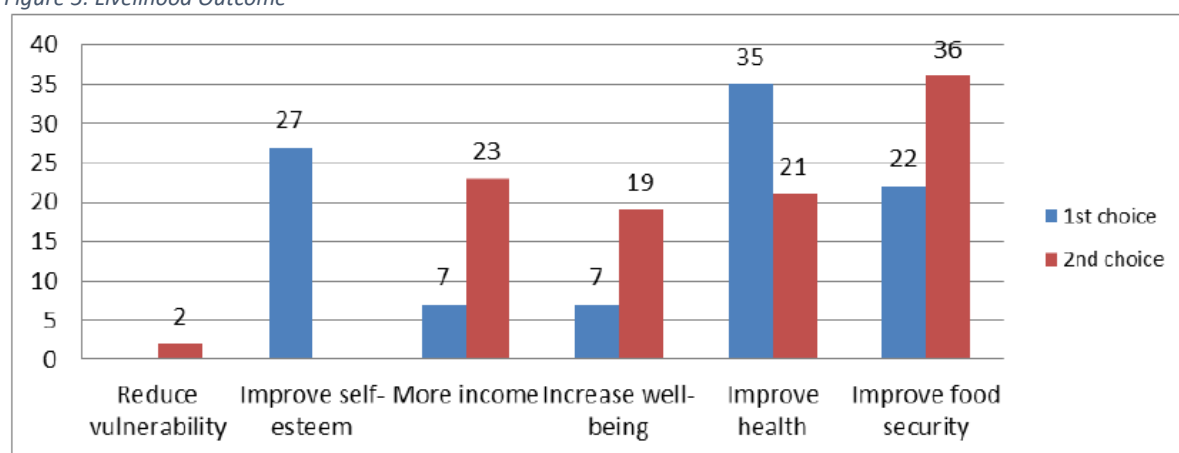
Another study conducted under the title of “Assessment of Urban Agriculture as A Livelihood Strategy for Household Food Security: An Appraisal of Urban Gardens Project in Langa, Cape Town - South Africa”. Resulting in UA has been advocated as a livelihood strategy to improve food security (Philander & Karriem, 2016).

The results attest that 82% of the respondents indicated that urban food gardens contribute to improving their HH food security. However, low levels of food security still experience within the community. With the Sustainable Livelihood Approach as a theoretical framework, the study accentuates other livelihood outcomes of UA such as improving health, self-esteem and food security.

Most of the respondents indicated that improving their health 35% would be their 1st choice as a livelihood outcome (see figure 5). Secondly, 27% indicated that they would like to improve their self-esteem. This agrees with the Oxfam report stated that individuals who were hungry lost their self-esteem as they need to ask or beg for food (Oxfam, 2014). Thirdly, 22% would like to improve their food security.

As their 2nd choice, 36% of the respondents would like to improve their level of food security, 23% would like to improve their income and 21% would like to improve their health.

Figure 5: Livelihood Outcome



Sources: (Philander & Karriem, 2016)

The principle outcomes and benefits of participation in urban food gardens project in this study are improving food security 58%, improving health 56%, creating employment 37% and improving self-esteem 29%. Subsequently, urban food gardens can be considered as a livelihood strategy.

Another study conducted under the title of “Good Food Program & Urban Agriculture Program Evaluation Report” at Toronto’s in Canada. These programs are aimed at helping people living in low-income communities save money and eat healthier by improving their access to fresh and affordable vegetables and fruit (HCA, 2017).

The project participants widely reported that the project was beneficial to them in terms of helping to access healthy food and to save money. Focus group participants indicated that food freshness, convenience, and affordability are their priorities in terms of what they get out of the program. It was also widely reported by participants that the socialization and sharing of ideas with other participants was greatly appreciated and helped them establish connections within their community. The study assessed the following outcomes:

Improved food availability

More than 80% of all survey respondents from the UA program indicated that the program helped them to access fresh vegetables and fruit in less time. More than half of all Balcony Garden participants (who grow food at home) indicated that the project allowed them to access fresh foods in much less time.

Participant eating habits: The majority of UA survey respondents indicated that they increased the number of fresh vegetables and fruit they eat since they joined the program. More than half 52.7% of UA respondents indicated that they ‘eat a lot more’ vegetables.

Effect on income and expenses

More than 55% of all survey respondents from the UA Program indicated that the program was either ‘Extremely’ or ‘Very’ helpful in terms of saving them money. Balcony Gardeners were the most likely of all survey respondents to report that the project was ‘Extremely’ helpful (41.4% of all valid responses from Balcony Garden respondents).

Impact on natural, environmentally practices, and green spaces

In the broadest terms, UA participants reported that the program allows them to engage very actively and tangibly in the food system. Many participants expressed their interests in creating more environmentally sound practices in their communities. These programs bring awareness to the importance of healthy soils. Composting efforts are also widely discussed alongside waste management efforts as community gardens try to establish best practices for management of composting organic waste. Parallel to these initiatives, UA respondents reported that they have learned about and are applying environmentally friendly pest control efforts. They avoid the use of potentially harmful chemicals while still managing to prepare and profit from healthy gardens.

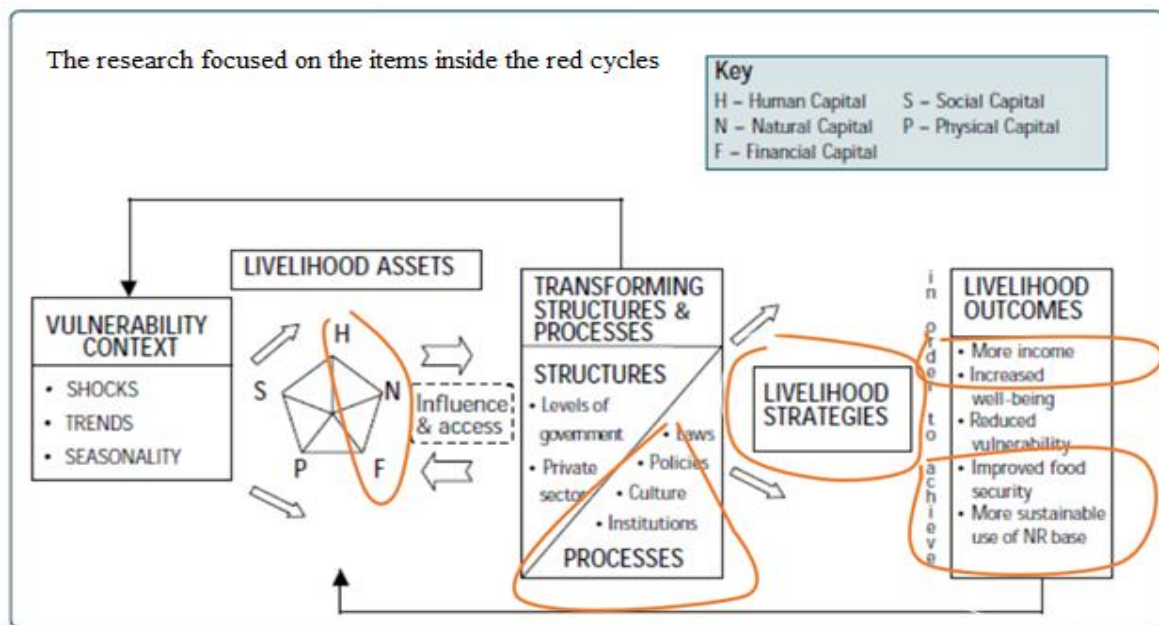
2.6 Conceptual Framework

The research evaluates the effect of using UA as a livelihood strategy on the following key concepts (food security, income, and sustainable using of natural resources).

In addition, assess the effect of feedback loop of these key concepts on human capital in term of investment in education and health, financial capital in term saving money for different purposes, and natural capital in term of UA friendly environmental practices as irrigation water-saving system. Moreover, the research provided UAWC as an institution with recommendations that will help to modify its strategy. Therefore, the most suitable conceptual framework that can link all these concepts together and use as tool analysis was Sustainable Livelihood Framework (SLF).

2.6.1 Sustainable Livelihood Framework (SLF)

Figure 6: Sustainable Livelihood Framework (SLF)

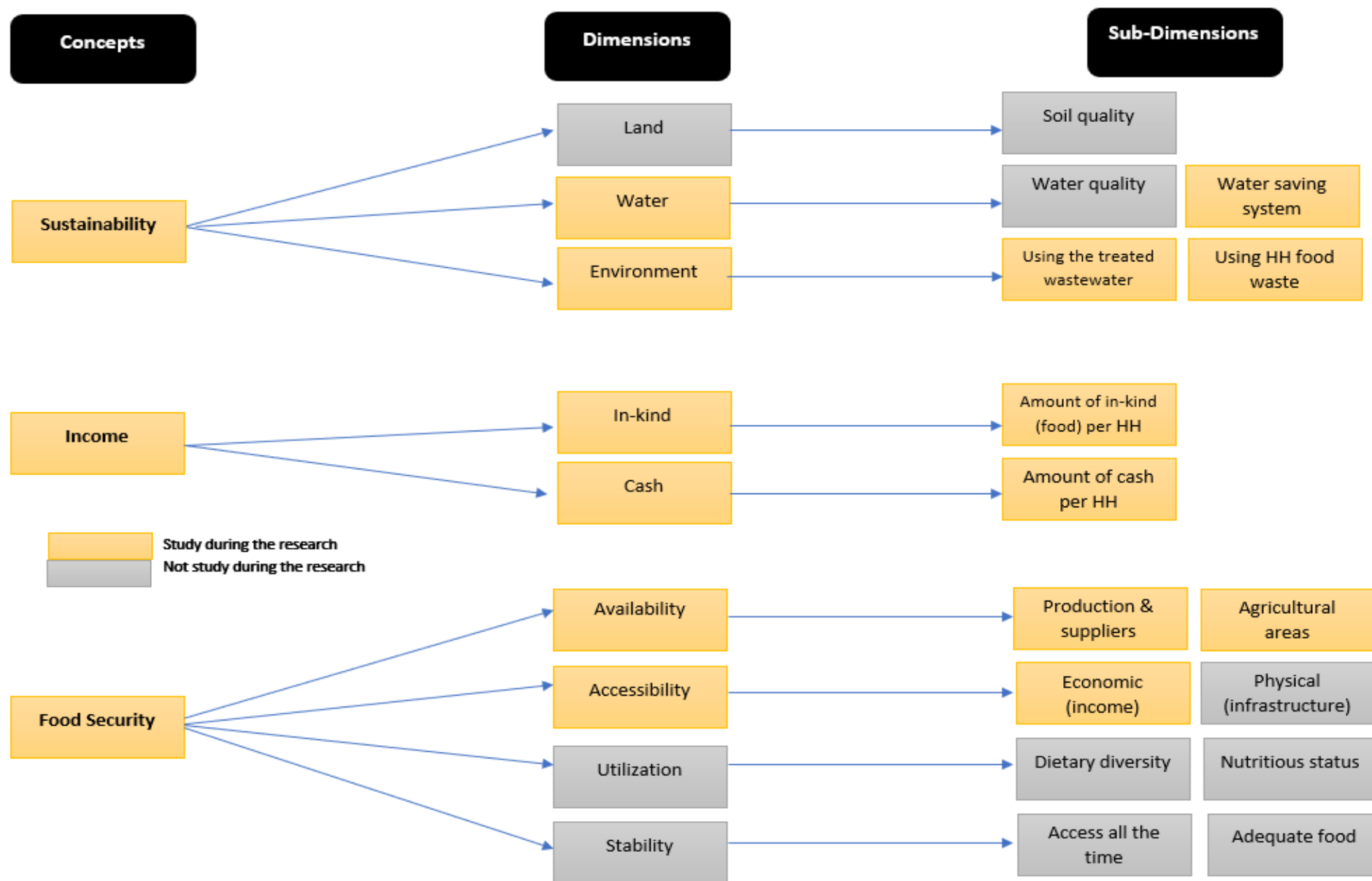


Source: (DFID, 1997), adapted by the Researcher.

2.7 Operationalization of Concepts

Based on the literature review the following operationalization of concepts were developed

Figure 7: Operationalization of Concepts



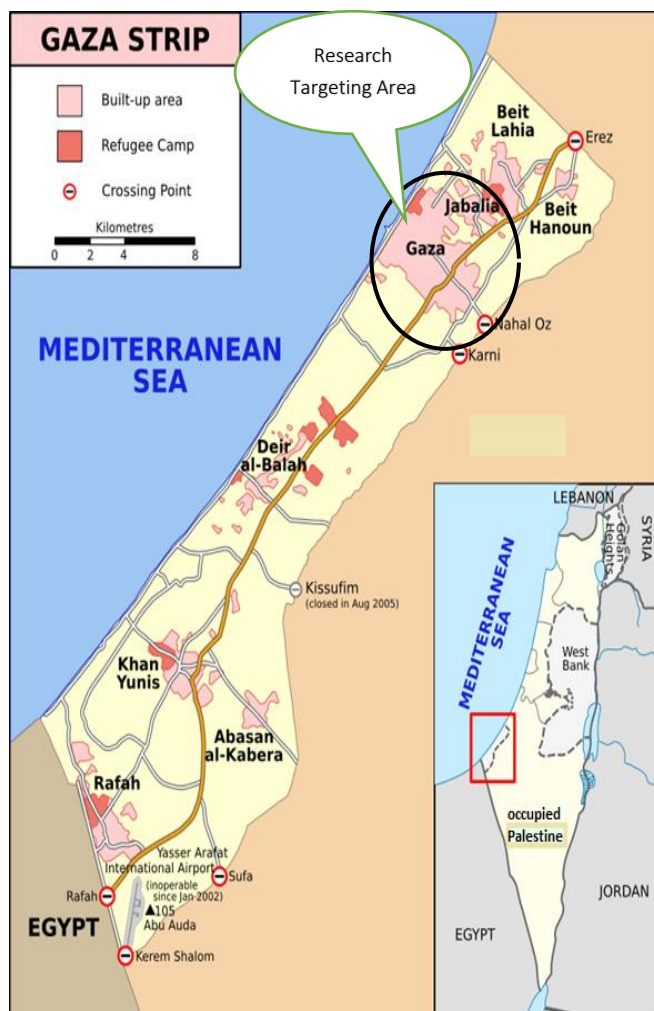
CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1 Area Description

GS is part of the Occupied Palestinian Territory and is a narrow Mediterranean plot with a total area of 365 square kilometres. The population of GS is about 2 million (PCBS, 2017). Therefore, Gaza has the highest population density in the world. It is bordered by the Mediterranean Sea in the west, Egypt in the south and Israel to the north and east, which is about 41 km long and 6 to 12 kilometres wide. Geographically, the area is located between latitudes 31-25 north and longitudes 34-20 east.

GS is divided into five administrative governorates, roughly equal; Gaza governorate is the administrative and commercial centre of the strip. More recently, natural growth, supported by high fertility rates in the context of strict restrictions on the movement of people outside of GS has been the main driver of population growth. The population of the GS is growing further to 2.2 million by 2020 and to 3.1 million by 2030 (UNSCO, 2017).

Map 1: Gaza Strip Map



Source: (Map of the World, 2016)

The majority of Palestinians in GS are UNRWA registered refugees and live in urban areas. There are approximately 1.35 million registered refugees represented about almost 67% of the population. Most of the population around 73.9% live in urban areas, 9.5% in camps and only 16.6% in rural areas (PCBS, 2016).

GS has a moderate climate, with mild winters, hot summers subject to drought. Rainfall in GS has unevenly distributed it varies considerably by governorates from the north to the south with a long-term annual average rainfall of 372 mm (PWA, 2013).

The average daily temperature ranges between 25 C in summer to 13 C in winter. August is the hottest month with an average temperature of 25 to 28 C, while January is the coldest one with an average temperature of 12 to 14 C.

The agricultural sector has the largest losses during the last three wars as about 36,000 ton of artillery heavy shells and rockets have been landed on farmlands. The losses in the agricultural sector estimated about 76% of the total damage, and about 213 hectares of agricultural land areas in the north of GS only were destroyed in 2014 (MoA, 2014).

3.2 Location of the Study

Gaza city is located at the central of GS. According to the report published by Palestinian Central Bureau of Statistics (PCBS), the estimated population of Gaza city is 652,597 inhabitants (PCBS, 2017) as the highest populated area comparing to all GS areas. The annual population growth rate is 3.3% (PCBS, 2016). The unemployment rate is 48.2% (PCBS, 2017). The estimated cultivation areas at Gaza city is about 364.2 hectare (MoA, 2015-2016). Gaza city municipality consists of the following zones: Beach Camp and the Mediterranean Sea in the west, Gaza in the middle and east, Al-Zahra, Moghraqa, and Joher Al Dek in the north.

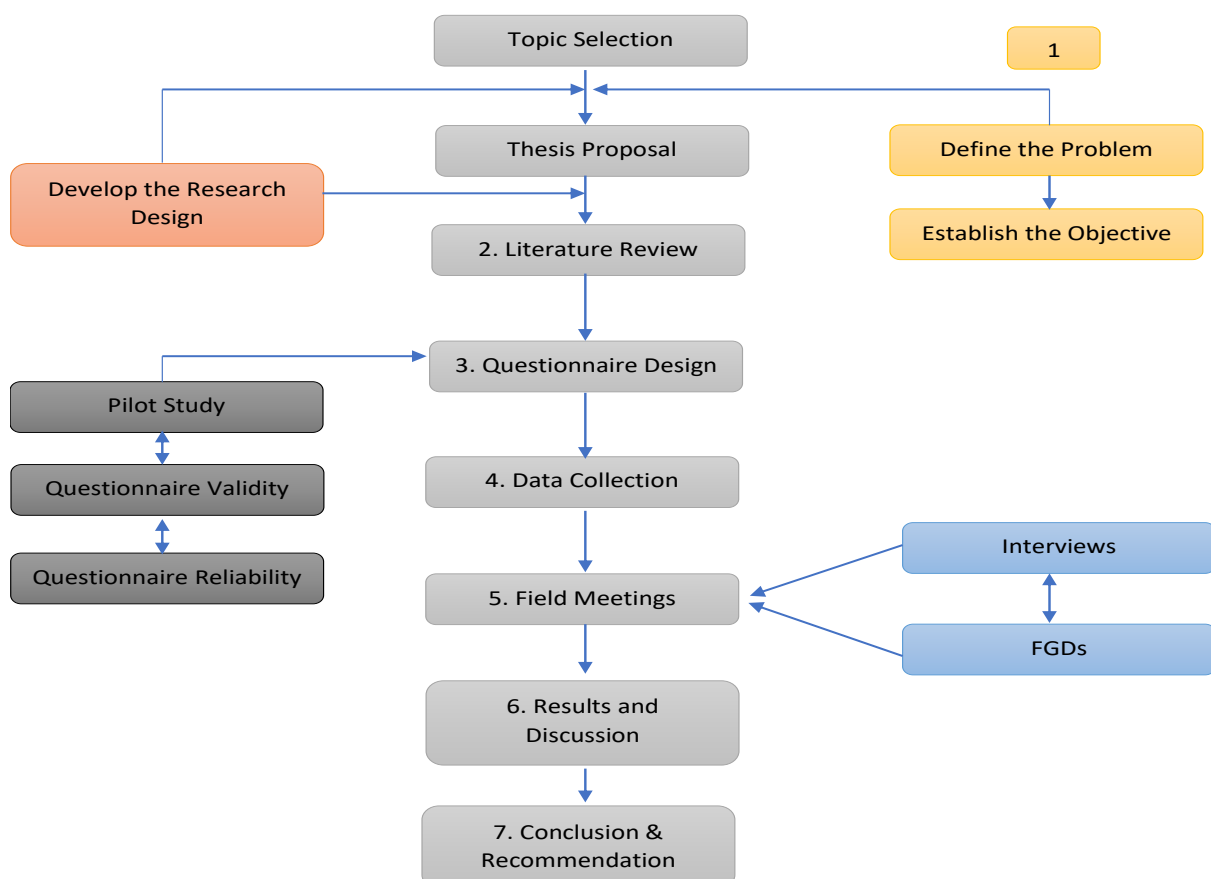
Gaza city selected as a research area and the research covered all its zones. Because it is the most urban governorate and the highest population and unemployment rate compared with the other governorates. Gaza city has the highest ratio of food insecurity. In addition, the project that the research evaluated its effects targeted about 60% of its target groups from Gaza city and the rest from the other four governorates. Therefore, the effect of the project is more visible and easier to measure at this governorate.

3.3 Research Methodology

The adopted strategy that used to achieve the research objective and answer the research questions included desk study through the collected secondary data from a literature review related to UA and food security. In addition, the case study through the collected primary data from the questionnaires for gathering necessary data, semi-structured interviews with the key informants at UA, and focus group discussion with representatives of the target group for triangulation purpose.

The research included seven main stages, summarized in the below figure:

Figure 8: The Research Main Phases



The research was qualitative, quantitatively, and relied on the characteristics of the paradigm (social constructivist approach). Through our reality that determined by the perspective from which we look at it and the language we were describing. In the meantime, it was applied research designed to contribute to solving a specific practical problem.

Qualitative research is a holistic approach and primarily exploratory research. It used to gain a deeper understanding of root causes, perspectives of a smaller sample population, and drivers for the research problem. In the meantime, provided a good perception of the research problem that helped us develop alternative potential solutions.

Qualitative research is a systematic investigation of phenomena by gathering quantifiable data and performing statistical, mathematical or computational techniques. Quantitative research gathers information from existing and potential target groups using sampling methods such as questionnaires. The results can be depicted in the form of numerical data.

The research analysis unit was the HH, which we can define as all persons living under one roof or occupying a separate housing unit, having either direct access to the outside or a separate cooking facility. Where the members of a HH are related by blood or law, they constitute a family.

HH income is one of the factors that the research focused on in order to distinguish between UA products that consumed at the HH level included all the varieties of the fresh food that requested to achieve good dietary diversity and healthy life for the all the HH members. In addition, another's UA products that sold at the local markets in order to get on income. We can define the HH income as the total income from all the people who live in one HH, it includes salaries, benefits and receipts from personal business, agriculture activities, exchange goods, and in-kind assistance (Lougee, 2018).

3.3.1 Data Sources

Data sources included both primary and secondary data. Therefore, a combination of qualitative and quantitative data was used. In addition, a variety of methods have been used to make triangulation and confirm the same data from different sources, thereby increasing the validity and credibility of the results.

Therefore, questionnaires, interviews, and FGD have been used as primary data sources. The secondary data sources included previous journals, reports, papers, books, statistics, and web sites.

The questionnaire targeted the target group of the UA project as a purposive sample. The interviews targeted key informants to collect qualitative and quantitative data that were not obtained through the questionnaire. The data required from the key informants for the project itself were such as the characteristics of the project on paper and what actually happened, the criteria for selecting the target groups, and the quality of the project. The aim of the FGD was to verify the information and data provided through the questionnaire and interviews. It was a good opportunity to increase the validity and credibility of the results.

The table below explains the methods of data collection and the targeted respondents to answer the sub-research questions:

Table 1: Methods of Data Collection and Respondents

Sub- Question No	The Methods of Data Collection	The Respondents
Sub - Question (1)	1. The project documents. 2. Semi-structured Interviews.	UAWC. Key Informants.
Sub - Question (2)	1. Literature review. 2. Semi-structured Interviews. 3. Questionnaires. 4. FGDs.	Key Informants. Urban farmers. Urban farmers.
Sub - Question (3)	1. Literature review. 2. Questionnaires. 3. Semi-structured Interviews. 4. FGDs.	Urban farmers. Key Informants. Urban farmers.
Sub - Question (4)	1. Literature review. 2. Semi-structured Interviews. 3. Questionnaires.	Key Informants. Urban farmers.
Sub - Question (5)	1. Questionnaires. 2. FGDs 3. Semi-structured Interviews	Urban farmers. Urban farmers. Key Informants.

3.3.2 Sampling

In any research, interviewing or collecting data from the whole population will be a big challenging. However, identifying a representative sample from the population for the research will be cost and time effective, the results will be more accurate, the speed of data collection will be quicker and there will be fewer challenges with the availability of participants for the research.

The non-probability (purposive) samples have been selected. Thereby the researcher selected his own sample that serves the research objective, questions and brings the requested data.

The target population who selected to fill the questionnaire was 40 urban agricultural farmers (producers). Those who benefited by UAWC “UA Project” in 2017 and living at Gaza city. The target population selected based on specific criteria included (at least 40% female-headed HH, 50% using UA products for subsistence, about 50% using UA products for both subsistence and sale at the local markets, focused on young beneficiaries to measure their income at the HH level, and finally related to the land ownership at least 50% of them who have their own land and the other who rent land).

The target population who participated in the FGD was 10 urban agricultural farmers (4 male and 6 female) (producers). Those who benefited by UAWC “UA Project” in 2017, living at Gaza city, and did not fill the questionnaire. The target population selected by the researcher based on the above criteria.

In addition, 5 key informants selected for semi-structured interviews. These were the UAWC director, MoA planning manager, external urban agricultural expert, local community leader, UN food security coordinator at GS. The interviews with the key informants conducted individually by the researcher via Skype.

However, I planned to carry out five semi-structured interviews with five key informants, but after finished data collection and analysing I discovered that some requested information to answer the research questions was lacking. Therefore, another extra one has been conducted with UAWC director in order to fill the information gap.

3.3.3 Data Analysis

Analysis of data involved summarizing the large data gathered and presenting the results in a way that communicates the most important features. The research data analysis strategy and the specific procedures followed to address the research questions and achieve the objective.

The necessary data has been collected, analysed and displayed in a numerical and narrative form. During this phase, the collected data has been checked, reduced, organized (coding), combined and compared. Then the data has been analysed using the statistical (EXCEL) and other packages for the social sciences. Descriptive statistics, cross-tabulations, included frequency counts, percentages, and other relevant data analyses presentation forms have been utilized in the research

3.3.4 Ethical Considerations

There were no risks for participants (rural farmers and the key informants) by participating in this research process. All the participants were treated in accordance with the ethical guidelines of science research. The participant's identities have been kept confidential and protected; moral standards have been applied to the decisions in planning, carrying out and reporting of the results.

CHAPTER 4: RESULTS

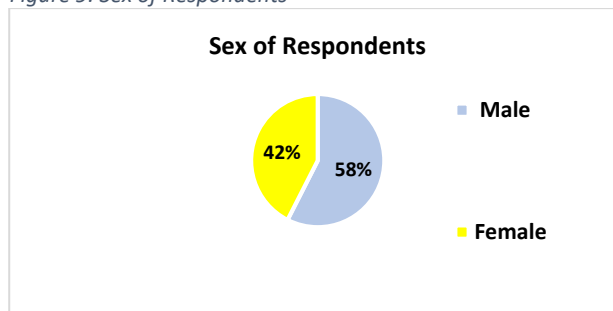
This chapter is based on data analysis and the presentation of descriptive and statistics. After the data were collected, the data was subject to written editing that resulted in the following discoveries that would answer the sub-questions of research.

4.1 *Presentation of the General Information Results for Questionnaire Respondents*

4.1.1 Sex of Respondents:

Figure (9) shows that 23 of the 40 respondents (58%) from "UA farmers" are male, while 17 of the 40 respondents (42%) are female. Keeping in mind that one criterion for sample selection is the selection of at least 40% female respondents.

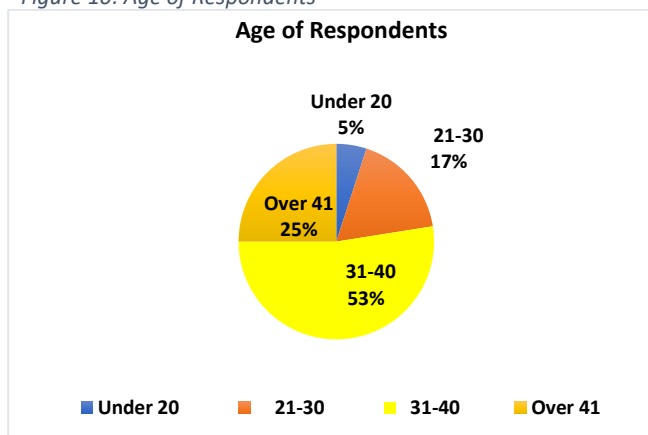
Figure 9: Sex of Respondents



4.1.2 Age of Respondents

Figure (10) shows that 2 of the 40 respondents (5%) are under the age of 20, 7 of the 40 respondents (17%) between the ages of (21-30), 21 of the 40 respondents (53%) between the ages of (31-40) and 10 of the 40 respondents (25%) over 41 years of age. The research focused more on young headed HH based on research sample selection criteria to measure the role and effect of UA on their HHs.

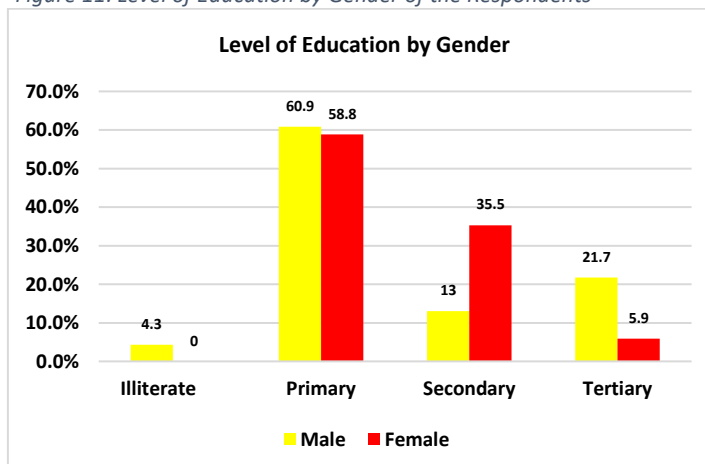
Figure 10: Age of Respondents



4.1.3 Level of Education of the Respondents

Figure (11) shows that 1 male of the 23 male respondents (4.3%) illiterate, 14 male of the 23 male respondents (60.9%) and 10 females of the 17 female respondents (58.8%) have passed primary education, 3 male of the 23 male respondents (13%) and 6 females of the 17 female respondents (35.3%) have passed secondary education, while 5 male of the 23 male respondents (21.7%) and 1 female of the 17 female respondents (5.9%) have university degrees in various fields.

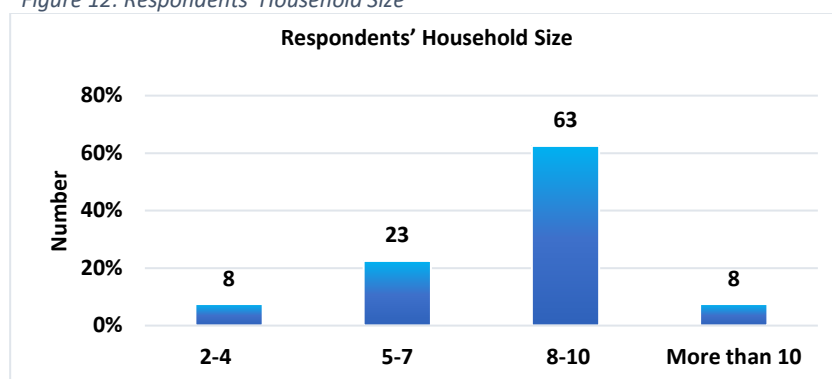
Figure 11: Level of Education by Gender of the Respondents



4.1.4 Respondents' Household Size

Figure (12) shows that 3 of the 40 HHs respondents (8%) (2-4) individuals, 9 of the 40 HHs respondents (23%) (5-7) individuals and 25 of the 40 HHs respondents (63%) (8-10) individuals, while 3 of the 40 HHs respondents (8%) have more than 10 individuals.

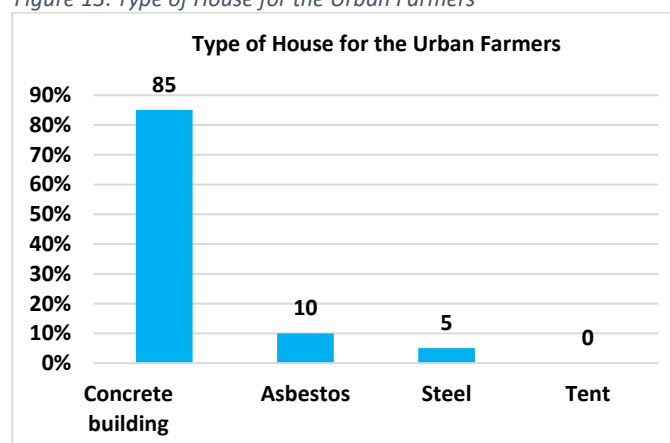
Figure 12: Respondents' Household Size



4.1.5 Type of House for the Urban Farmers

Figure (13) shows that 34 of the 40 respondents (85%) live in concrete buildings, 4 of the 40 respondents (10%) live in asbestos buildings, and 2 of the 40 respondents (5%) live in steel buildings (containers). The original houses of those farmers (who live in steel buildings) are demolished in the last war against GS in 2014, and they live in containers relief agencies have provided them. While there are no respondents' urban farmers living in tents.

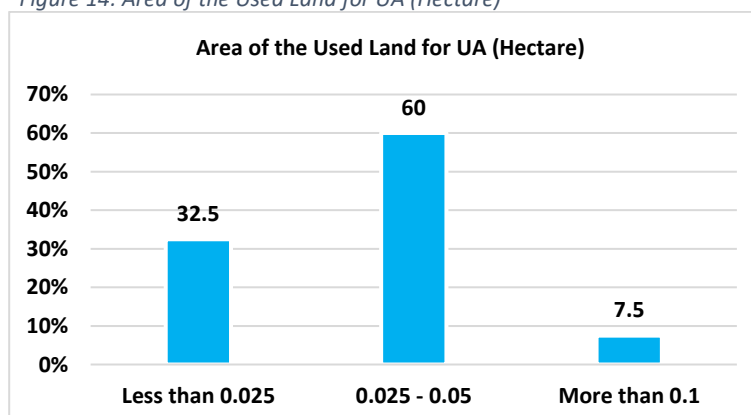
Figure 13: Type of House for the Urban Farmers



4.1.6 Area of the Used Land for UA (Hectare)

Figure (14) shows that 13 of the 40 respondents (32.5%) use less than 0.025 hectares for UA activities, 24 of the 40 respondents (60%) use land (0.025-0.05) hectares, while only 3 of the 40 respondents (7.5%) use more than 0.1 hectares. Keeping in mind that Gaza City is very small and lacks large paces of land due to high urban sprawl as mentioned during the FGD.

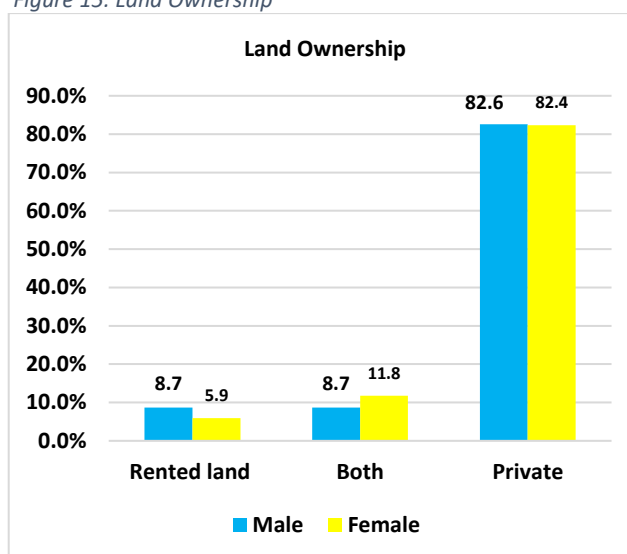
Figure 14: Area of the Used Land for UA (Hectare)



4.1.7 Land Ownership

Figure (15) shows that 2 males of the 23 male respondents (8.7%) and 1 female of the 17 female respondents (5.9%) rent land for UA activities, 2 males of the 23 male respondents (8.7%) and 2 females of the 17 female respondents (11.8%) use both rent and private, while 19 male of the 23 male respondents (82.6%) and 14 females of the 17 female respondents (82.4%) use their own land for UA activities. During FGD, participants stated that the main reason for renting land is for UA activities to produce enough fresh vegetables and fruits for HH daily consumption and sell the extra fresh food at the local market for more income.

Figure 15: Land Ownership



4.1.8 The Respondents Experience of UA Activities

Regarding the experience of the respondents, most of the participants in FGD stated that they were familiar with UA activities but not all the modern practices. The participants said that they have good practical experience in the traditional ways of growing fresh vegetables, fruits and herbs, as well as breeding goats and cheeps. In contrast, before practise UA activities, they did not have enough practical experience related to the aquaponics system as a modern agricultural system, which consists of hydroponic and aquaculture systems. They all agreed that after participating in UA activities and obtaining intensive hands-on training and extension services from NGOs, they had good experience and knowledge to work well in UA activities and modern systems.

4.2 Project Characteristics

4.2.1 The Project Characteristics on Paper and What Happened in Reality

UAWC director during an interview on 30th of July 2019, said that (UA project aims to improve food security status and the income of small-scale farmers at GS. He added that the project proposal consisted of 150 units for 150 beneficiaries, each unit consisting of one greenhouse (the size is 50 square meter) and one aquaponics system consisting of a hydroponic farm for vegetables, fruits, herbs and aquaculture fish fam. In addition, 1 goat, 2 cheeps, 2 rabbits, 9 chickens and birds. UAWC director added that unfortunately, the real total number of beneficiaries benefited from the UA project was 100 beneficiaries for a number of reasons, including:

- The donor's budget was lower than the budget required in the proposal.
- UAWC was unable to provide a greenhouse for beneficiaries because of raw materials prohibited by Israelis from entering GS under the pretext of dual-use (using in civilian and military activities).
- UAWC has not been able to provide beneficiaries with all kinds of medicinal herbs for the same reason.
- At that time, not all aquaponics raw materials were available at the local markets. Therefore, the total number of aquaponics units provided is 70 instead of 100.

With regard to the quality of the project, UAWC provided the best quality of raw materials in the domestic market, all of which have ISO certification and got on a certificate from Palestine Standards Institution (PSI).

UAWC director added that in terms of target group selection criteria, the main selection criteria included the following: small-scale farmer (who has maximin 0.2 hectares for agricultural purposes or 0.1 hectares of greenhouses), lack of regular source of income, the HH has students studying at school or universities, HH has an empty land at least 200 square meter or empty rooftop at least 50 square meter, HH has previous agricultural experience, and HH didn't benefit from any other agricultural project from another organisation in the last 2 years).

4.2.2 The Assistance that Gave to Start-Up UA Activities

All respondents indicated that they received in-kind assistance to start their UA activities in 2017 (all are targeted by UAWC project). The assistance included seeds, seedlings, organic fertilizers, nylon sheets, irrigation systems, goats, sheep, rabbits, chickens, a fish farm and a fence.

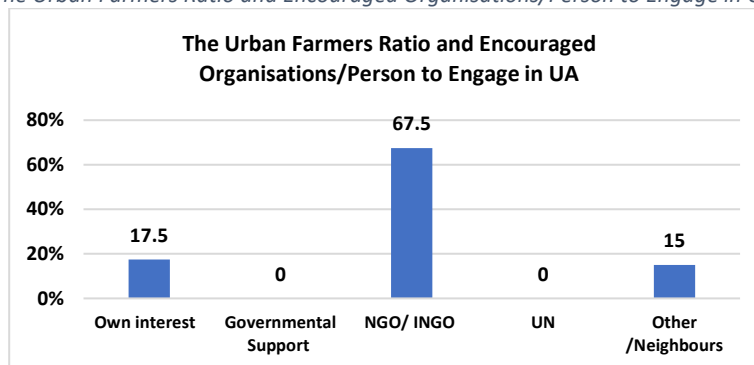
UAWC director mentioned that the UA project provided all the target groups with the requested UA inputs. In addition, UAWC staff provided the target groups with intensive practical training related to UA best practices, regular extension services and technical advice. He added that UAWC services are aimed to help target groups start-up their project that will contribute to improving their food availability by cultivating their own daily fresh vegetables, fruits and producing own animal products.

Furthermore, UAWC director added that in case UA practitioners have production surplus, they will sell it at the local markets in order to get on new sources of income that will invest at their life aspects such as education and health.

4.2.3 The Urban Farmers Ratio and Encouraged Organisations/Person to Engage in UA

Figure 16: The Urban Farmers Ratio and Encouraged Organisations/Person to Engage in UA

Figure (16) shows that 7 of the 40 respondents (18%) encouraged to participate in UA because of their own interest, 27 of the 40 respondents (67.5%) encouraged by NGO and 6 of the 40 respondents (15%) encouraged by their neighbours, while there was no one encouraged by the Government and UN agencies.



UAWC director mentioned that one of UA project objectives is to raise awareness of farmers about importance, benefits, and positive effects of UA on their life-aspects including food availability, increase HH income, improve HH health status and education level. He added that after the farmers realized the benefits and good practices of UA, they became to have more incentive, enthusiastic and passionate to practise UA activities. In contrast, some of the current UA practitioners got on motivation and encouragement to engage UA project from their neighbours who have previous background and knowledge about UA benefits.

4.3 Effect of “UA Project” on Food Security Status in term of Availability at the Small-Scale Farmers HHs at Gaza City

4.3.1 Type of UA Cultivated Crops by Gender, Age and Area

Figure 17: Type of UA Cultivated Crops by Gender, Age and Area

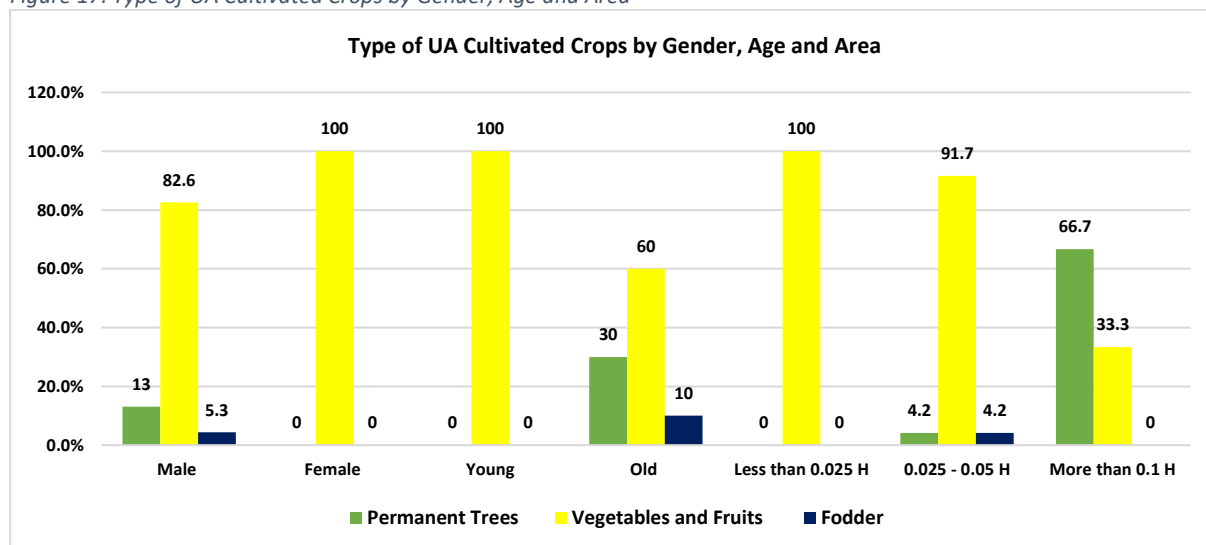


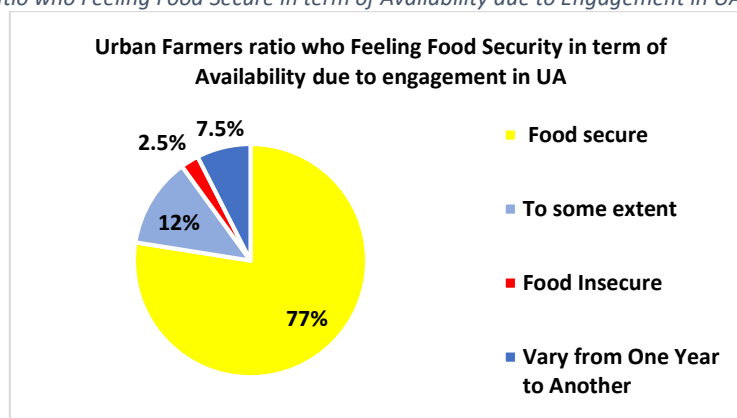
Figure (17) shows that 19 of the 23 male UA farmers respondents (82.6%) and 17 of the 17 female respondents (100%) cultivated vegetables and fruits. 30 of the 30 young UA farmers respondents (100%) and 6 of the 10 old respondents (60%) cultivated vegetables and fruits. 13 of the 13 UA farmers respondents (100%) who have land less than (0.025 H), 22 of the 24 respondents (91.7%) who have land (0.025 – 0.05 H) and 1 of the 3 respondents (33.3%) who has land more than (0.1 H) cultivated vegetables and fruits. In contrast, the rest of them cultivated either permanent trees or fodder.

Participants in FGD stated that most urban farmers preferred to grow vegetables and fruits because they could harvest three to five times a year based on crop type. In addition, this type of crop provides urban farmers HHs with daily and basic consumption food, which is the main source of HH daily food. By contrast, they added that farmers who grow permanent trees such as olives and citrus fruits harvest once a year and need a large area that they lack, while the feed is grown by farmers who breed milk animals but need as much space as well.

4.3.2 Urban Farmers ratio who Feeling Food Security in term of Availability due to Engagement UA

Figure 18: Urban Farmer's ratio who Feeling Food Secure in term of Availability due to Engagement in UA

Figure (18) shows that 31 of the 40 respondents (77%) feel food secure in terms of the availability of daily fresh food for HH consumption, 5 of the 40 respondents (12%) feel somewhat food secure, 3 of the 40 respondents (7.5%) feel food secure vary from one year to another, while 1 of the 40 respondents (2.5%) feel food insecure.



The FGD participants mentioned that there is a significant change in the food security situation before and after engagement UA project at their HHs level. They stressed that all of them were

suffering food insecure before engagement UA project causing the inability to meet their HHs daily fresh food. They emphasized that the majority of them right now became to have the ability to meet their HHs daily fresh food due to the engagement UA project.

They added that the underlying reason behind some UA farmers feel food insecure is a small amount of product compared with HHs needs. The HHs size for most HHs who feel food insecure is more than 10 individuals. In addition, some of those HHs prefer to sell their UA products at the local markets to get some cash in order to buy urgent medicines for HH patients.

As one participant in FGD said: (from my point of view, there are two main reasons for HHs that feel food insecure, the first is a large size of HH, and the second is that some HHs have other priorities such as buying medicines and clothes for their children. Therefore, they forced to sell the UA products they needed to feel food secure in order to meet their other urgent needs).

FAO Food Security Coordinator at GS during an interview on 3rd Aug 2019, mentioned that in order to achieve food security at the HH level, it should achieve four pillars of food security together which are availability, accessibility, utilisation and stability. He added that to successfully achieve food security, it should have provided HH with basic needs such as education, health, water and sanitation to ensure that food security can be achieved.

4.3.3 The Reason that HH Feeling Food Secure by Gender and Age

Figure 19: The Reason that HH Feeling Food Secure by Gender and Age

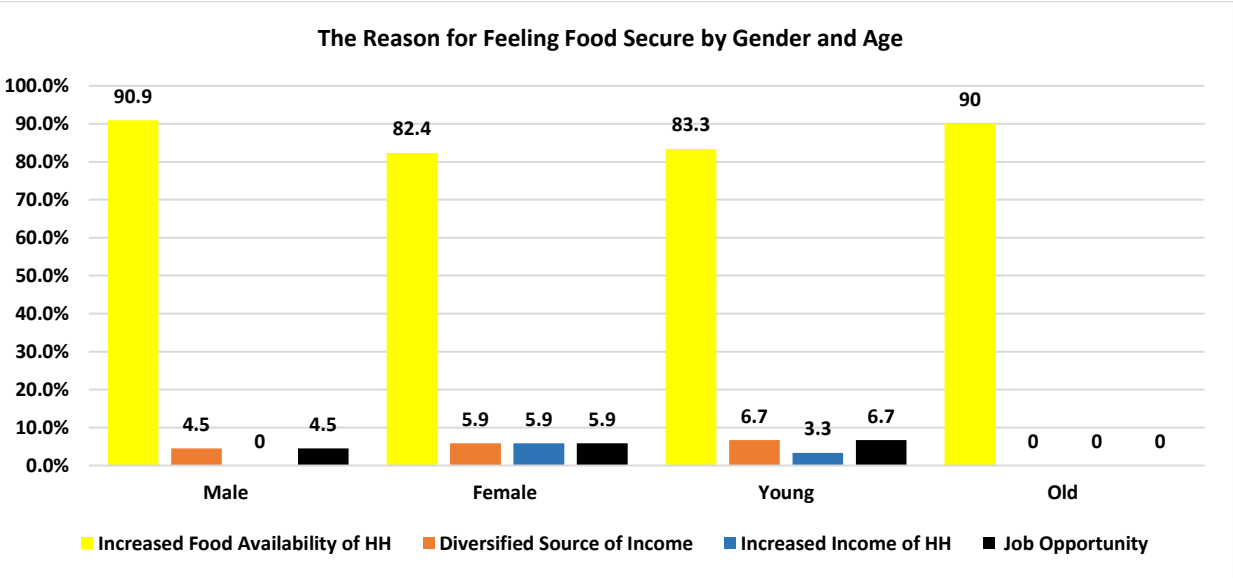


Figure (19) shows that 20 of the 23 male UA farmers respondents (90.9%), 14 of the 17 female respondents (82.4%), 25 of the 30 young UA farmers respondents (83.3%) and 9 of the 10 old respondents (90%) feel food secure because increased food availability at HH level due to the engagement UA project. In contrast, others feel food secure because other reasons such as a diversified source of income, increase the income of HH and create job opportunities. Taking into consideration only 1 old male (1 HH) out of 40 UA farmers feel food insecure due to his HH size in more than 10 individuals.

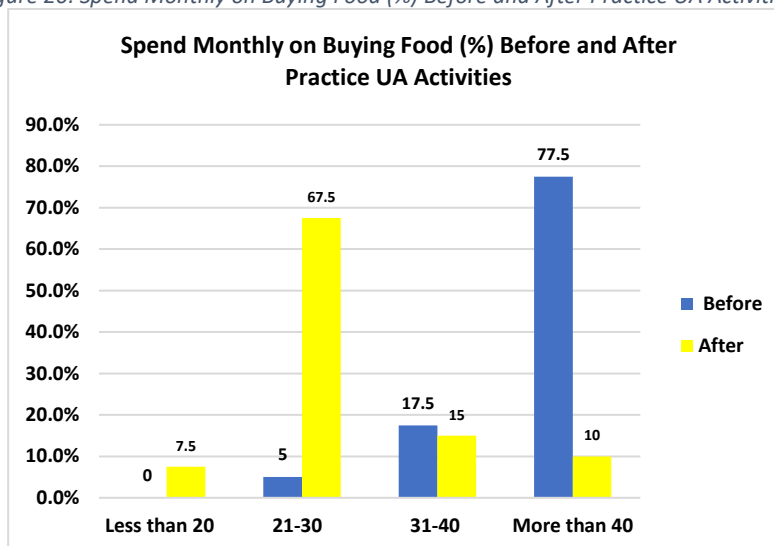
During the FGD session that conducted on 26th of July 2019, all the participants and the local community leader agreed that all urban farmers prefer breeding poultry and cultivate agricultural crops rather than other activities such as breeding rabbits and milk animals. Because these UA activities provide the basics and daily HHs needs for eating. In the same time, it decreases significantly

the amount of basic food that HHs need to buy from the local markets daily. In addition, they emphasized that most of the urban farmers who are breeding rabbits and milk animals sell their products at the local markets due to these products are highly profitable.

4.3.4 Spend Monthly on Buying Food (%) Before and After Practice UA Activities

Figure 20: Spend Monthly on Buying Food (%) Before and After Practice UA Activities

Figure (20) shows that there is a difference between the percentage of monthly spending to buy food before and after the participation of UA activities. 0% of respondents spent less than 20% of their income on buying food before participating UA activities, comparison after participation increased to 3 of the 40 respondents (7.5%) (meaning that the number of HHs that decreased their monthly spending on food purchases is increasing).



2 of the 40 respondents (5%) spent (from 21% to 30%) of their income on buying food before participating in UA increased to 27 of the 40 respondents (67.5%) after participating UA. 7 of the 40 respondents (17.5%) spent (from 31% to 40%) of their income on buying food before participating UA decreased to 6 of the 40 respondents (15%) after participating UA, while 31 of the 40 respondents (77.5%) spent more than 40% of their income on buying food before participating UA and decreased to 4 of the 40 respondents (10%) after participating UA.

MoA Planning Manager during an interview on 30th of Aug 2019, said that since the UA farmers engaged UA project one year ago there was no significant change in the prices of the fresh food at the local markets. Actually, the price fluctuation was there but within the annual average such as change the prices due to the harvesting seasons. In addition, there were no either natural or man-made disasters during the project period.

UA Expert during an interview on 4th of Aug 2019, said that there is a direct and positive relationship between the low monthly spending on food purchases and UA. He clarified that one of UA main objectives is to provide daily consumption of vegetables, fruits and fresh animal products that will reduce the amount of money that is supposed to be spent on purchasing food from local markets.

However, all the respondents mentioned in the questionnaire that sometimes they need to buy some fresh vegetable varieties from the local markets such as okra, onion, garlic and potatoes due to their UA production couldn't meet their needs of these products throughout the year.

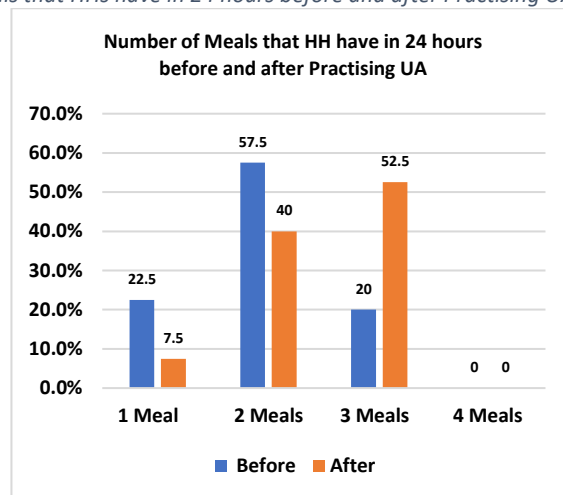
While MoA Planning Manager during an interview on 2nd of Aug 2019, said that (most of the poor people in GS who engaged at UA are trying to cultivate their daily vegetable needs in order to save their income to meet other needs. For instance, make rehabilitation or upgrade their homes, buy clothes and medicines for their children). He added that the reason behind buying fresh vegetable

varieties from the local markets is the HHs need a large amount of these vegetable varieties throughout the year, that difficult to get on that amount within their UA areas.

4.3.5 Number of Meals that HHs Have in 24 Hours before and after Practising UA

Figure 21: Number of Meals that HHs have in 24 hours before and after Practising UA

Figure (21) shows that ratio of HHs who take one meal in 24 hours is decreased from 9 of the 40 respondents (22.5%) to 3 of the 40 respondents (7.5%) (this means that the number of HHs who have more than 1 meal in 24 hours is increased), ratio of HHs who take 2 meals in 24 hours is decreased from 23 of the 40 respondents (57.5%) to 16 of the 40 respondents (40%) (this means that the number of HHs who have more than 2 meal in 24 hours is increased), ratio of HHs who take 3 meals in 24 hours is increased from 8 of the 40 respondents (20%) to 21 of the 40 respondents (52.5%), while ratio of HHs who take 4 meals in 24 hours is 0% before and after practising UA.



The FGD participants mentioned that after engagement in UA activities, there is a significant increase in fresh food availability and animal products. Therefore, HHs became able to eat more food during the day and encouraged to make more daily meals. Taking into consideration the meals input is from their UA products and its free.

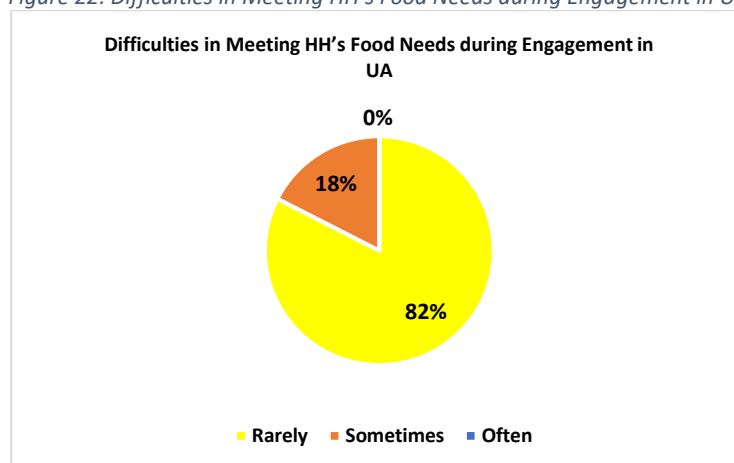
FAO Food Security Coordinator at GS during an interview on 3rd Aug 2019, said that the increase in the number of meals per day is an important indicator of improving the food security situation at the HH level. He added that an increasing number of daily meals meaning that increase food availability and physical and financial accessibility as well. Furthermore, there is a positive impact on food security in term of utilisation, due to most of the respondents mentioned that increase the availability of fresh vegetables and fruit is the main reason for feeling food security.

4.3.6 Difficulties in Meeting HH's Food Needs during Engagement in UA

Figure 22: Difficulties in Meeting HH's Food Needs during Engagement in UA

Figure (22) shows that 33 of the 40 respondents (82%) rarely have difficulties in meeting their HHs daily food needs during engagement UA, 7 of the 40 respondents (18%) sometimes, while there is no one often.

The MoA Planning Manager during an interview on 2nd of Aug 2019 said that the availability of fresh vegetables, fruits and animals' products depend on the harvesting seasons.



Therefore, sometimes the UA farmers lack to meet their HHs daily requested fresh food due to inability to harvest all products varieties throughout the year. He added that sometimes large HH size limit UA products to meet HH daily needs.

4.4 Effect of “UA Project” on the HHs Income at the Small-Scale Farmers HHs at Gaza City

4.4.1 Most Important Source of Income by Gender and Age

Figure 23: Most Important Source of Income by Gender and Age

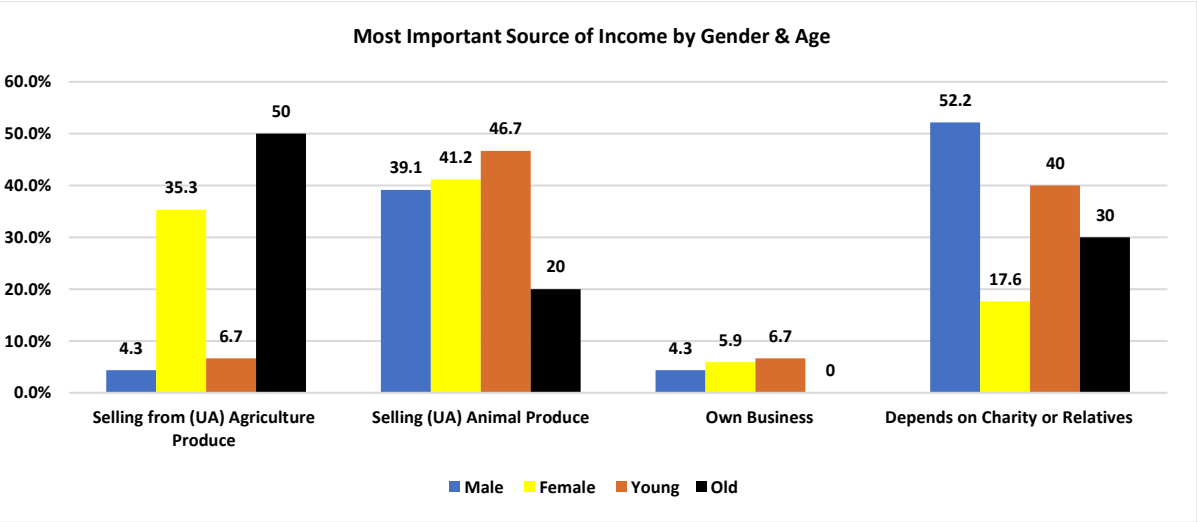


Figure (23) shows that 6 of the 17 female UA farmers respondents (35.3%) and 5 of the 10 old respondents (50%) consider that the most important source of income comes from the sale UA products (fresh vegetables and fruits) at the local markets. 9 of the 23 male UA farmers respondents (39.1%), 7 of the 17 female respondents (41.2%) and 14 of the 30 young respondents (46.7%) consider that the most important source of income comes from the sale of animal products such as eggs, milk and meat at the local markets. 2 of the 30 young UA farmers respondents (6.7%) consider that the most important source of income comes from their own businesses like small shops. 12 of the 23 male UA farmers respondents (52.2%), 12 of the 30 young respondents (40%) and 3 of the 10 old respondents (30%) consider that the most important source of income comes from charity and relatives.

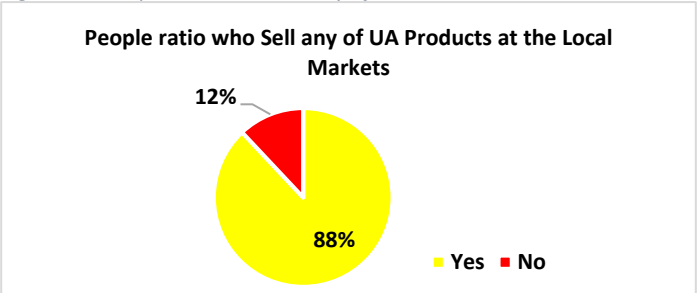
The FGD participants confirmed that most of them sell their UA products at the local market weekly, and they depend on this source of income to invest in education (pay university fees) and buy some types of medicines that unavailable at the governmental hospitals. Moreover, one of the participants said that (I’m saving this money to pay a dowry for my son who will be married next winter).

4.4.2 People ratio who Sell any of UA Products at the Local Markets

Figure (24) shows that 35 of the 40 respondents (88%) sell their UA products at local markets, while 5 of the 40 respondents (12%) do not.

The questionnaire respondents and FGD participants agreed that the main reason that prevents UA practitioners

Figure 24: People ratio who Sell any of UA Products at the Local Markets



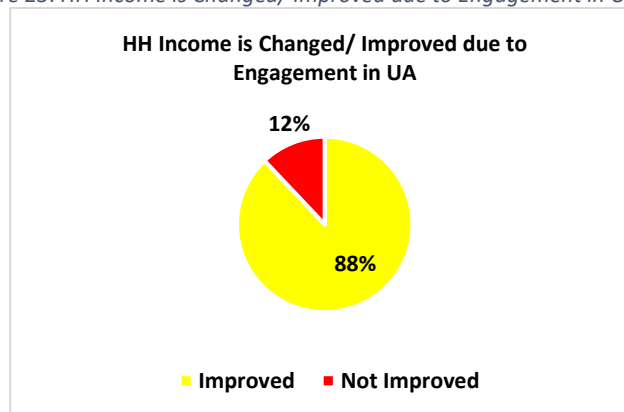
to sell their UA products is lack of production surplus. They added that the women have a significant role at sale UA products at the local markets and sometimes in front of their houses.

4.4.3 HH Income is Changed/ Improved due to Engagement in UA

Figure (25) shows that 35 of the 40 respondents (88%) improved their HHs income due to participation in UA activities, while 5 of the 40 respondents (12%) did not.

Participants in FGD stated that not all UA practitioners had surplus production to sell at local markets for additional income. They added that, however, this does not mean that these practitioners have not positively affected the reduction in the total amount of money that spend monthly to buy food.

Figure 25: HH Income is Changed/ Improved due to Engagement in UA

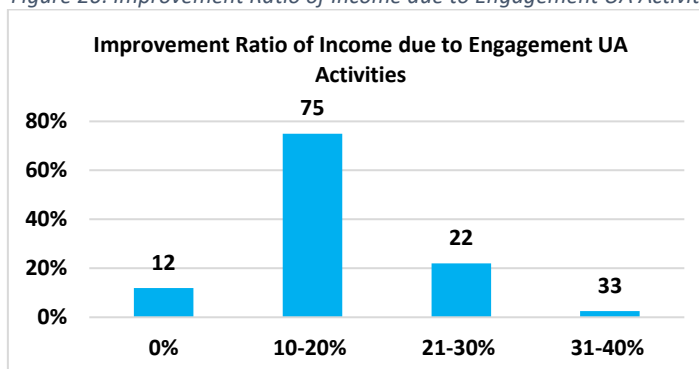


4.4.4 Improvement Ratio of Income due to Engagement UA Activities

Figure (26) shows that 5 of the 40 respondents (12%) did not improve their ratio of income due to the engagement in UA activities, 30 of the 40 respondents (75%) improved their ratio of income (from 10% - 20%), 9 of the 40 respondents (22%) improved (from 21% to 30%), 1 of the 40 respondents (3%) improved (from 31% to 40%), while there was no one improved more than 40%.

The FGD participants stated that not all UA farmers who sold their UA products at the local markets got on a lot of money. But it was slightly discrepancies between each one based on the surplus production amounts and type of products. Therefore, there is different between the improvement ratio of income for UA practitioners.

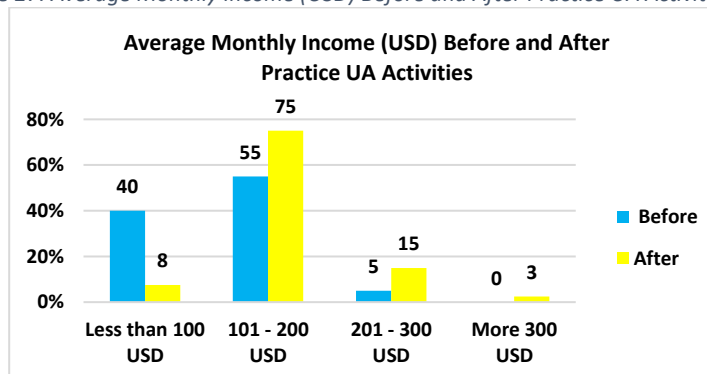
Figure 26: Improvement Ratio of Income due to Engagement UA Activities



4.4.5 Average Monthly Income (USD) Before and After Practice UA Activities

Figure (27) shows that there is a difference between the proportion of income before and after participation in UA activities. 40% of respondents had a monthly income of less than 100 USD before participating UA activities, compared to 8% of respondents after participation (This means that these people have increased their income).

Figure 27: Average Monthly Income (USD) Before and After Practice UA Activities



55% of respondents were (from 101 to 200 USD) before participation UA and increased to 75% after participation UA. 5% of respondents were (from 201 to 300 USD) before and increased to 15% after participation UA, while 0% of the respondents were more than 300 USD and increased to 3% after participation UA.

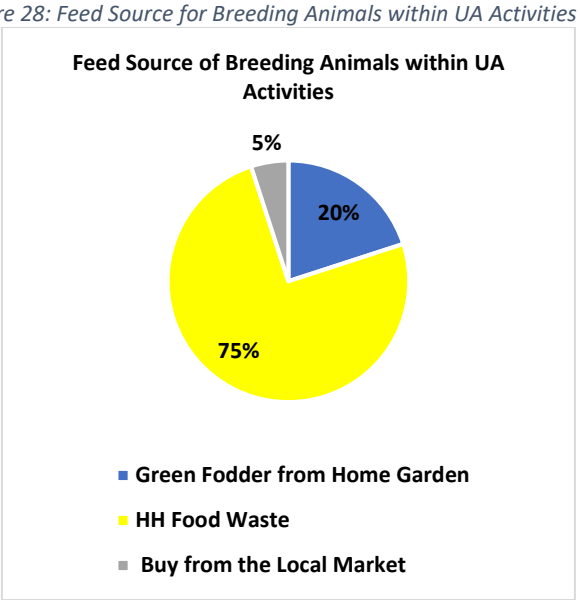
UA Expert during an interview on 4th of Aug 2019, mentioned that increase HH income, provide fresh food and get on healthy food are ones of the incentive factors that encouraged to practise UA activities by poor HH. In addition, based on GS context in term of a high rate of poverty, food insecurity, and unemployment ratio, UA is considering one of the optimal solutions that have a positive effect and effective contribution at all these challenges.

4.5 Effect of “UA Project” on the Sustainability of Using the NR at the Small-Scale Farmers HHs at Gaza City

4.5.1 Feed Source of Breeding Animals within UA Activities

Figure (28) shows that 30 of the 40 respondents (75%) use HH food/ kitchen waste to feed their animals, 8 of the 40 respondents (20%) use UA waste/green fodder, while 2 of the 40 respondents (5%) buy from the local market.

Participants in FGD and the local community leader agreed that most of HHs who are practising UA activities breeding poultry and rabbits, and those animals can eat crops waste and HH food/kitchen waste as well. In this case, breeders do not need to pay money to buy fodder. Therefore, most of HHs prefer to breed poultry and rabbits. In contrast, the respondents who breeding goat and sheep need a large amount of fodder daily and UA areas cannot provide it. Therefore, these breeders need to buy from the local market



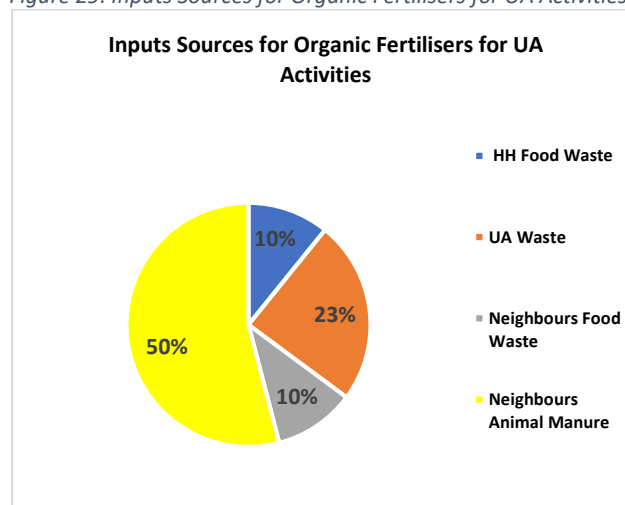
UA Expert during an interview on 4th of Aug 2019, mentioned that the HHs who use HH food/kitchen waste are contributing to keeping the environment clean and healthy, in addition, decrease the amount of waste that has a negative impact on the environment. He added that re-use food waste as fodder for animals is saving NR and keeping it more sustainable. Through a decrease amount of green fodder cultivation that needs a large amount of irrigation water and land as well.

4.5.2 Inputs Sources for Organic Fertilisers for UA Activities

The questionnaire analysis showed that 37 of the 40 respondents (92%) produce organic UA products, while 3 of the 40 respondents (8%) are not organic.

Figure (29) shows that 20 of the 40 respondents (50%) use neighbours' animal manure as a source of inputs for their organic fertiliser, 13 of the 40 respondents (32%) use UA waste as a source of inputs, 4 of the 40 respondents (10%) use neighbour's food waste as a source of input, while 4 of the 40 respondents (10%) use HH food waste as a source of input.

Figure 29: Inputs Sources for Organic Fertilisers for UA Activities



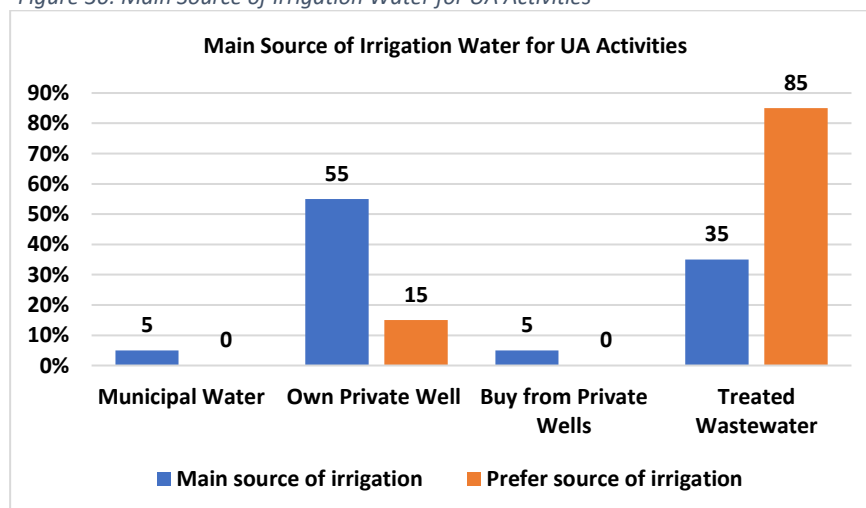
The FGD participants mentioned that most of UA practitioners prefer producing organic products due to its healthier, there is high demand at the local markets, and more profitable. They added that (most of our neighbours are breeding animals and do not have agricultural crops to use their animals' manure as organic fertiliser. Therefore, they force to throw it in the garbage. Thus, we can get this manure for free that incentive us to produce organic production).

UA Expert during an interview on 4th of Aug 2019, mentioned that using organic fertilizer in UA activities has a positive impact on sustainable use of natural resources. Firstly, protect soil and groundwater from toxic and chemical material that inside chemical fertilizer. Secondly, organic fertilizer keeps the soil more fertile by providing the soil with all requested mineral items and nitrogen that consider the most important items for soil fertility.

4.5.3 Main Source of Irrigation Water for UA Activities

Figure (30) shows that 2 of the 40 respondents (5%) of respondents use municipal water for UA crops irrigation, in contrast, there is no one prefer to use it. 22 of the 40 respondents (55%) use their own private wells, while only 6 of the 40 respondents (15%) prefer to use it. 2 of the 40 respondents (5%) buy water from private wells, while there is no one prefer it. 14 of the 40 respondents (35%) use treated wastewater, while 34 of the 40 respondents (85%) prefer to use it.

Figure 30: Main Source of Irrigation Water for UA Activities



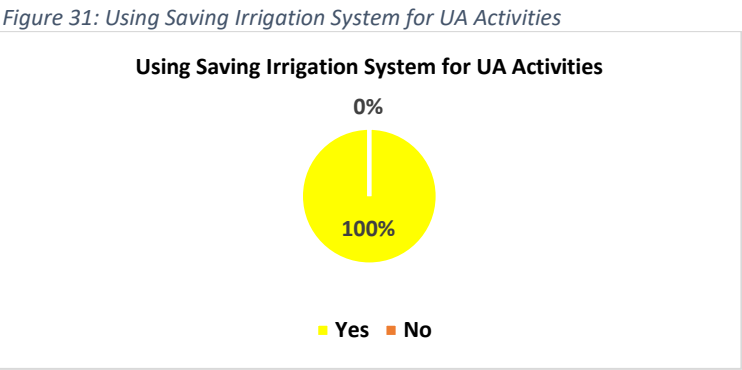
2 of the 40 respondents (5%) buy water from private wells, while there is no one prefer it. 14 of the 40 respondents (35%) use treated wastewater, while 34 of the 40 respondents (85%) prefer to use it.

FGD participants and MoA Planning Manager agreed that municipal water is expensive and not always available, and that not all UA farmers have their own wells, and if they want to buy water from private wells, it will not be affordable. In addition, they said that most UA farmers prefer to use treated wastewater for many reasons such as it is considered a rich source of minerals, nitrogen, organic fertilizers and irrigation water at the same time, very cheap compared to other irrigation sources, and it's abundant in UA areas.

UA Expert during an interview on 4th of Aug 2019, mentioned that using treated wastewater for irrigation purpose leading to the more sustainable use of natural resources. Firstly, through improving the groundwater level by keeping groundwater for domestic use and decrease of agricultural use. Secondly, using treated wastewater for UA purposes and the high demand by farmers are encouraging the government and other organisations to set up new stations to treat wastewater and re-use it with affordable price. In contrast, treating wastewater is keeping the environment clean and healthy in term of disease spread and epidemics outbreak.

4.5.4 Using Saving Irrigation System for UA Activities

Figure (31) shows that all respondents use saving irrigation systems in their UA activities. The respondents explained that some of them use a drip irrigation system and others use aquaponics system, which combines soilless vegetable farming (hydroponics) and fish farming (aquaculture) under a closed recirculation system.



MoA Planning Manager during an interview on 2nd of Aug 2019, said that the practitioners are applying the aquaponics system that consists of a hydroponic system which used by farmers through cultivating the crops without soil, and aquaculture system for fishery farms. He added that this is a comprehensive system and has many benefits such as protect crops from soil disease and sustainable use of natural resources such as water and soil. In addition, the aquaponics system provides nutrient-rich wastewater from the fish tanks, which would normally need to be changed, treated or dumped that leading to environmental problems. The wastewater is used as an organic fertilizer for plant production resulting in high-density crop production. In turn, this removes the constant need for chemical fertilizers for plant growth using the hydroponic system. Finally, he said that (we are at MoA strongly encouraging and supporting using the aquaponics system through urban and traditional agricultural activities).

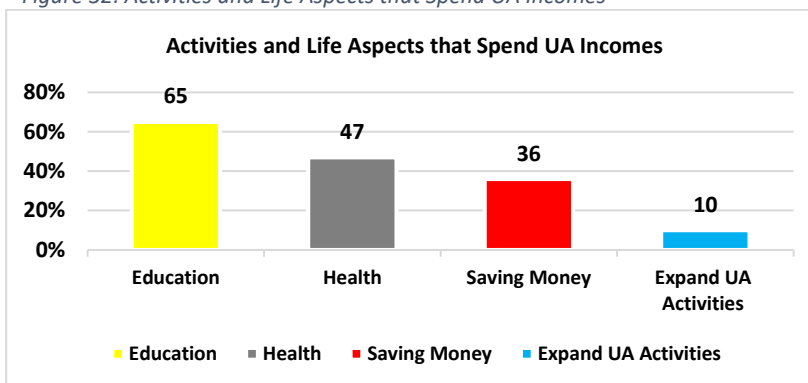
UA Expert during an interview on 4th of Aug 2019, stated that aquaponics system is so useful in term of sustainable use of natural resources. For instance, the system encourages the sustainable use of scarce resources through the recycling of nutrient-rich water from fish tanks to irrigate plants, saving 50% of water needed for normal soil farming, the system is creating zero waste, it allows removing most environmental factors impairing soil root growth (soil compaction, shortage of water, insufficient soil aeration and soil temps). Therefore, it's very environmentally friendly.

4.6 Effect of “UA Project” on the Human Capitals, Financial Capitals, and Natural Capitals at the Small-Scale Farmers HHs at Gaza City

4.6.1 Activities and Life Aspects that Spend UA Incomes

Figure (32) shows that 26 of the 40 respondents (65%) spend their UA income on education, 19 of the 40 respondents (47%) on health, 4 of the 40 respondents (10%) to expand UA activities, while 14 of the 40 respondents (36%) save money for different purposes.

Figure 32: Activities and Life Aspects that Spend UA Incomes



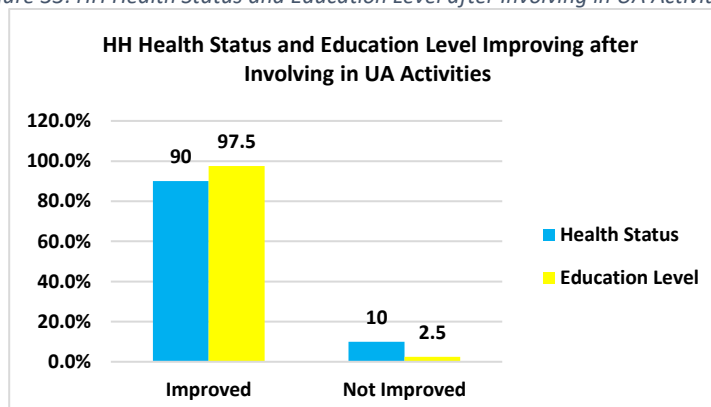
Based on FGD results, all UA farmers who engaged the UA project were not had surplus cash either to improve their health status or education level or even for saving before engagement UA project. They added that in that time the majority of UA farmers focused on providing their children with basic needs such as clothes, medicine and food. In the same time, they were lacked any opportunity to invest in education, health or saving money.

UA Expert during an interview on 4th of Aug 2019, mentioned that due to instability in the political and security situation in GS the government is unable to cover the educational and health needs of the community. Therefore, the residents are trying to meet their basic needs through UA income. In addition, FGD participants stressed that their HHs needs are very large and varied including all life aspects. Therefore, they try to meet their HHs urgent needs as much as possible to survive through buying the medicines, sending their children to school, paying education fees, and trying to expand their UA activities to produce more, sell more and get more income.

4.6.2 HH Health Status and Education Level after Involving in UA Activities

Figure 33: HH Health Status and Education Level after Involving in UA Activities

Figure (33) shows that 36 of the 40 respondents (91%) have improved their HHs members health status, 39 of the 40 respondents (97.5%) have improved their HHs members education level, while 4 of the 40 respondents (9%) have not improved their HHs members health status and only 1 of the 40 respondents (2.5%) have not improved their HHs members education level.



During FGD, the participants mentioned that the main reason behind did not improve health status and education level for some HHs who engaged in UA is the amount of UA production did meet their HHs daily needs because their HHs size is large (more than 10 individual). Therefore, there are no surplus UA products to sell at local markets and get on income to invest in education and health.

Also, the participants added that those HHs do not have extra land to cultivate and do not have extra money to rent land to expand their UA activities as well.

In addition, FGD participants added that education and health are the top priorities for all HHs in GS, all the parents are keening to send their kids to schools and their sons and daughters to universities. Where the parents believe that education will guarantee a better future for their children.

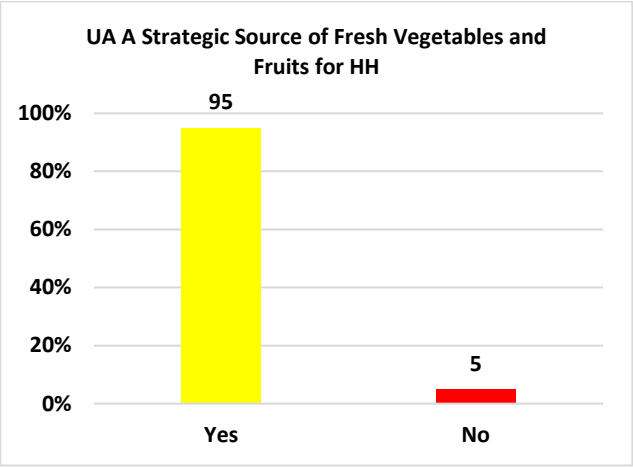
FAO Food Security Coordinator at GS during an interview on 3rd Aug 2019, stated that improving the health status of UA HHs members has a direct and positive effect on their current academic achievement that leads to improving their education level.

4.6.3 UA A Strategic Source of Fresh Vegetables and Fruits for HH

Figure (34) shows that 38 of the 40 respondents (95%) consider UA to be a strategic source of fresh vegetables and fruits at HHs level, while 2 of the 40 respondents (5%) consider UA is not a strategic source of vegetables and fresh fruit at HHs level.

FGD participants said that most of the large size HHs (more than 10 individual) cannot meet their daily needs of fresh vegetables and fruits from their UA farms. Therefore, those HHs do not consider UA as a strategic source of fresh vegetables and fruits.

Figure 34: UA A Strategic Source of Fresh Vegetables and Fruits for HH

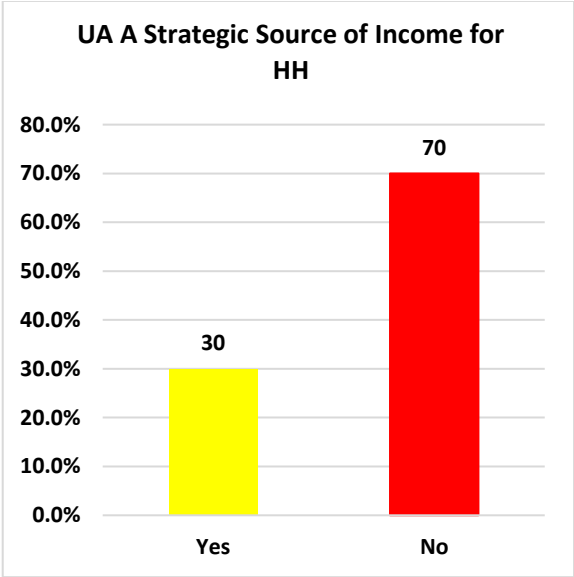


4.6.4 UA A Strategic Source of Income for HH

Figure (35) shows that 12 of the 40 respondents (30%) consider UA a strategic source of income at the HH level, while 28 of the 40 respondents (70%) consider UA is not a strategic source of income at the HH level.

UAWC director during an interview on 30th of July 2019, said that the main UA project objective is to increase fresh food availability and improve the income at the HH level for poor families. But, to consider UA as a strategic source of income for HH it should be practised as business-orientated. Through the intensive cultivating system, focusing on high-value and cash crops, and cultivating the crops that have high demand by the local market not by the HH.

Figure 35: UA A Strategic Source of Income for HH



4.7 Challenges, Difficulties and Obstacles that Effect on UA Target Groups

UAWC director and MoA Planning Manager agreed that there are many challenges and factors have an effect on UA activities in GS. For instance, the difficulty to find a large space to practice UA activities as a business. Especially in Gaza city due to the rapid urbanization pattern. In addition, GS is considering the highest populated area around the world, and Gaza city has the highest population ratio at all GS governorates.

UAWC director added that the land price in Gaza city is very high at the same time it's not easy to find a piece of land for commercial UA activities. He added that MoA and the Government lacked any type of support to encourage UA activities such as income tax exemption or free agricultural inputs tax. Moreover, they ignored the positive impacts of UA on the future environment and sustainable use of natural resources in their strategy's plans. In contrast, the UAWC director said that there is a strong interest by donors toward fund UA projects. In particular, after some of the international experts have stressed that UA is one of the main solutions to overcome the high ratio of food insecurity and poverty in GS.

MoA Planning Manager and UA Expert agreed that most farmers are well aware of UA benefits, but not all of them have good knowledge and experiences about modern and healthy practices. He added that some farmers used the untreated wastewater to irrigate their crops and untreated organic fertiliser which would certainly lead to some diseases for the consumers and land fertility. On the other hand, other farmers don't have access to water wells or treated wastewater due to lack of infrastructure and use municipal water that is very expensive and have a negative impact on domestic groundwater levels.

CHAPTER 5: DISCUSSION

This chapter discusses the research findings presented in chapter four. The research findings would be compared to the literature review and findings from the sub-research questions.

Main Outcomes

The UA project carried out by UAWC aimed at improving food security status and income of small-scale farmers. This is in line with (Smit, et al., 2001) who mentioned that one of the UA objectives is to improve food security and income for the poor people who are living in cities. Through different activities including the establishment of greenhouses, the cultivation of vegetables, fruits, herbs and keeping fish farms and the breeding of different types of animals. These objectives and activities are agreed with the definition of UA by (Drescher, et al., 2000), who stated that UA is a combination of many various activities for instance gardening, staple food production and hunting. In addition, they added that UA is not only referring to food crops and fruit trees grown in cities but also includes the raising of poultry, rabbits, goats, cheeps, and fish farms.

5.1 The Project Characteristics on Paper and What Happened in Reality.

The UA project was not implement as planned for many reasons, such as lack of funds and inability to import and provide some project inputs. This is because GS has been under siege and political division since 2007. In addition, the instability in the political and security situation is due to the daily conflict between the Palestinian and Israeli sides. This situation has led to significant restrictions on the external fund for GS projects and significant restrictions on the import of various types of raw materials from abroad. Furthermore, according to the Coordinator of Government Activities in the Territories (COGAT), there is a list of dual-use materials (used in civilian and military operations) that have prevented them from being imported into GS under the pretext of security reasons (Gisha, 2017).

Most of the respondents mentioned that NGOs made them more passionate and enthusiastic to engage UA activities through participation in the awareness and training sessions that NGOs did. However, some of them encouraged due to their own interest. In contrast, there is no one mentioned that the government encouraged him/her. This is meaning that the government lack of UA programs and don't have any project at their strategy related to support UA activities in GS as the key informants agreed.

Furthermore, UAWC director mentioned that one of UA project objective was providing target groups with intensive training and advice related to good agricultural practice in term of chemical pesticide use, sustainable use of NR and re-use organic waste either as animals fodder or organic fertiliser in order to produce high quality and healthy food. This objective is in line with a programme evaluation report of "Good Food & Urban Agriculture Program" mentioned that the program brings awareness to the importance of waste management, best practices for management of composting organic waste. In addition, applying environmentally friendly pest control efforts to avoid using potentially harmful chemicals (HCA, 2017).

5.2 Effect of "UA Project" on Food Security's Status in term of Availability at the Small-Scale Farmers HHs at Gaza City.

Research results show that there is a strong positive relationship between UA activities and food availability of the respondents. All respondents raise poultry and different varieties of vegetables and fruits and permeant tress. The reason for this is that these UA activities are providing HHs with daily food needs. These results are consistent with (Bryld, 2003), who said that most urban agriculture is carried out by the urban poor, who consume most of the product daily. He added that there is a

significant reduction in the amount of money spent monthly on the purchase of food from local markets because most of the fresh food required is available through UA production.

In addition, more than half of the respondents receive 3 meals in 24 hours after participating in UA activities, causing an increasing amount of fresh food available to enable them to eat more. This is in line with an evaluation report of the "Contribution UA in Alleviating Urban Food Insecurity at the HH Level" in Addis Ababa, Ethiopia. The report noted that participation in UA determines the positive and significant availability of food to the poor urban HHs. The report added that poor urban HHs who are engaged in UA tends to get a higher number of meals a day more than their counterparts. In addition, the report noted that HHs who are involved in UA activities are improving their food security status through improving food availability by about 50% at the HH level (Adera, 2015).

According to another evaluation report of the "Good Food and Urban Agriculture Program", about 52.7% of UA respondents indicated that they eat much more vegetables after participating in the program. Furthermore, the report added that the program helps people living in low-income communities eat healthily by improving their availability of food for fresh and affordable vegetables and fruits. In addition, more than 80% of all respondents indicated that the program helped them get fresh vegetables and fruits (HCA, 2017)

On the other hand, there is an increase in the proportion of respondents who spend 21% to 30% of their monthly income to buy food after participating in UA activities. In contrast, there is a decrease in the proportion of respondents who spend more than 40% of their monthly income to buy food after participating in UA activities. This improvement indicates a significant increase in the availability of food for HH daily consumption due to the participation of UA activities. This leads most respondents to feel food security in terms of the availability of fresh food at HH level. This result is in line with (Mougeot, 2000), who said that the most important role of the UA is the contribution to achieve the food security by improving food availability and accessibility through providing fresh vegetables, fruits, meat and eggs on a regular and stable basis.

As well as, (ETC Netherlands, 2003) report stated that urban farming can have a role in urban food security in several ways. One of them is that UA can provide immediate access to a wider number of nutritionally rich foods such as fruit, vegetables and meat. Thus, this means that the UA has positive direct effects on the practitioners through improving the HHs food security status through increasing food availability by cultivating and consuming fresh food.

5.3 Effect Of "UA Project" on the HHs Income at the Small-Scale Farmers HHs at Gaza City.

Research results show a positive relationship between increased income at the HH level and HHs who are involved at UA activities. About 30% of the respondents sell their UA products (vegetables, fruits and animals) at the local markets. Resulting in most of them improved their income from 10% to 20% monthly and about a quarter of them improved from 21% to 30% monthly as well.

In addition, there is a decreasing of HHs ratio that their average monthly income less than 100 USD, which means that there is an increase in their monthly income. By contrast, there is increase in the HHs ratio that its average monthly income rose from 101 USD to 200 USD as a result of the sale of its UA products.

Overall, more than half of the respondents stated that the sale of UA products including fresh vegetables, fruits and animals was the most important source of income at the HHs level.

These findings are in line with a report (ETC Netherlands, 2003) which stated that UA has twice positive direct effects on practitioners, the first is to improve the HHs food security status, and the second increase their income by selling fresh UA products at local markets and obtaining a new source of income that will invest in the other life aspects.

Furthermore, the results are agreed with (Bryld, 2003) who stated that UA plays an important role in improving the economic situation at the HH level. It can be a suitable source of income for the urban poor HHs through selling the fresh crops, meat, and egg at the local markets. He added that UA has an economic benefit as it is helping the poor urban farmers to use their income obtained from the farm and non-farming activities for other purposes.

The evaluation report that conducted to assess the project of “Contribution UA in Alleviating Urban Food Insecurity at the HH Level” in Addis Ababa – Ethiopia stated that HHs who engaged in farming have earned more food and cash income. In addition, UA contributes significantly and positively on increasing income (Adera, 2015).

Another evaluation report for the program of “Good Food & Urban Agriculture Program” mentioned that more than 55% of survey respondents indicated that the program was extremely helpful in terms of earning and saving money from sale UA products (HCA, 2017).

5.4 Effect of “UA Project” on the Sustainability of Using the NR at the Small-Scale Farmers HHs at Gaza City.

The research findings show that UA activities have an effect on sustainable use of natural resources. Most respondents use HH food/kitchen waste to feed their animals. Furthermore, some of them use UA waste to feed their animals as well. Other UA farmers use irrigation water and the land for UA activities such as vegetables and fruits cultivation for daily consumption rather than fodder cultivation for their animals that need wide land and so much irrigation water that they lack. This result is in line with (UNDP, 1996) report, its mentioned that UA using and re-using the natural resources and the wastes of urban areas to cultivate a diversity of crops and raising livestock.

In addition, more than half of respondent’s re-use HH food/kitchen waste and UA waste as input to make organic fertilisers that keep the soil fertility and groundwater quality. Furthermore, all respondents use saving irrigation systems through their UA activities and most of them use the aquaponics system. As well as, about one-third of respondent’s re-use treated wastewater for irrigation UA products. Also, most of them prefer using treated wastewater if it's available.

This result is agreed with (FAO, 2013) fact sheet, mentioned that UA is keeping the NR and make the cities are more sustainable through using agricultural technics such as the aquaponics system. This system is saving more than 50% of the irrigation water comparison with conventional agriculture. Furthermore, the fact sheet added that UA is using the solid wastes and the treated wastewater as organic fertilisers and avoid using chemical fertilisers that have a negative effect on soil and environment. In addition, keeping the crops protect from the diseases and creates zero waste. The fact sheet added that UA is very environmentally friendly, and UA is using the food waste of HHs either to feed the animals or produce organic fertilisers.

FAO's fact sheet added that environmental sustainability is a key issue in the frame of urban development. Therefore, UA techniques and practices are promoting and ensuring food safety and healthy environments, prevent soil erosion and protect and improve water and air quality

5.5 Effect of “UA Project” on the Human Capitals, Financial Capitals, and Natural Capitals at the Small-Scale Farmers HHs at Gaza City.

The research findings show that there is a positive relationship between UA and improved human capitals, financial capitals, and natural capitals at the HH level. More than half of respondents spend their UA income to improve their HHs education, and about half of them spend on health. Also, most of UA farmers who spend their UA income on education and health are improved their HHs education level and health status.

This result is in line with (Bryld, 2003) who stated that UA has an economic benefit as it is helping the poor urban farmers to use their income obtained from the farming activities for other purposes, such as improve their health and education level. Besides, UNDP 2016 report added that urban farming has a critical role to improve social equity by improving the health and productive capacity of poor people and by providing them with opportunities to make more income (UNDP, 1996).

Appraisal report of Urban Gardens Project in Langa, Cape Town - South Africa, agreed with the research findings. The appraisal report mentioned that the principle outcomes and benefits of participation in urban food gardens project are improved health status 56% and created employment 37% for beneficiaries (Philander & Karriem, 2016).

Furthermore, the research findings show that most of the respondents improved their income by about 20%, and most of them increased their average monthly income to about 200 USD. Also, more than one-third of the respondents used UA income for saving. In the same side, the evaluation report of the project “Good Food & Urban Agriculture Program” stated that more than half of project target groups are extremely benefited in term of saving money (HCA, 2017).

Also, a study conducted by (RUAF, 2018) mentioned that growing your food saves HH expenditures on food. Growing the relatively expensive vegetables are resulting in saving money as well as on bartering of produce. And selling produce (fresh or processed) brings in the cash for saving that has a positive and direct effect on HH financial capital.

In terms of improving the natural capital by UA activities, the research results show that most of UA farmers re-use waste food of their kitchens and UA waste as feed for their animals. Besides, half of them re-use HH food waste and UA waste to produce organic fertiliser. Furthermore, more than half of them re-use treated wastewater for irrigation and as organic fertiliser. All these activities contribute natural resources to use more effective and sustainable.

This result is agreed with the published report by RUAF 2018, stated that UA is part of the urban ecological system and can play an important role in the urban environmental management system. A growing city will produce more and more wastewater and organic wastes. For most cities, the disposal of wastes has become a serious problem. UA can help to contribute to solving such problems by turning urban wastes into a productive resource.

5.6 UA as Strategic Sources for Fresh Vegetables, Fruits and income at HHs Level.

The research findings show that most of the respondents consider UA as a strategic source for fresh vegetables, fruits, meat and eggs. In contrast, about a third of them consider UA as a strategic source of income. The respondents mentioned that to make UA business-oriented it should be made some modifications on the current model such as plant high-value crops and cash crops, also use intensive production methods.

The research findings are in line with an evaluation report of the project “Assessment of Urban Agriculture as A Livelihood Strategy for Household Food Security”, that resulting in UA has been advocated as a livelihood strategy to improve food security (Philander & Karriem, 2016).

Furthermore, (Armar-Klemesu, et al., 2000) who mentioned that UA within city limits has recently come to the forefront as a strategy to cut food insecurity among poor urban HHs in low-income states in the face of rapid urbanization and population growth.

Besides, (FAO, 2017) report added that for many urban residents, UA is considering a livelihood strategy providing food and as a main or secondary source of income.

(Smit, et al., 2001) added that self-production is an important strategy for food security improving with insufficient income. Most urban farmers are among the low-income people producing first for the consumption of the HH. In addition, improving the level of HH food security is the main goal for the poor to cultivate in cities.

5.7 Challenges, Difficulties and Obstacles that Effect on UA Target Groups

The research results show that there are high access limitations to the land due to rapid urbanization pattern in GS. Also, UA is lacking any type of support by the government such as tax exemption. This result is agreed with (Bryld, 2003), who said that UA lack of space for growing crops in cities due to the high rate of urbanization, besides, it may be not the top government priority comparison with build shelters for homeless. Therefore, some UA lack of government support or interest.

Furthermore, the research results show that there are some wrong practices by UA farmers due to lack of knowledge such as using untreated wastewater for irrigation purpose or untreated organic fertiliser that will have a negative health impact on consumers. This is agreed with (UNDP, 1996) report stated that if UA is not organized well, urban farming can be a health hazard. Also, the resources of cities such as water and urban wastes can be used harmfully for production.

The report added that the crops and livestock can be contaminated and then become health hazards to human beings due to the using of polluted rivers or wastewater and untreated compost (UNDP, 1996). In contrast, the research results show that some of UA farmers use domestic water for irrigation purpose that is very expensive and harm groundwater level caused by lack of access to treated wastewater. This result is in line with (Dorward, et al., 2013), who stated that irrigation water can be a challenge if the infrastructure is not available. There also may be concerns around the use of potable water for irrigation in terms of straining local drinking water resources and adding costs for the general tax base.

5.8 Limitations

The researcher couldn't travel to GS due to instability in political and security situations. Where he needs to get many permits from Israeli and Jordanian authorities that are very complicated processes, need so much time and there is no guarantee to get on them. Especially the Israeli permit that will prevent him to go and come back.

Hence, the questionnaires and FGD data have been collected by a hired independent consultant at GS. He has a good experience and background about urban agricultural and research process. This person selected by the researcher. Worth mentioning that, the researcher has good experience of the agricultural context at GS. He engaged about 7 years with agricultural organisations at GS. Therefore, he has good professional relationships with many of those organisations that helped him to communicate and collaborate with them to collect the requested data.

To avoid any negative effects on the research data collection processes by the hired independent consultant at GS. The researcher had close and continuing contact with the consultant in order to follow-up him case by case.

5.9 Reflection on Role as a Researcher

Introduction

In this section, I present a report reflecting on my role as a researcher during the study titled “The Role of Urban Agriculture in Times of Food Security Crisis - Case Study of Gaza City”. The report explains my experiences regarding the research process, methodology and quality of research findings.

The Research Process and Methodology

Once I selected my thesis topic, I conducted a presentation in the presence of all MoD students and other lecturers who gave me fruitful feedback and comments that helped me to modify and build a good thesis design. During the research process, I was in regular contact with my supervisor who gave me constructive feedback and criticisms. The feedback I received inspired me to new insights, creativity and innovative thinking that resulting in a strong thesis proposal.

I eventually passed the research proposal module and got the green light to proceed with fieldwork. Furthermore, I prepared drafts of the questionnaire, FGD and semi-structured interview questions and shared with my supervisor and other academia in order to examine their face validity as this is vital to designing a strong data collection tool.

Unfortunately, I was not able to travel to the GS for data collection due to political instability and security situations in Palestine as mention previously. Hence, I hired and trained a consultant with experience and background in urban agricultural and research process to conduct the Focus Group Discussion and administer the questionnaires at GS. Taking into consideration the hired consultant has done many research and studies in the agricultural and rural development sector.

The hired consultant has been selected by me to avoid any bias through data collection. Especially the thesis was an evaluation for the UA project that carried out by the organisation that I’m working for which is UAWC

The hired consultant was costly, in addition, his transportation cost during the data collection process at the field was very expensive. Because he rented a car to visit respondents who live in areas lack public transportation access. Furthermore, scanning and sending the 40 questionnaires were costly and consumed so much time and coordination.

Reflexivity of the Research

To avoid any negative effects or bias in the data collection process, I had close and continuous contact with the consultant in order to follow-up on him day by day and case by case. In order to avoid any bias by the participants, the hired consultant was asked not to inform them that this data collection was for the purpose of evaluation of the UA project that they benefited in year 2017/2018.

Sometimes, I lost contact with the hired consultant during the data collection process in the field in GS due to the bad internet connection. In the same time, I had a daily briefing call with him to discuss the daily achievements and challenges.

Since the hired consultant started to share with me the filled questionnaires as soon as they were completed, I was able to begin analysis. Once all questionnaires were completed and returned, I started sorting and entering the data in the coding sheet. The data obtained from the FGD were analyzed using content analysis and coded according to themes.

I modified the semi-structured interview questions to accommodate missing gaps based on information needed to answer the research questions. I conducted five interviews via Skype with five key informants. After analyzed all the collected data I discovered that I need additional information to answer the research questions. Therefore, I conducted another interview with UAWC director via Skype as well.

The semi-structured interviews were conducted via Skype video call and sometimes bad internet connection forced me to close the camera. Therefore, I was not able to observe the reaction and facial expression of the interviewees during the interviews. My familiarity with the agricultural context at Gaza Strip fostered a good professional relationship with many of those organizations that helped me to communicate and collaborate with them to collect the requested data.

Reliability and Validity of the Research

The data sources included both primary and secondary data. Therefore, a combination of qualitative and quantitative data has been used. Furthermore, a variety of data collection methods have been used to achieve triangulation and confirmation of the same data by different sources thereby ensuring reliability, validity and credibility of the research findings.

Regardless of the trust and high reliability with the hired consultant, I had contact with most of the research respondents who filled the questionnaire via Facebook and What App in order to ensure that the hired consultant visited them, and they filled the questionnaire by themselves without any external influence.

Putting together the report has been a strenuous task, nonetheless, I had always incorporated feedback and constructive criticism from the supervisor which I have always incorporated most of the time have been of enormous relevance.

CHAPTER 6: CONCLUSION

The purpose of this research was to evaluate the “UA Project” implemented by UAWC on the food security status, and income situation at the HH level in Gaza city. Unfortunately, UA project did not carry out as project proposal due to some restrictions included lack of fund and continuing the blockade on GS.

The research revealed that HHs participating in the UA project began their participation due to low food availability at HH level, low income and high unemployment rate. The results indicated that the role of the UA project for food security is manifested in different ways.

1. What are the project characteristics on paper and what happened in reality?

The UA project was not carried out as planned. The total planned number of beneficiaries was 150 and the actual benefited number was 100, in addition, the total number of aquaponics system units decreased from 100 to 70. There were many reasons for plan change such as lack of fund and the instability in the political and security situation due to the daily conflict between the Palestinian and Israeli sides that reflected by high restrictions on importing UA project inputs from abroad.

2. What was the effect of “Urban Agriculture Project” on food security’s status in term of availability at the small-scale farmers HHs at Gaza city?

The research found out that participation in the UA project positively determined the availability of food in the research sample. About 86% of the respondents who participated in the UA project feel food secure because of an increase in food availability. Respondents also reported a decrease in their monthly expenditure on food purchases. Furthermore, there is an increasing number of daily taking meals by HHs due to an increase in the availability of fresh vegetables, fruits and animals’ products that requested for daily HHs consumption.

3. What was the effect of “Urban Agriculture Project” on the HHs income at the small-scale farmers HHs at Gaza city?

The research showed that participation in the UA project positively determines the situation of income in the research sample. There is an improvement in the income situation for 88% of HHs that participated in the UA project by selling their products at the local markets, resulting in increased HHs average monthly income. Furthermore, UA is considering one of the most important sources of income at the HH level.

4. What is the effect of “Urban Agriculture Project” on the sustainability of using the natural resources at the small-scale farmers HHs at Gaza city?

The research showed that participation in the UA project positively identified the sustainable use of NR in the research sample. All respondents are re-using food/kitchen and UA wastes and treated wastewater that has a negative impact on the environment as inputs for their UA activities such as feeding their animals and produce organic fertiliser that keeping the NR using more sustainable.

5. What has been the effect of “Urban Agriculture Project” on the human capitals, financial capitals, and natural capitals at the small-scale farmers HHs at Gaza city?

The research found out that participation in the UA project positively determines the impact of UA on human capitals, financial capitals and natural capitals in the research sample. Increasing the income of UA farmers has a positive impact on their education level and health status as top priorities at the HH level. Also, saving money for different purposes as a result of an increase in their income as well. Furthermore, UA is re-using different types of organic wastes as inputs for UA activities.

In addition, the research showed that 95% of respondents can be considered UA a strategic source of fresh food and 30% of respondents can be considered a fairly strategic source of income at the HH level.

Finally, the research found out that UA has many challenges such as access to land and irrigation water. Also, there are wrong practices by UA farmers due to lack of knowledge that can lead to health hazards to human beings. On the other hand, UA lacks government support and does not include its strategic plans.

Based on the results of the study, it can be concluded that there is a positive effect of the UA project on food security status and income situation at the HH level in Gaza city.

CHAPTER 7: RECOMMENDATIONS

The research concludes that UA project is contributing to overcome some main challenges that GS suffering on such as the high ratio of food insecurity and unemployment, bad economic situation and low income, lack of sustainable use of natural resources such as domestic water and access to land, in addition, rapid urbanization pattern.

On this basis, it is recommended UAWC to modify their strategic plans, projects and policies for the next 3 years toward development agriculture sector in GS. Through adopting UA as a top intervention and solution priority that will give overcome some of GS challenges. Taking into consideration that the donors are so interested to support UA projects in GS.

The research also found that most of the respondents cultivate vegetables and fruits and some of them lack knowledge about modern UA practises and technology. Hence it is recommended to UAWC providing UA farmers within the next 3 years strategic plan with technical advice, high-quality extension services and practical training related to using modern agricultural technology such as aquaponics systems, especially for vegetables and fruits UA farmers.

Another main conclusion of the research is that some of respondent's lack of knowledge about re-using treated wastewater and organic fertilisers in the proper way, in addition, lack of marketing skills for their UA products. Hence it is recommended to UAWC providing practical training in term of good and modern agricultural practices related to re-using treated wastewater and make of organic fertilisers, post-harvest practices and marketing skills to strengthen the capacity building of urban farmers.

Finally, UAWC advised that UA farmers be provided with regular advice in term of the type of crops that can be grown to meet their daily HH consumption needs, improve their dietary diversity and meet the market needs as well. In addition, raise UA farmers awareness about the requested regular maintenance for aquaponic systems in term of spare parts and the cost in order to keep their projects more sustainable.

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APPENDICES

RESEARCH QUESTIONNAIRE

THE ROLE OF URBAN AGRICULTURE IN TIMES OF FOOD SECURITY CRISIS

CASE STUDY OF GAZA CITY

The research aims to assess the effects of urban agriculture activities on the food security situation in terms of the availability of fresh vegetables and fruits for daily household consumption. In addition, the impact on the income of small farmers at the HH level in Gaza City (GS). In order to make recommendations to decision-makers to modify their investment strategy and orientation.

Section A: General Information for Head of Household

1- Gender:

☐ Male ☐ Female

2- Age:

☐ Under 20 ☐ 21-30 ☐ 31-40 ☐ over 41

3- Level of education:

☐ Illiterate ☐ Primary ☐ Secondary ☐ Tertiary ☐ other

4- Household size:

5- Type of house:

☐ Concrete building ☐ Asbestos ☐ Steel ☐ Tent ☐ Other.....

6- Area of the used land for UA (Hectare)

7- Land ownership

☐ Private ☐ Rented land ☐ Both ☐ Other

Section B: Information about Urban Agriculture and Food Security

8- What is the most important source of income?

☐ Selling from (UA) agriculture produce ☐ Selling (UA) animal produce ☐ Own business ☐ Fisher ☐ Depends on Charity or Relatives ☐ Other

9- Average monthly income (USD) before practice UA activities

10- Average monthly income (USD) after practice UA activities?

11- How much you spend monthly on buying food (%) before practice UA activities?

☐ Less than 20 ☐ 21-30 ☐ 31-40 ☐ more than 40

12- How much you spend monthly on buying food (%) after practice UA activities?

☐ Less than 20 ☐ 21-30 ☐ 31-40 ☐ more than 40

13- What is the majority type of food you buy after involving in UA activities?

.....

14- What are activities or life aspects that spend UA incomes? You can select more than one.

☐ Education ☐ Health ☐ Saving Money ☐ Expand UA Activities ☐ Other

15- Did the HH health status improve after involving in UA activities? And why?

☐ Yes ☐ No

Why:

16- Did the HH education level improve after involving in UA activities? And why?

☐ Yes ☐ No

Why:

17- Did the HH income change/ improve due to your engagement in UA?

☐ Yes ☐ No

18- If “yes” to question (17), can you give information about the improvement rate of income that you obtained from the UA activities only?

☐ 10-20% ☐ 21-30% ☐ 31-40% ☐ More than 40% ☐ Does not Know

19- Did you get on any types of assistance as HH to start-up UA activities?

☐ Yes ☐ No

20- If “yes” to question (19), which type of assistance did you receive?

☐ Cash ☐ In-Kind such as

21- If “yes” to question (19), did this assistance has an effect on your income level?

☐ Yes ☐ No

22- Do you sell any of the UA products at the local markets?

☐ Yes ☐ No

23- If “yes” to question (22), why?

.....

24- If “yes” to question (22), who is selling the product at the local markets?

.....

25- Type of activities of UA practised by the HH (you can choose more than one)

☐ Poultry ☐ Dairy ☐ Agriculture Crops ☐ Fishery Farm
☐ Other

26 Type of agriculture crops

☐ Permanent Trees ☐ Vegetables and Fruits ☐ Fodder ☐ Other

27- Do your HH using the UA products for daily consumption?

☐ Yes ☐ No

28- Which type of UA products do HH use mostly on a daily basis?

☐ Vegetables ☐ Fruits ☐ Milk ☐ Egg ☐ Meat ☐ Other

29- When did you start to engage in UA?

Please determine the year

30- Who encouraged you to engage in UA? (you can choose more than one)

☐ Own Interest ☐ Governmental Support ☐ NGO/ INGO ☐ UN ☐ Other

31- Are you feeling food secured in term of availability (the requested daily amount of fresh food is available for HH) due to engagement in UA?

☐ Food Secure ☐ To Some Extent ☐ Food Insecure ☐ Varies from One Year to Another ☐ Other

32- If “food secure” to the above question, what is/ are the reason/s?

☐ Increased food availability of HH
☐ Diversified source of income
☐ Increased income of HH
☐ Job opportunity
☐ Other

33- if “food insecure” to question (32), the reason is: (you can choose more than one)

☐ Lack of production
☐ Lack of input/ seeds for planting
☐ Low market demand
☐ Threat of pollution
☐ Pesticide/ herbicide usage
☐ Other

34- How many meals did your HH have in 24 hours before practising UA?

☐ 1 Meal ☐ 2 Meals ☐ 3 Meals ☐ 4 Meals ☐ Other.....

35- How many meals did your HH have in 24 hours after practising UA?

☐ 1 Meal ☐ 2 Meals ☐ 3 Meals ☐ 4 Meals ☐ Other.....

36- Have you faced any difficulties in meeting your HH’s food needs during your engagement in UA?

☐ Rarely ☐ Sometimes ☐ Often ☐ No answer

37- If you are breeding any types of animals, what is the feed source for them? (you can choose more than one)

☐ Green Fodder/UA waste from Home Garden ☐ HH Food Waste ☐ Buy
from The Local Market ☐ Other.....

38- Is your UA production organic (did not use any chemical pesticide or fertilisers)?

☐ Yes ☐ No

39- If “yes” to question (38), what are the inputs of organic fertilisers? (you can choose more than one).

☐ Food Waste ☐ UA Waste ☐ Neighbours Food Waste ☐ Others.....

40- What is the main source of irrigation water for UA activities?

- ☐ Municipal Water ☐ Private Well ☐ Buy from Private Wells
☐ Treated Wastewater ☐ Others.....

41- What is the source of irrigation water for UA activities that you prefer? And why?

- ☐ Municipal Water ☐ Private Well ☐ Buy from Private Wells
☐ Treated Wastewater ☐ Others.....

Why?.....

42- Do you use saving irrigation system for UA activities?

- ☐ Yes ☐ No

43- If “yes” to question (42), please explain?

.....

44- Is UA a strategic source of income for your HH?

- ☐ Yes ☐ No

45- Is UA a strategic source of fresh vegetables and fruits for your HH?

- ☐ Yes ☐ No

SEMI-STRUCTURE INTERVIEW QUESTIONS

- 1- Please provide the name of the institution and your positions?
- 2- Type of Institute: international NGO – CBO – Governmental – UN - private?
- 3- What the project activities were in reality?
- 4- What the project activities were in the proposal?
- 5- What were the selection criteria of the target group?
- 6- Which food security pillars (availability, economic and physical accessibility, utilisation and stability) UA can contribute? And how?
- 7- What is the relation between UA and food security in term of food availability (provide fresh vegetables and fruits for daily consumption)?
- 8- What kind of support do you provide to the UA practitioners?
- 9- What exactly the role of your institution toward supporting UA? Please choose from the following: (provide fertilizer - provide seeds and pesticides – cash support - knowledge, training) Please mention if other.
- 10- What are the factors that may affect on UA in Gaza?
- 11- Are donors interested in supporting the UA project through in Gaza? Why?
- 12- Do you think that the Gazan HHs women playing important role in UA activities? Please explain?
- 13- In your opinion, what motivates HHs to engage in UA? Please choose from the following: (food availability - Job opportunities – more income – healthy food – sustainable using of NR) Please mention if other.
- 14- What difficulties or obstacles do you encounter as UA target groups? Please choose from the following: (lack of governmental support – lack of community awareness about UA importance – lack of donors interesting in UA – the frequent Israeli aggression on the agricultural lands – the rapid urbanization pattern) Please mention if other.
- 15- Does UA encourage sustainable natural resources using in term of irrigation water? Please explain?
- 16- Does UA have a role of re-using food waste? Please explain?
- 17- Have you seen changes in food consumption, income, human capital, natural capital, the financial capital of participating households? Please explain what kind of changes (for better or worse) and indicate what caused these changes. Applies to all participating households or a specific group?

FGD QUESTIONS

- 1- What is your experience of involving UA activities?
- 2- What are the challenges that facing you during UA practising?
- 3- What are the benefits of involving UA activities in term of availability of fresh vegetables and fruits and income at the HH level?
- 4- How much you spend on buying food (%) out of your total income before and after involving in UA?
- 5- What are the activities that spend UA incomes? (improve HH education level and improve HH health status, saving and new investment, using new technology to keep natural recourse more sustainable) please explain?
- 6- Did the HH income change/ improve due to your engagement in UA? Please explain?
- 7- Do you sell any of the UA products at the local markets? and why?
- 8- Do your HH using the UA products for daily consumption? Please explain?
- 9- Are you feeling food secured in term of providing the daily fresh food due to engagement in UA? Please explain?
- 10- Can you consider UA as a sustainable livelihood strategy in term of more income and provide fresh vegetables and fruits for your HH? Why?

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Date: **11 September 2019**

Name of Student: **Nezar Mahmmoud Nassar**

E-mail address: **eng_nezar2009@windowlive.com**

Theme/Study: **MSc Management of Development (Food and Nutrition Security)**