

UNIVERSITY OF CAPE COAST

EFFECTS OF PERI-URBAN AGRICULTURE ON URBAN POVERTY
REDUCTION IN THE SEKONDI TAKORADI METROPOLIS

FREDERICK ABEIKU ARTHUR

2016

UNIVERSITY OF CAPE COAST

EFFECTS OF PERI-URBAN AGRICULTURE ON URBAN POVERTY
REDUCTION IN THE SEKONDI TAKORADI METROPOLIS

BY

FREDERICK ABEIKU ARTHUR

THESIS SUBMITTED TO THE DEPARTMENT OF GEOGRAPHY AND
REGIONAL PLANNING OF THE FACULTY SOCIAL SCIENCES, OF THE
COLLEGE OF HUMANITIES AND LEGAL STUDIES, UNIVERSITY OF
CAPE COAST IN PARTIAL FULFILMENT OF THE REQUIREMENTS
FOR THE AWARD OF MASTER OF PHILOSOPHY DEGREE IN
GEOGRAPHY AND REGIONAL PLANNING

APRIL, 2016

DECLARATION

Candidate's declaration

I hereby declare that this thesis is the result of my own original work and that no part of it has been presented for any other degree in this university or elsewhere.

Name: Frederick Abeiku Arthur

Candidate's signature: Date.....

Supervisors' declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of dissertations as laid down by the University of Cape Coast.

Name: Assoc. Prof. Kwabena Barima Antwi

Principal supervisor's signature..... Date.....

Name: Dr.Comfort Adetona

Co-supervisor's signature..... Date.....

ABSTRACT

Agriculture, which is the main source of livelihood of peri-urban dwellers in Sekondi-Takoradi Metropolis is seriously being threatened by rapid urbanization due to the discovery of oil in the Tano Basin. The oil industry is gradually impacting the urban development pattern of the twin city. Hence peri-urban agriculture has been limited to areas such as riverbanks, roadsides, parks and lands under high-voltage electrical towers that cannot be used for buildings.

The main thrust of this research was to assess how peri-urban agriculture can be integrated into the economy of Sekondi-Takoradi Metropolis. A triangulation of both quantitative and qualitative methods was used in order to give the research statistical and conceptual significance.

The research result demonstrates that peri-urban agriculture is an important feature of the urban and peri-urban land use system. Peri-urban agriculture makes important contribution to employment, income and food supply. The urban economies can greatly benefit from urban agriculture, if all the Metropolitan/Municipal/District Assemblies can develop a policy and institutional framework on the sector.

It is therefore clear from the study that adoption of policies by Planners is key to the realization of peri-urban food security and sustainable city development. In order to realize the full potential of peri-urban agriculture, there is the need to develop a policy and institutional framework for the sector. This would enable urban farmers unlock critical technical and financial support services.

ACKNOWLEDGEMENTS

I owe a debt of gratitude to all the people who have made this thesis possible. First and foremost, I thank my Principal supervisor, Associate Prof. Kwabena Barima Antwiand Co-supervisor, Dr. Comfort Adetonafor their time, guidance, patience and most importantly their fruitful comments without which this venture would not have been possible. I thank Miss Belinda Achiaa Akoto, Mr Harrison Nti-Appiah, Ms Tracy Acquaye, Mr Osman Adams and Mr Gerrard Atampugre, Miss Paulina Okyere for their motivational messages and technical assistance in this study.

I also thank the peri-urban farmers of Sekondi-Takoradi, the Geographic Information Systems and Cartography Section of the Department of Geography, UCC for cooperating with me on this project.

Lastly I would like to specifically express my sincere gratitude to field assistants Daneil Deklu, Sampson Botwe and Stella Eli Kornu for their help in collecting information about respondents for this study.

DEDICATION

To my Parents- George and Paulina

TABLE OF CONTENTS

Content	page
DECLARATION	ii
ABSTRACT	iii
ACKNOWLEDGEMENT	iv
DEDICATION	v
TABLE OF CONTENTS	vi
LIST OF TABLES	x
LIST OF FIGURES	xi
LIST OF PLATES	xii
CHAPTER ONE: INTRODUCTION	1
Background to the study	1
Problem statement	5
Research questions	6
Objectives of the study	7
Significance of the study	7
Organisation of the study	8
CHAPTER TWO: REVIEW OF RELATED LITERATURE	9
Introduction	9
Conceptualizing urbanization	9
Urbanization in Ghana	10
Definition of peri-urban and peri-urban agriculture	12

Characteristics of peri-urban areas	15
History of peri-urban agriculture in Ghana	29
Importance of peri-urban agriculture	32
Problems and constraints of peri-urban agriculture	39
Approaches to promoting peri-urban agriculture	41
Studies on integration peri-urban agriculture into sustainable city development	46
Conceptual framework	53
CHAPTER THREE: METHODOLOGY	58
Introduction	58
Profile of study area	58
Justification of selecting the study area	62
Research design	63
Sample size determination and sampling methods	64
Data collection instruments	65
Data processing and analysis	68
Reliability, validity and trustworthiness	69
Ethical issues and limitations	71
CHAPTER FOUR: RESULTS, ANALYSIS AND DISCUSSION	72
Introduction	72

Characteristics of respondents	72
Socio-demographic distribution of respondents (farmers)	74
Employment and occupational profile of farmers	76
Peri-urban agriculture as a livelihood strategy	79
Peri-urban Agriculture farming characteristics	80
Challenges facing peri-urban agriculture practices	81
Locating peri-urban agriculture activities	89
Institutions and policies influencing peri-urban agriculture	91
Institutional analysis	94
Understanding planning institutions, policy and decision making process	97
Understanding spatial land use planning practices	98
Recognizing and permitting peri-urban agriculture	99
CHAPTER FIVE: SUMMARY, CONCLUSIONS AND	100
RECOMMENDATIONS	
Introduction	100
Summary of Research process	100
Main findings of the study	100
Conclusions	104
Recommendations	105
Research limitations and areas for further research	108
REFERENCES	110

APPENDIXES	125
1. Town and country planning department institutional interview guide	125
2. Metropolitan Assembly institutional interview guide	130
3. MOFA institutional interview guide	134
4. Interview schedule for peri-urban farmers	137

LIST OF TABLES

Table		page
1	Types of crops grown under urban and peri-urban area	20
2	Classification of organic waste materials	38
3	Data collection, analysis and validation methods used	70
4	Age and sex structure of peri-urban farmers	73
5	Marital status of peri-urban farmers	74
6	Educational levels attained	75
7	Distribution of migrants according to their source region	76
8	Source of farm input	88
9	Farmers response to access to credit service	89
10	Characteristics of farm size and area in STMA	91
11	Institutions involved in UPA in STMA	92

LIST OF FIGURES

Figure		page
1	Spatial extent of peri-urban areas	13
2	Conceptual framework for understanding peri-urban agriculture as a tool for household food security	33
3	Conceptual framework	57
4	Study Area in regional and national context	59
5	Main source of employment	77
6	Occupational characteristics	78
7	Monthly income of respondents	79
8	Major constraints facing peri-urban agriculture in STMA	82
9	Water accessibility issues	84
10	Sources of water for cultivation	85
11	Access to improved seeds, fertilizers and pesticides	87
12	Locating peri-urban agriculture in STMA	89

LIST OF PLATES

Plate		page
1	Farming along the airstrip	83
2	Using contaminated water to irrigate farm lands	85
3	Untreated waste water used in watering farm lands	86
4	Traditional way of harvesting rainwater for irrigation	86
5	Satellite image showing the biggest peri-urban agriculture farm around the Takoradi airport	90

CHAPTER ONE

INTRODUCTION

Background to the study

A remarkable trait of the 21st century has been the high rate of urbanization which has characterized the growth and development of cities. History has indicated that no country in the industrial age has ever achieved significant socio-economic development without urbanization (Ebert, 2000). This shows the close association between economic development and urbanization. It has been estimated (De Boeck, Cassiman & Van Wolputte 2009) that between 2007 and 2050, the world population is projected to increase from 6.7 billion to 9.2 billion, and most of this growth will occur in urban areas of less developed countries (De Boeck, Cassiman, & Van Wolpu, 2009). Virtually all of the 2.5 billion increase will occur in the developing world's urban areas (UN-HABITAT, 2010).

Central to the urbanization phenomena are qualitative and quantitative changes in urban food demand. According to Food and Agriculture Organization (2008), recognition of the importance of Urban and Peri-urban Agriculture (UPA) leads to food security and sustainable livelihood. Peri-urban farming, which is originated about 800 million years ago has contributed significantly to food security and food safety globally (Olima, 2003). The practice has sustained livelihoods of the urban and peri-urban low-income dwellers in developing countries for many years (Durand-Lasserve, 2003). Peri-urban agriculture's popularity among the low-income urban

dwellers is largely due to lack of formal jobs and as a means of supplementing household incomes (Adam, 2014).

However, increasing urbanization coupled with weak management and governance of peri-urban lands for agriculture and irresponsible consumption patterns, have led to food shortages and rising prices lately (Rostow, 2004). Food security in urban areas where more than half of the world population lives is one of the greatest challenges of our time (Alterman, 2007). Although sufficient arable land is still available for agriculture practices at a global level, land is a scarce resource in the urban and peri-urban environment where it is threatened by informal growth (Hogrewe, Joyce & Perez, 2003). Institutional aspects of agricultural production within the cities and conservation of land and existing agricultural production in its peri-urban areas are often neglected by statutory codes and urban development policies.

While planners are of the view that, integration of urban and peri-urban agriculture into city development could resolve these problems, the integration process has been of great challenge, especially for Less Economically Developed Countries (LECD), which is usually characterised by weak institutional framework (Müller-Jökel, 2004). More comprehensive approach however, is adopted by most European countries where peri-urban agriculture has been fairly integrated in city management (Mutiarra, 2008). The development of 'functional urban regions' (Deelstra & Girardet, 2004) and the creation of the European Spatial Development Perspective (ESDP), - 'territorial cohesion' has become key concepts for counter-balancing this trend, promoting a harmonized development of peri-urban agriculture across regions (Heilig, 2002). This process includes the integration of peri-urban

areas into the urban system, the connection of neighbouring cities to form polycentric networks and the formation of large-scale metropolitan regions (Deelstra & Girardet, 2004).

On the other end of the spectrum, growth in urban centers and functional role of peri-urban areas in less economically developed countries are extremely unevenly distributed, consequently integration of the two areas is not strategically planned (Foster, Briceño-Garmendia, World Bank, & Africa Infrastructure Country Diagnostic, 2010). Currently the concentration of economic and population development in such areas are found in large urban areas which is expanding at a faster rate, hence converting agriculture lands in peri-urban centers into residential and industrial land use (Foster et al, 2010).

According to Garland (2008), integration of peri-urban agriculture into city management to ensure conservation of lands has largely failed in Africa because urban planners and city managers fail to take into account suburbanization, decentralization, and development of sub-centers, greater flexibility of location, improvements in technology and transportation and the effectiveness of central and local government policies (Egziabher, 1994). Hence, peri-urban areas have become the preferred places for housing, industrial and commercial development due to the relatively cheaper land values (UN-HABITAT, 2010).

Ghanaian cities are not isolated from this worldwide phenomenon. According to Farvacque-Vitkovic, Raghunath, Eghoff and Boakye (2008), 65 percent of Ghana's population will be living in urban areas by 2030. The 2010 Population and Housing Census of Ghana indicate that the proportion of urban population in Ghana increased from 43.8 percent in 2000 to 50.9 percent in

2010 (Ghana Statistical Service, 2010). Consequently, the number of urban localities in Ghana is expected to increase, however, cities like Accra, Kumasi and Sekondi-Takoradi host over 40 percent of the urban population. Between 1984 and 2000, the growth rate of Accra was 3.4 percent while that of Kumasi was 5.6 percent (Ghana Statistical Service, 2010). It presupposes that rural populations and those of smaller towns are reducing with direct consequences on the major cities.

This high rate of urbanization has accelerated the demand for land to meet the increasing needs of urban dwellers particularly, in the major cities in Ghana (National Development Planning Commission, 2005). As a result, there is seemingly unregulated rapid expansion of peri-urban areas where basic facilities such as piped water, electricity and sewage services are virtually non-existent (Ghana Shared Growth and Development Agenda, 2010). The unregulated patterns of development in these areas have given rise to complex organic urban and peri-urban growth, which predominantly expands horizontally.

As a consequence, the peri-urban centers are experiencing intensive and continuous development in an uncontrolled manner. Prime agricultural lands in these areas have been utilized for physical development purposes. The uncontrolled pattern of physical development poses challenges on peri-urban agriculture. As stated by Sharp, Imerman and Peters (2007), peri-urban agriculture cannot be considered in isolation, instead, they are part of a regional, national or even wider economic framework and thus their management cannot be done remotely. Instead, a more holistic approach is required to integrate peri-urban agriculture into the wider economy of regions

and the nation as a whole.

Statement of the problem

Agriculture, which is the main source of livelihood of peri-urban dwellers in Sekondi-Takoradi Metropolis is seriously being threatened by rapid urbanization (Attua & Fisher, 2011). The discovery of oil in the Tano Basin immediately has brought an astronomical increase in interest in Sekondi-Takoradi Metropolitan Assembly (STMA), solidifying its position as the third largest urban center in Ghana (Cooperative Housing Foundation International, 2011). According to the Ghana Shared Growth and Development Agenda (2010), the oil industry is gradually impacting the urban development pattern of the twin city. Thus, the allocation of agricultural land for residential development has resulted in a reduction in the quantity (size) and quality of land. Hence peri-urban agriculture has been limited to areas such as riverbanks, roadsides, parks, lands under high-voltage electrical towers that cannot be used for buildings (Ghana Shared Growth and Development Agenda, 2010).

Though in recent times the STMA had recorded some level of achievement in managing the city's growth through the establishment of Urban Poverty Reduction Project (UPRP), Sekondi-Takoradi Citywide Slum Upgrading Fund (STMA-CSUF), Ghana Urban Management Pilot Project (GUMPP), Cooperative Housing Foundation International (CHFI) initiatives and the Sister-City Programme, there is still rapid decline in the existing agriculture land and an increasingly limited access to the natural resources on which the livelihoods of the poorest depend.

Policies are needed to protect farming in these peri-urban areas, land rights and agricultural livelihoods of the poor since a large number of the youth are also opting out of farming because of growing insecurity in land ownership (Yeboah & Obeng-Odoom, 2010). The loss of agricultural land to rapid urbanization has become possible because of the high rate of natural population increase and migration of people to STMA. The peri-urban farmer is the most affected in all of these developments since their source of livelihood is dependent on agriculture. Despite its importance as a major food supplier, employment generation and its relevance in sustaining livelihood for the urban poor and for environmental management, peri-urban agricultural practice seems less integrated in land use planning processes and structures (Yeboah & Obeng-Odoom, 2010). How to adequately integrate this rapidly expanding urban population and maintain the urban environment in order to satisfy urban food demand is a challenge. This issue recognized thus far raises key questions that have to be empirically investigated.

Research questions

The study thus endeavoured to answer the following questions:

1. Where are peri-urban agriculture lands located within the STMA?
2. What are the problems encountered by practitioners of peri-urban agriculture in the metropolis?
3. How significant is peri-urban agriculture in supporting the emerging oil economy of the metropolis?
4. How can peri-urban agriculture be used to improve sustainable livelihoods within the metropolis?

5. What are the existing policies and interventions employed by city and urban planners in promoting peri-urban agriculture?

Objectives of the study

The general objective of this research was to assess how peri-urban agriculture can be integrated into the economy of Sekondi-Takoradi Metropolis. Specifically, the study sought to:

1. Develop a map of peri-urban agriculture lands within the STMA.
2. Analyze problems encountered in practicing peri-urban agriculture in the metropolis;
3. Describe the significance of peri-urban agriculture in supporting the emerging oil economy of the metropolis;
4. Assess how peri-urban agriculture is being used to improve sustainable livelihoods within the metropolis; and
5. Examine existing policies and interventions employed by city and urban planners in promoting peri-urban agriculture.

Significance of study

First the study outcome will contribute to knowledge and literature on peri-urban agricultural lands in Sekondi-Takoradi. Secondly, the results of the study would be useful in future studies on peri-urban agriculture and therefore may serve as a source of reference to academics, researchers and students interested in the subject matter. The output of the study will also inform city authorities and planners regarding current police and institutional arrangement towards integrating peri-urban agriculture practices into urban planning. More

importantly the map to be generated would give city managers an insight in improving sustainable peri-urban agriculture.

Organization of study

The study is structured into five main chapters. The first chapter looks at the background information and the statement of the problem. It examines the nature, causes, effects and the extent of the problem and outlines the questions the study sought to answer and the objectives to be achieved, as well as the significance of the study.

The second chapter reviews related literature from various sources and provides the theoretical orientation of the thesis. Chapter three describes the range of research methods that was used to conduct the study, including profile of the study area, research design, sampling techniques, data sources and means of analysis and presentation of data.

Chapter four presents the results and discussion of data collected from the field while the final chapter presents a summary of findings, conclusions and the recommendations of the thesis, as well as areas for future research.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

In order to get a strong basis for analysis of data, this chapter reviewed literature from various sources on the concept of urbanization and peri-urban agriculture. This would give informed decision on how peri-urban agriculture can be integrated into sustainable city development. The chapter also provides further insight into the issue of urbanization and food security and how urban planners and managers can help to integrate them to ensuring sustainable cities feeding themselves.

Conceptualizing urbanization

The UN Habitat (2006, p28), defined urbanization as the outcome of social, economic and political developments that lead to urban concentration and growth of cities, changes in land use and transformation from rural to metropolitan pattern of organization and transformation. Similarly, Nsiah-Gyabaah (2000) also defined urbanization as the shift from a rural population to an urban population and includes an increase in the number of people in the urban areas. From the above definitions, it is clear that urbanization is the concentration of people at a particular geographical area. Thus, for the purposes of this study, urbanization would be defined as the concentration of

population from the rural area to the urban area.

According to the World Bank Development Report (2000), urbanization is regarded as inter-sectorial phenomenon involving all aspects of the human society and economy (World Bank, 2000). In effect, urbanization affects all spheres of human life both in the rural and urban setting.

Urbanization in Ghana

According to UNFPA (2007), the population of Ghana has grown steadily since 1921 when the first formal population census was conducted. Most of the increases occurred in urban centers. From as low of about 9 percent in 1921, the proportion of the total population in urban areas almost tripled to reach 23 percent in 1960, and more than doubled to reach 49 percent in 2007 (GSS, 2000a). There has been a gradual percentage increase of the number of people living in urban areas from 1948 to date as well as their corresponding total populations. Whereas only 9.4 percent of the total population lived in urban areas in 1931, this population shifted to 13.9 percent in 1948, 23 percent in 1960, 28.9 percent in 1970, 31.3 percent in 1984 and 53.4 percent in 2010 (GSS, 2007). In sum, by 2010, the number of urban settlement had increased about nine folds from 41 in 1948 to 364 in 2000 and 543 in 2010 while the corresponding population increased almost fifteen times from 570,597 persons in 1948 to 8,278,636 in 2000 (GSS, 2000b & GSS, 2007).

Factors promoting urbanization in Ghana has been rural urban migration, natural increases in cities, and re-classification. Villages grow into towns once they have attained the threshold population of 5000 or more

persons which is the census definition of an urban center in Ghana (GSS, 2007). Between the periods of 1948 to 1960, about 98percent of the urban growth was caused by migration from rural areas (Songsore, 2000). The increase in urban populations did not decline that of the rural areas. Rural population increased from 5 million in 1960 to 6 million in 1970 reaching almost 8.4 million in 1984 (GSS, 2007). The rate of increase in the urban population was however faster than that of the rural population.

The population of Ghana is also growing very fast. According to the 2010 population census, it stands at 24 million; representing a 63.8 percent increase on the 12.3 million recorded 16 years earlier in 1984. However, this is lower than the rate for West Africa (2.9 percent), but higher than the global rate (1.5 percent) and gives a population density for the entire country of 79.3 people per square kilometer.

Urbanisation is concentrated in the Greater Accra, Ashanti, Western and Northern Regions where the rate of change in tenure and livelihood in peri-urban areas of the major cities in Ghana are changing at an alarming rate. The inter-censal growth rate in peri-urban areas of the capital Accra is 4.4percent per annum, compared with the national growth rate of 2.7percent (Yeboah & Obeng-Odoom, 2010). The 2010 population census indicate that more than half of the population of Ghana is expected to live in urban centers. Which means conversion of subsistence agricultural holdings into housing estates, industrial estates, infrastructure, schools, offices, shops, recreational grounds and other related land uses. The monetary and related benefits and potential opportunities in the urbanization process and changing land use patterns (i.e. from subsistence to commercial land markets) are not in dispute (Yeboah &

Obeng-Odoom, 2010). What has been the issue is the implication of rapid urbanization and the emerging land markets for sustainable development in the peri-urban communities in the light of agriculture.

Definition of peri-urban and peri-urban agriculture

The term 'peri-urban' has many different meanings and there seems to be no single satisfactory definition for 'peri-urban interface' and different definitions are understood to apply in different circumstances and regions (Mbibaa & Huchzermeyerb, 2002). The definitions may even change in the same location over time as a city expands; for example, as a medium-sized city becomes a large one, the spatial extent of the peri-urban zone also changes (Rakodi, 1998). As the spatial extent of peri-urban zone is closely related to the growth and expansion of a city, it is often difficult to delineate a permanent peri-urban boundary. It is continuously shifting outward from the city (Adell, 1999). At the same time, the composition and interests of the socio-economic groups in the peri-urban areas tend to change over time (Narain & Nischal, 2007).

With the intention of clarifying the nature of the peri-urban areas, and to avoid confusion, it is useful at the outset to present basic characteristics and views of what 'peri-urban' is. The word '*peri-urban*' could be used to denote a place, concept or process (Narain & Nischal, 2007). As a place, it can refer to rural agricultural areas located between urban built-up areas in cities and predominantly rural agricultural areas (Figure 1). As a concept, peri-urban could be seen as an interface between rural and urban activities and institutions where rural and urban development processes meet, mix and interact on the edge of cities. As a process, it could be thought of as the two-

way flow of goods and services between rural and urban.

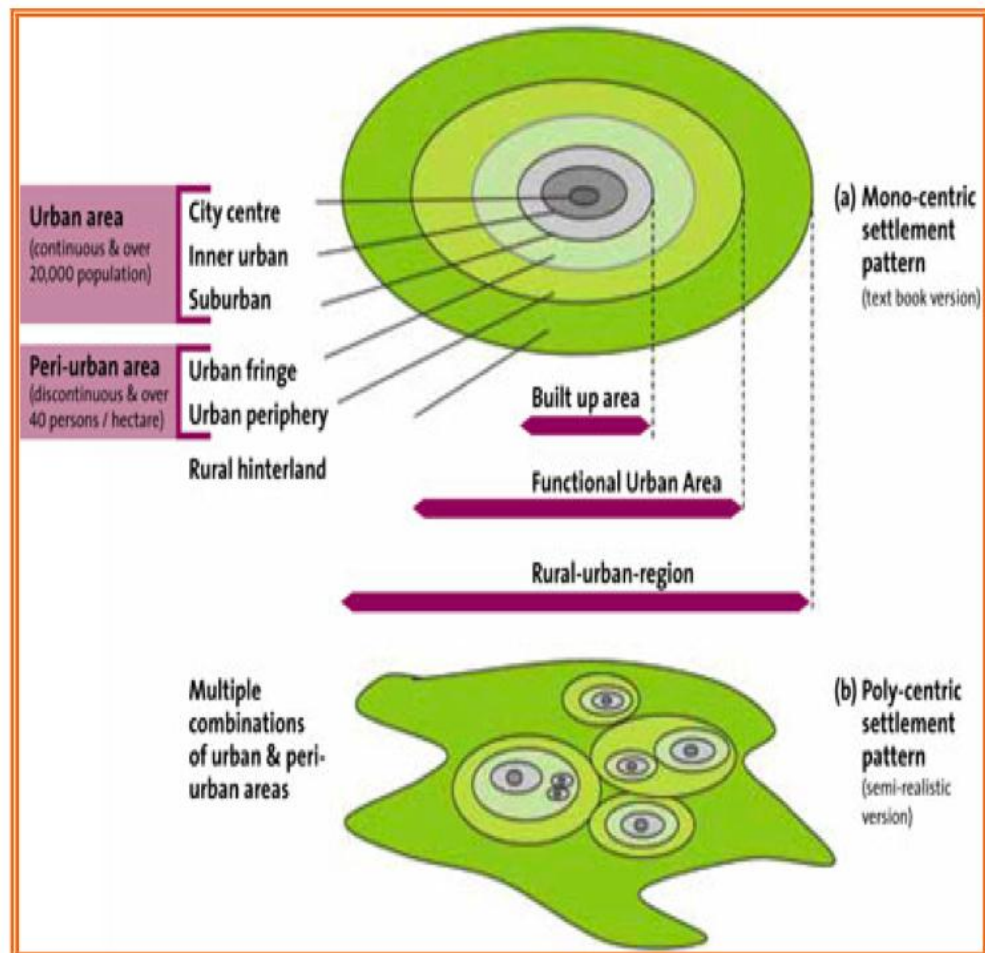


Figure 1: Spatial extent of peri-urban areas

Source: Narain and Nischal (2007)

Moreover, from the institutional point of view, it is difficult to establish clear and more or less permanent institutional arrangements that deal effectively with the peri-urban land (Narain & Nischal, 2007). As a result, peri-urban areas are often characterized by converging and overlapping institutions and there are also some administrative activities which may fall outside the purview of rural and urban jurisdictions. As a result, the peri-urban zone encompasses a range of activities lying between strictly urban or rural jurisdictions, without falling clearly within the responsibility of either the

urban or the rural government. Consequently, peri-urban dwellers are confronted with both urban and rural laws and institutions, breeding a situation of legal pluralism. For instance, in many African countries, statutory and customary laws co-exist and whereby both formal and informal land market transactions are equally important (Tacoli, 2002).

Peri-urban agriculture, the most popular definition accepted by United Nations Framework Convention on Climate Change (UNFCCC) and Intergovernmental Panel on Climate Change (IPCC) and developed by Mougeot (2000), “an industry located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of food and non-food products, (re-) using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services largely to that urban area”(Mougeot, 2000).

Tefera (2010), defined peri-urban agriculture as the growing of plants and raising of animals for food and other uses within and around cities – characterized by closeness to markets, high competition for land, limited space, use of urban resources, low degree of farmer organization, mainly perishable products. In study of urban agriculture in East Africa by Egziabher (1994) they defined peri-urban agriculture as “the growing of food crops and fruit trees; raising of animals, poultry, fish, bees, rabbits, snakes, guinea pigs, crocodiles, rats or other stock considered edible locally. Smit and Nasr (1992) in their study of impacts assessment of urban and peri-urban agriculture defines peri-urban agriculture as encompassing the production of food and non-food plants and animal husbandry both within and in the peri-urban areas.

From the definitions above, the various authors tend to affirm that peri-urban agriculture is in the boundaries of towns and cities providing supplementary role to those in the main agriculture sector. In this study however, peri-urban agriculture is adopted to mean the practice of producing agriculture produce within cities environments for household consumption as well as for sale to the urban population.

Characteristics of peri-urban areas

According to Organization for Economic Co-operation and Development (OECD, 2007) the term 'peri-urban' came into public domain and use during the 1980s in Europe. The OECD described peri-urban as a name given to the 'grey area', which is neither entirely urban nor rural in the traditional sense. It is neither fully urbanized nor completely rural, but often seen as a 'middle band' of land with atypical characteristics (Buxton, 2007). It comprises an unbalanced mixture of urban and rural functions. Peri-urban area serves as the zone where urban-rural interaction is at its peak. At this zone, rural activities and modes of life are in rapid retreat, with extensive urban land use intrusion. That is urban area physically and functionally expands into the rural area.

Peri-urban areas exhibit peculiar characteristics that make them distinct from urban and rural areas, and these include accelerated development of urban residential and urban commercial uses, and decrease in rural primary activities (Hewitt, 1989), rapid but unplanned growth with inadequate service infrastructure (Government of Swaziland, 1997), middle and low income residents (Johnson, 1974), and serve as receptacles for the growing rental

market (Buxton, 2007).

Peri-urban areas can be classified into four interrelated categories, namely; village peri-urban, diffused peri-urban, in-place peri-urban and absorbed peri-urban. The categorization is derived from the underlying socio-demographic processes, especially migration. The defining features connected the elements of the typology in the form of a continuum.

Location and scale of peri-urban agriculture

About the location and scale, the best-know international urban agriculture agencies RUAF Foundation indicates the locational feature of peri-urban agriculture on its website as: inside the cities (intra-urban) or in the peri-urban areas, may take place on the homestead (on-plot) or on land away from the residence (off-plot), on private land (owned or leased) or on public land (parks, conservation areas, along roads, streams and railways), or semi-public land (schoolyards, grounds of schools and hospitals) (retrieved from <http://www.ruaf.org/topics/urban-aquaculture> on 30/11/14).

The small-scale urban agriculture is prevailing phenomenon in most countries, both developed or developing, and play an important role in supplying food for household and ecological system conservation. Mougeot (2000) argues that the most important distinguishing character is not the location but the integration in and impact on urban system, the location characteristic is a great advantage to the process where sufficient inputs, techniques are closed to the perishable products, like fresh vegetables, fruits, meat and milk. Bon, Parrot and Moustier (2010) presented that the concept of urban agriculture involves two parts urban and rural at same time, but the definition of what constitute then very important and vary from region to

region. Thus, location is not just a geographic factor but a context that will link to peri-urban agriculture. When defining the location character, researchers combine the city planning with real situation and indicate peri-urban agriculture is located outside the urban center but integrated in and have impacts in urban context (Yang, 2011).

Activities and stages of peri-urban agriculture

Baumgartner and Belevi (2001), suggest that the following activities have to be included:

- a) acquisition and utilization of the necessary resources, inputs and services;
- b) production of goods;
- c) “post-production”, including processing, packaging, distribution, marketing, and recycling; and
- d) consumption.

However, they defined a broader range of peri-urban agriculture activities, while in most of literatures, the most commonly activity is production, then the other activities which directly links to deal with their productions can be thought as peri-urban agriculture practices.

Peri-urban agriculture stakeholders

The emerging and developing of peri-urban agriculture is largely practitioner-led. Reviewing the processes, those involved are: the providers of resources, the providers of services; producers, the distributors, consumers, the promoters of activity and the administrators (Baumgartner & Belevi 2001). These players, in turn, are in both formal and informal economy. Then the

number of people engaged in urban and peri-urban agriculture is much higher than if only urban farmer are counted.

Different income level can take part in peri-urban agriculture. Some studies indicate that in the household level, the main producer is women but some argue that the main producers are men and women are always mainly focus on the market activities. Women also are considered as the most active and predominant participant in urban and peri-urban agriculture (Kutiwa, Boon, & Devuy, 2010). Some researchers indicates that the urban farmers are not possible to be the migrants since it is difficult for them to get access to urban land water and other productive resources. However, with the expansion of urban areas, the initial rural area is becoming more urban and the scattered urban centers make some cultivated land embedded in big urban agriculture concept. It creates more opportunities for migrants to obtain resources and practicing peri-urban agriculture.

Motivation for engaging in peri-urban agriculture

In industrialized countries, on one hand, due to the continuous development of social-economic situation, the drawbacks of highly urbanization are increasing significantly. People begin to realize the value of multi-functional agriculture. On the other hand, as income increases, people have more time and requirements for urban environment on leisure in terms of culture, education and entertainment (Kutiwa, Boon, & Devuy, 2010). In this case, urban agriculture comes into being, which is considered as a necessary component of sustainable urban development, to improve living environment, benefit human beings and increase biodiversity. Nevertheless, it always acts as

an informal tool for urban low-income groups to provide necessary food and enhance their livelihoods in developing countries (Adesina, 2007).

In most developing countries, the driver factor that push urban household grow food in their backyard, for example, in most African cities, peri-urban agriculture as a strategy to cope with the food insecurity (Drakakis-Smith, Bowyer-Bower & Tevera, 1995). Peri-urban agriculture is providing not only food but also jobs, and hope in Nairobi, Kampala, Dakar, Kumasi and other cities across sub-Saharan Africa. In Asian countries, the emerging of peri-urban agriculture mainly links to the increasing urban population (Nugent, 2000) and urbanization which result in population growth in cities while the hysteric job market creates unemployment and food insecurity.

Urban household needs to seek other means to increase income and mitigate poverty, and thus revert to agriculture. Both of these explain the contexts in which urban agriculture emerges and develops (Narain & Nischal, 2007). Increasing urban poverty and dependence on food banks led many community organizations in Canada and the United States to develop intensive peri-urban agriculture projects aimed at increasing food security and creating jobs for low income households.

In US, community support agriculture was prosperous in the urban periphery in order to provide safe food and contributed to community health as well as the local connection between people, economy and landscape (Schnell, 2007). Peri-urban agriculture is prone to Change concerning to forms or purposes, like allotment system, once the important form of peri-urban agriculture in Britain is the strategy to coping with the food insecurity (Gerrard, 2010).

Types of crops cultivated

According to Doan and Oduro (2011), the crops that are grown by peri-urban farmers in West Africa are vegetables and cereals. Urban and peri-urban farmers supply over 80 percent of vegetables such as spring onions and lettuce consumed in many cities. For example, 20,000 people who patronize restaurant and street food in Accra consume food items in other products from urban and peri-urban farmers (Olima, 2003). Attua and Fisher (2011) also stated that there is “silent revolution” in production, processing and marketing of high valued perishable commodities. For example fruits, vegetables, meat, eggs and fish are occurring much of these in the peri-urban areas. In Ghana, peri-urban crop farming comprises of two forms: (i) open-space production for the urban market, and (ii) backyard gardens cultivated mostly, but not only, for home consumption.

Table1: Types of crops grown under urban and peri-urban area

Farming systems	Urban areas	Peri-urban areas
Market production (cultivation on undeveloped urban land)	Irrigated vegetables (year round or seasonal), flowers and ornamentals; rain-fed cereals	Irrigated vegetables (mostly seasonal), fruits; rain-fed cereals
Subsistence production (cultivation at the house)	Backyard or front yard farming	Home gardens, farming around home

Source: Drechsel (2006)

Weed control

Several residual herbicides are available for the control of annual weeds. Depending on the weed spectrum, Atrazine, Diuron, Simazine used alone or in mixture are very effective if applied as the first seedlings appear and the ground remains clean for 2-3 months. Also, the farmers use cutlasses and hoe to clear the land before planting as well as weeding the farms. The farmers need to use protective clothing for weeding but due to financial constraints they do not have them and many get injured in the process (Payen, 2007).

Disease and pest control

There are a number of pests and disease that affect crops on the field especially vegetables and fruits. Some of these are heart rot and top rot which affects fruit (caused by fungal infection) and wilt (caused by insects, nematodes and mealy bugs). The common pests associated with fruits and vegetables are mealy bugs, scale insects among others (Jaquinta & Drescher, 2000). Administration of appropriate chemical supplements with good practices is the control measure for the pests and disease (Masakazu, 2003). The farmers do not have an idea of how these pest and disease in their farms. The wilt disease for instance is caused by mealy bugs. Mealy bugs can be controlled by drenching of plants by insecticides like Dimethoate, Durban and Diazinon regularly. Suspected plants are uprooted and destroyed (Bon, Parrot & Moustier, 2010). Nematodes are found in all types of soil and they cause stunting of the crops unless soil is fumigated. Crop rotation is also an effective

control. Treatment of nematodes should be done just after planting and a second treatment 3-4 months after planting (Jaquinta & Drescher, 2000).

Soil structure

Soil structure related to the grouping and arrangement of soil particles. It describes the gross overall combination or arrangement of the primary soil separate into secondary grouping called aggregate or peds. When protected under dense vegetation and undisrupted by tillage, most soil (except perhaps some sparsely vegetated soil in arid regions) possesses a surface structure sufficiently stable to allow rapid infiltration of water and to prevent crusting (Adam, 2014). However, for the manager of cultivated soils, the development and maintenance of stable soil structure is a major challenge. While any tillage tends to hasten the loss of organic stabilizers, tillage, which the soil is too wet mechanically, breaks down aggregate so that individual particles tend to act independently, filling in the macropores and creating puddle condition (Baumgartner & Belevi, 2001). In this condition, the soil is nearly impervious to air and water. Wet soils as in irrigation areas are also more susceptible to compaction.

Clayey soils are especially prone to puddling and compaction because of their high plasticity and cohesion. When these soils are dry, they usually become dense and hard. On the other hand, if a clayey soil which is too dry is tilled large hard clods are turn up, which is difficult to work with into good seed beds. Tillage must be timed carefully with to soil moisture content. Proper timing is more difficult for clayey than for sandy soil because, the

former takes much longer to dry to suitable moisture content and may also become too dry to work easily (Michael, 1978).

Sources of water

Rainwater is the major source of water used by the peri urban farmers in farming; in the absence of the rainwater they use clean water for irrigation when available, but pipe borne water for irrigation is rare due the cost involved and its unreliability of supply or lack of access (Baumgartner & Belevi, 2001). Since access to and suitable water a major challenge for peri urban farmers, peri urban farmers resort to using waste water for irrigating their crops and feeding livestock. They use tis waste water due to variety of motives. One the major reason is that it is often the only source of water available and available all year-round and it is also inexpensive. Sources of waste water include surface run-off, city drainage, city drainage canal, sewage, grey water or black water and drainage channels, as well as hospital and industrial waste water (Anikwe & Nwobodo, 2002).

Using waste water in peri-urban agriculture is a key mechanism for sustainable management of water supporting saving for domestic purposes. Estimate shows that out of potential 42.7 million cubic waste water produced in Accra only 0.36 million cubic meters (0.84percent) and 1.3 million cubic meters (3.04%) of untreated water are used in peri urban agriculture during the wet and dry season respectively (Baumgartner & Belevi, 2001). However, the use of waste water in agriculture is often negatively perceived by the public and by government official, this could also have negative impact on the public health and the environment as well.

Influence of climatic conditions on peri urban agriculture

Baumgartner and Belevi (2001) stated that, high temperatures combined with low relative humidity can seriously affect fruit setting and both higher and lower temperature can affect fruit quality. It further been noted that, high temperatures of about 16 degree Celsius are considered most adequate for cultivars. According to Dutta (2012), very hot weather in the tropics with low sunshine incident on high night temperatures results in excessive vegetation growth at the expense of fruiting. It also leads to increase in diseases. Crush, Hovorka and Daniel (2010). also observed that, there is a dense growth during cold, dew and foggy nights and these slightly impaired vegetable crops especially tomatoes and this slightly impaired reproductive growth.

However, it is not economically prudent to grow a vegetable crop outside its climatic range. The major climatic factors are temperature, light and rainfall. West Africa falls within the tropics and hence the temperature is generally hot but lower in higher altitude areas, temperatures lower.

Harvesting

Most farmers delay in harvesting their produce intentional so that the vegetables may grow but this ends in deterioration of the harvested produce. Thus tomatoes and other fruits over ripe, snap beans get stringy, cucumbers bitter and so on. After harvesting the produce is often not handled with care. Also no provision is made in the containers to prevent damage. Such injuries do not only lower the quality of the produce but also, cut short its shelf life.

The delay can be remedied when the crops are harvested on time (Dutta, 2012).

Post-harvest storage

The produces are highly perishable and therefore it is essential to transfer them to the markets quickly as possible. Ordinarily, apart from few supermarkets no cold storage facilities exist for vegetables produce. This practice lowers the production of small growers since they depend largely on immediate sale of their produce (Dutta, 2012). The growers can procure these storage facilities when they form themselves into cooperative unions. This will enable them to embark on more production of vegetable crops. This could also be solved by establishment of marketing agencies which will purchase at the production centres (Crush, Hovorka & Daniel, 2010).

Sources of credit for peri urban agriculture

Most farmers operate on small scale due to lack of funding. However, credits are available at the Agriculture Development and the National Investment Bank as well as other Commercial Banks. These banks demand an adequate security to be produced before granting of credit and since most growers lack these securities, they could not access the credit. However, the banks have been advising them to form cooperative unions so that they could have easy access to the credits (Dutta, 2012).

Extension services

One cannot rule out the role of extension services in efficient production of fruits and vegetables. Agriculture extension services have a key

role in any drive toward increased production and productivity. The systems are units that have first line contact with the primary producers. The extension systems operate in an effort to solve problems and concerns of farmers. The system ensures better prospect of farming ventures (Dutta, 2012). However, extension officers lack transportation facilities to efficiently reach farmers. Various modes of transportation to reach farmers include walking, use of bicycles and motorcycles. Further, transportation requirements depend on the size of the area, the number of farmers to be served and the availability as well as the roads. How to get from one farm to the next is a worldwide problem of extension system (Crush, Hovorka & Daniel, 2010). Hence most farmers in the rural communities do not have access to new research findings on the efficient techniques of production and innovation information.

Tools, equipment and machines

The tools, equipment and machines required depends on whether the system is intensive or extensive, if cultivations are mechanized or not and on capital availability. The tools normally used by one are spade, trowel, rake, cutlass, hoe, shovel, watering can garden line etc. For machines and equipment, a tractor implement can only be justified if the cropping area is four hectares and more. It is not economic to tie up capital in expensive machinery unless it will be used for life, and it must not be on a smaller than four hectares. It is advisable to start small scale with manual labour (Dutta, 2012).

Marketing of farm produce

Many farmers sell their produce at the farm gate and at the local markets. In this price control is determined by local supply and demand. Marketing beyond the village level immediately brings to play a variety of factors. These are transportation, marketing, organisation and processing capacity. Other factors are for instance if the crop is for export, the ability to transport and deliver them in satisfactory conditions (Alterman, 2007).

Buxton (2007) observed that market women and other intermediaries provide internal marketing services. The marketing chain is short but marketing costs are high. These costs are as a result of poor roads, inadequate transport and lack of credit facilities and the knowledge of supply. Inadequate marketing systems can severely influence the small holders when their produce does not sell at reasonable price. If market is insufficient, there may be little incentive to invest in improved technology. Farmers inability to market their produce efficiently hinders attempt to improve their income (Crush, Hovorka, & Daniel, 2010).

Gender issues in peri-urban farming

Gender issues in agricultural production have become an important subject of investigation, ever since questions were raised on whether women and men benefit equally from economic development. It has been observed that women are under-nourished, under- educated, over- worked, under-paid and hence poorer than their male partners, as 70% of the 1.3 billion people living on a dollar a day are women (United Nations Development Programme, 2002). It was emphasized during the development of the Millennium Goals (MDG's) in 2000, that although women are largely engaged in many sectors

of the economy, a major concern is the fact that they are less than men when it comes to productive jobs even under condition of freedom and equity.

Open-space irrigated urban vegetable farming in Ghana is a predominantly male-oriented activity. On average, less than 10% of all urban open-space farmers were women and many of them cultivated indigenous vegetables, not exotic ones (Obuobie, Keraita, Danso, Amoah, Cofie, Raschid-Sally, & Drechsel, 2006). In contrast to farming, women dominate vegetable marketing, especially the retail of leafy vegetables. This concurs with earlier findings in Ghana (Obuobie, Drechsel, Danso & Rashid-Sally (2004), but is not representative for all sub regional countries. In general, more than a half of the open-space farmers are married and occasionally involve their wives in the marketing of produce. Studies done in many cities in Africa, particularly in South and East Africa indicate that most “urban farmers” are women. Examples include Kenya, Mozambique, Tanzania, Uganda, Zambia and Zimbabwe. This is because women continue to bear primary responsibility for household sustenance and well-being (Chancellor, 2004), or because of their lower access to education than men, thus, they have fewer opportunities of finding suitable waged employment in the formal sector (Obosu-Mensah 1999).

Cross-generational and cultural integration

Peri-urban agriculture is also a way to promote cultural and cross-generational integration. There are several peri-urban farm and community garden projects that allow immigrants to cultivate food to sell and consume (Balmer, Gill, Miller, Peterason, Rhoads, Rosenbloom & Wall, 2005). Since

many immigrants have substantial experience in agriculture, these programs allow them to use their existing skill set to grow and sell produce and provide food access to immigrant families and communities. Urban agriculture gave immigrants an opportunity to share their cultural varieties of vegetables and fruits with neighbourhood markets.

This not only helped them network with other immigrants but also created shared opportunities with non-immigrant residents (Krasny & Doyle, 2002; Beckie & Bogdan 2010). There were also examples of cross-generation sharing between youth and seniors. Since the majority of community gardeners are seniors (Teig, Amulya, Bardwell, Buchenau, Marshall, & Litt, 2009), these gardens are an ideal venue for seniors to pass on knowledge and work with youth. Gardens also created opportunities for seniors to socialize and revisit skills learned during their childhood. These garden spaces sometimes helped seniors transitioning from home ownership adjust to senior homes and more high-density living (Beckie & Bogdan 2010).

History of peri-urban agriculture in Ghana

In Ghana peri-urban agriculture dates back to the arrival of the Europeans when vegetables were grown in gardens created around the castles and forts along Gold Coast from the 16th century onwards (Anyane, 1963). Currently, an appreciable number of perishables vegetables consumed in Ghana's cities are also produced in and around peri-urban areas. More than 200,000 urban dwellers eat exotic vegetables daily on Accra's streets and in canteens and restaurants (Obuobie, Keraita, Danso, Amoah, Cofie, Raschid-Sally, & Drechsel, 2006). According to Obuobie et al (2006) most of the

perishable vegetables are produced in open spaces in the cities or its fringes due to insufficient cold transport and storage

British colonial administrators, while promoting urban vegetable cultivation in Ghana's urban areas, permitted neither the rearing of livestock and poultry nor the cultivation of indigenous food crops. In fact, Afrane, Klinkenberg, Drechsel, Owusu-Daaku, Garms, and Kruppa (2004) revealed that Europeans introduced vegetable cultivation into Ghana. Exotic vegetables and ornamental crops from Europe were purposely grown to feed the European settlers and to beautify their residences; the cultivation of vegetables was confined to the residences of European civil servants and merchants and the castles and forts which served as both the seat of government and the homes of the colonial administrators.

The period between the two World Wars saw an upsurge in vegetable farming in Accra and in other cities along the West African coast. The colonial government encouraged city residents to grow vegetables to meet the demand of the allied forces stationed in the Gold Coast led to a decline in vegetable farming; nevertheless it continued after independence in 1957.

Officials of various Town and City councils were instructed to destroy any crops growing in the city, as well as and animals found roaming the street, and the farmers responsible were prosecuted for compromising with city health. The "*tankaase*" (health inspector) who insured compliance was often very ruthless-one of the most feared city officials in the municipal establishment and in some instances was known to have the culprits whipped before dragging them to court (Asomani- Boateng,2002).

From 1972 to 1976, official responses to urban farming took a dramatic turn when the government began to tolerate farming in cities and towns in Ghana (Anyane, 1963). This change in official attitude was brought about through a combination of factors. This was a period of harsh economic conditions, resulting from the devaluation of the Ghanaian currency, huge external debts and, later, drought. A major consequence was that supplying food for the country's population became national issue. Food shortages, coupled with the exorbitant prices of food items, especially in cities and towns became innumerable (Danso, Keraitia&Afrane, 2002).

A major event that worsened the food crisis was the National Redemption Council's (N.R.C) government policy to repudiate all foreign loans and contracts-in what became known as the Yentua Policy (We shall not Pay). Under this policy, the ruling government at that time refused to pay all outstanding foreign loans, nor would they honour foreign contracts that had been entered into by previous governments (Obuobie et al, 2006).

The international community responded with a credit boycott and other forms of aid to Ghana. Food import, which had always been a major component of the country's food supply, was seriously curtailed. Drought conditions prevailed in the country, resulting in poor harvests. The impact of this isolation on the country's food supply was immense. To respond to Ghana's food problem, the government launched the Operation Feed Yourself program (Hansen, 1987).

It was a crash program aimed at increasing both food production and promoting national self-reliance by encouraging Ghanaians in rural as well as urban areas to grow their own food. Though peri-urban agriculture was not

specifically mentioned, this program had a spill over effect on urban farming. Peri-urban farming activities were tolerated and stringent regulations and bylaws that curtailed peri-urban agriculture were relaxed. It gave urban residents the opportunity to farm without fear of their crops and animals being destroyed by city officials. Urban residents were encouraged to farm on any available space in the Ghanaian cities in order to increase food supply (Asomani-Boateng, 2002).

Today, peri urban farming has come to stay, but not without a hitch. There are some consequences on peri-urban livelihoods. It is not uncommon to see either a large small track of farmlands of some major cities of Ghana (Accra, Tema, Kumasi, Sekondi -Takrodi etc.) being transformed into other use (especially, for construction). There has been competition for land in the peri-urban areas both for residential use and for farming. Though urbanization creates opportunities in wage employment and trading for people in peri-urban areas and provides them with some access to services and infrastructure, it usually comes with intense competition for land, population pressure and pollution and health hazards-all of which pose serious challenges to people's livelihoods and in turn, policy makers and implementers.

Importance of peri-urban agriculture

The benefits that peri-urban agriculture brings along to cities that implement these practices are numerous. The transformation of cities from only consumers of food to generators of agriculture products contributes to sustainability, improved health and poverty alleviation (Buxton, 2007). Peri-urban agriculture has always not just provided food production but also plays

other roles in the economy, society and ecology which help to mitigate some of the key challenges in our modern society including global warming, rapid population growth, international and domestic food insecurity as well as urban waste management (Bon, Parrot & Moustier, 2010). The following are some of the benefits of peri-urban agriculture.

Food security

Food security has been recognized as a major benefit of practicing peri-urban agriculture as it contributes to urban food self-sufficiency and nutrition by helping to provide all citizens with increased access to nutritious foods and reduce their food expenses which results in food security.

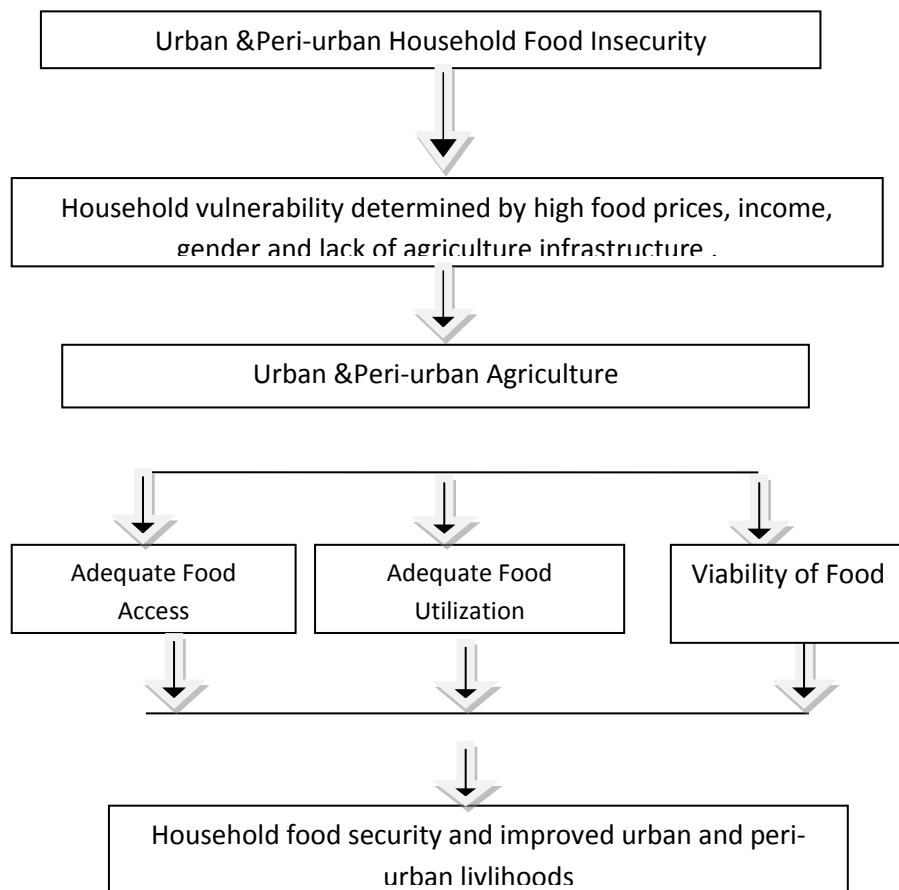


Figure 2: Conceptual framework for understanding peri-urban agriculture as a tool for household food security.

Source: Kutiwa, et al. (2010)

Kutiwa et al. (2010) indicate that urban and peri-urban agriculture is one way to escape the food insecurity and poverty cycle in a cash intensive environment and develop a conceptual model to address three components of food security. Households involved in urban and peri-urban agriculture can produce their own food and get immediately the fresh product for consumption. The money saved from the supplement of food make household get access to dietary diversity. The food utilization refers to the nutritional security in terms of food quality. Additionally, the major products in urban and peri-urban are fresh and perishable products such as vegetables, fruits, eggs and milk.

The relatively large number of studies that took many cities as specific cases that have looked at the link between urban agriculture and food security and indicate that there is indeed an impact of urban and peri-urban agriculture on child nutritional status, household per capita dietary energy requirement, food access and quality and reduces prices (Armar-Klemesu, 2000; Crush, Hovorka, & Daniel, 2010). For example in many Asian countries, they have a long history of practicing urban and peri-urban agriculture with a great diversity of products to overcome the conflicts between big populations and limit arable land. As an example, many cities in China are able to be self-reliant in non-grain foods. Singapore is 25 percent self-reliant in vegetables and 100 percent in meat (Hubbard & Onumah, 2001). The collapse of socialist

bloc in Cuba in the late 1980s accounted for 85 percent of Cuba's trade in economic slump made Cuba agriculture face challenges to provide food but to the locally-available resources (Tefera, 2010). But potential food safety risks may be higher for peri-urban agriculture production than those in rural areas because urban environment are more polluted.

Income generation and employment

By growing the food in one's own backyard or farmland, producers fulfill their own basic needs or sale the products on markets, even both. As a consequence, the "fungible" and "real" income is generated (Baumgartner & Belevi, 2001). Firstly, when a household produces food for their own consumption, the saving expenses on foodstuffs can be thought as fungible income. The experiences, most from African countries, show that the saved money or income would otherwise be spent on basic needs or invested in household capital. Peri-urban agriculture is therefore playing important role in mitigating poverty. Secondly, if there are more products than household needed, they tend to sell the surpluses on market, which comes to another complementing source of household income. In this way, urban agriculture not just increases food security.

Liu and Xu (2008) explore the interaction between urban agriculture and peasants' income in China and find that there is a synergetic relationship between increasing peasants' income and urban agriculture, and competition relationship between maximization of short-term income and sustainable development of ecology.

There is also a connection between urban labour market and urban

agricultural production. Within the more urbanized cities, more and more urban unemployed labour and migrants fail to find adequate employment, then they tend to work on farm for subsistence. The phenomenon of urban agriculture in many cities of the developing world is a reality although its magnitude in quantitative terms is still undetermined.

Generally, agriculture is not the only source for households' income, but the largest employment sector, especially in developing countries. Peri-urban agriculture creates employment in production, processing, marketing and other related economic activities. It is also an important source of employment for women (Pasquini, 2006). While, Nugent (2000) insists that peri-urban agriculture does not make a substantial contribution towards urban employment according to official data. He explains it as the conflict between labour force skills and needs of local employers, even the ability of local economy to absorb them.

Public health

The aim of public health is to promote the well-being, prevent diseases and disabilities, and enhance the quality of life (Baumgartner & Belevi 2001). Peri-urban agriculture can contribute to communities in both physical and mental way. On one hand, peri-urban agriculture provides green spaces in urbanized cities, which can reduce stress, create a sense of peacefulness. A study conducted on peri-urban parks in Amsterdam also confirms that besides many environmental and ecological services, urban and peri-urban nature provides important social and psychological benefits to human societies, which enrich human life with meanings and emotions (Chiesura, 2004).

On the other hand, working on a small-scale farmland is good chance to do physical exercise and strengthen physical quality. Public health can also be classified into traditional health hazard and modern health hazard. Traditional health hazards are more related to undernourishment while modern health hazard mainly focus on the pollution, stress and over-nourishment. Since urban agriculture can help to increase food security, provide more green spaces, and decrease in health risks by properly waste disposal. Even so, there are still some potential health risks derived from poorly practiced urban agriculture.

Social inclusiveness

According to Bailkey, Wilbers, & van Veenhuizen (2007), urban and peri-urban agriculture can contribute to the social inclusion of marginal groups by providing them opportunities to feed their families and raise their income, while enhancing self-confident. Others indicate that peri-urban agriculture plays an active role in educating urban and peri-dwellers on natural knowledge, agrarian techniques and keeping regional culture diversity. Peri-urban agriculture provides a useful space for social interaction, and Chinese scholars think it is a now and efficient way to promote “urban-rural integration” by harmonizing urban and rural economy and society (Qiu, Cheng, & Zhu, 2005)

Ecological benefits

By implementing peri-urban agriculture effectively, the diversity and quality of the ecological system may improve undeniably, but the effects are

not as noticeable as the social and economic effects. Urban waste is considered one of the most serious and pressing urban environmental problems. To explore the contribution of urban agriculture to ecological system, a lot of studies focus on the inputs and outputs of local production and consumption. Smit and Nasr (1992) indicated that Peri-urban agriculture is a tool to convert the consume-dispose open loops into consume-process-reuse closed loop system that makes use of urban waste, like organic waste, wastewater and solid waste, and reduce the amount of landfill and carbon emission, thus reduce the ecological footprint in cities (Sharp, Imerman & Peters, 2007). A considerable potential of peri-urban agriculture could consist in reusing urban solid and liquid waste for local food production, thereby saving resources and energy.

Table 2: Classification of organic waste materials

Animal wastes	Plants Residues	Industrial Waste	Residential waste
Manure, Urine, Feathers, and fur, Bones and Blood, Bio-digested waste	Crop residues, Tree and hedge clippings, weeds, Leaves and branches, Sawdust and ashes	Coffee pulp, Sugarcane residues, Rice husks, Paper, Cardboard and other bio-degradable waste, Bio-digested waste.	Organic household waste

Source: Anikwe&Nwobodo (2002)

In 2002, Anikwe and Nwobodo classified the organic waste within

urban and peri-urban agriculture as supplement soil fertility in Cuba as animal wastes, plants residues, industrial wastes and residential waste. Many urban by-products become agricultural inputs, including domestic and market composted that are used on crops, and brewery by-products that are used to feed animals.

On the other hand, the by-products of urban agriculture themselves become inputs elsewhere, sometimes in the case of integrated crop-livestock production system, such as manure organic fertilizer used in crops growing, and crop straw for fodder and biogas generating. In northern China, waste wheat and maize straw has been turned into biogas generation and thus make use of biogas as cooking energy, bio slurry as crop fertilizer in rural households (Altieri, 1999).

While by recycling of significant amounts of household waste and animal excrements, and by make better use of land in or near the marshlands and is also preventing the pollution of surface water properly managed, ban horticulture is making important contributions to environmental sustainability. And even greater contribution is expected by recycling household waste and liquid waste on a much larger scale and putting it at the horticulturalists' disposal at competitive prices, and by protecting the natural water-storage function of the swamps (Brock & Foeken 2006).

Problems and constraints of peri-urban agriculture

Health risks

In general, urban agriculture would cause risks to the health and ecological environment. The Food and Agriculture Organization (2008)

pointed out that often in a large number of long history of intensive commercial district, inappropriate use of chemicals (fertilizers, pesticides and insecticides), may lead to pesticide residues in crops or groundwater. It is said that urban agriculture uses urban waste for example, liquid or solid wastes contaminated by pathogens, metals as inputs to bring more risk the public than traditional agriculture does. Also the urban and peri-urban land for production of food may be detrimental to the public interest. And if the practitioners or other persons who lack of management knowledge or are not familiar with hygiene, health problems of animal feeding may also occur.

The use of wastewater and organic waste in agriculture may increase contaminate in agricultural products and pollute soil and underground water. A study on per-urban farming practices in small-scale vegetable farming systems in the Yangtze River Delta Region of China shows the environmental risk that application of cow manure, Nitrogen (N) and Potassium (P) to vegetables results in high Cd in some vegetables and high concentrations of N and P in surface water (Huang, 2006). A study conducted by Anikwe and Nwobodo (2002) brought to bear that, dumping urban waste have negative influence on the soil properties and productivity at the dumping site in long term.

Land problems

It has been realized that the benefits and its contributions to cope with challenges in sustainable urban development, many governments and organizations begin to integrate urban and peri-urban agriculture as an active part in the complex urban context. Land problems are classified into two groups, land use and soil property influenced by peri-urban agriculture.

However, empirical evidence presented here from the city of Kano in northern Nigeria suggests that urban agricultural activities and livelihoods are being threatened by acute problems of tenure insecurity and encroaching land development (Lynch, Binns & Olofin, 2001). And also UPA in Cuba is also not the problem free with the major limitation of land and water scarcity as well as poor quality of urban topsoil and irrigation water in the densely populated areas (Altieri, 1999).

Urban and peri-urban agriculture is an illegal and unaccepted land-use in most African cities at the beginning. Recently, realizing the benefits derived from urban agriculture, some planners and governments began to take it into the city planning framework to ensure its legal status. On the contrary, in most Asian countries, urban agriculture is accepted as a normal urban function and land use (Smit, Nasr & Ratta, 2001) for they recognize the benefits of urban agriculture applied in densely populated cities with intensive farming systems. In the last century, China had developed a strategy and policy, which include land planning and waste disposal to support urban agriculture. So does Japan, the country which include urban agriculture in the regular census.

Authority's perceptions

The greater challenges in the implementation of peri-urban agriculture is that most urban planners and environmental managers, either with the government or with NGOs, are more concentrated on the economic benefits of peri-urban while not even aware of the its possible social and environmental benefits. As Quon (1999) found that without awareness of the social, economic and environmental benefits of urban agriculture, clear government

response passively in the land use planning process, and provide fewer resources, technical and financial support.

Approaches to promoting peri-urban agriculture

The visible growth in urban and peri-urban agriculture throughout the world cast a spotlight upon some existing issues in agriculture and food security issues in arises new ones (Mutiarra, 2008). The immediate needs are observable and have long been commented upon even as conditions intensify. These include a need for effective ways to deal with urban food security and for basic infrastructure in urban areas to protect public health and the environment and for integrated resource management and land use planning (Masakazu, 2003). These issues all arise in the context of peri-urban geographical space. However, new perspectives stimulated by the growth of peri-urban agriculture, present opportunities to address the issues in innovative ways:

Land use planning response to peri-urbanization

Urban planning plays a very important role to augmenting the capacity of cities to accommodate with population growth. Nevertheless, poor planning leads to inefficiencies and institutional rigidities that hasten diminishing returns and cause inoperative capacities (Dutta, 2012). Good planning, however, allows a city to take more than what the average would permit. In an attempt to control the better management of urbanization, governments all over the world have adopted both micro and macro-economic policies designed to mitigate if not reduce the tempo of peri-urbanization to

manageable levels. Land use planning and management tools have, over the years, played a crucial role in avoiding and mitigating the adverse impact of rapid, unplanned urbanization (Allen, 2003). As a primary tool, physical planning is established to address mid and long term problems. Physical planning as a complement to social and economic conditions has an important role to play in helping achieve the aims of the social, economic, and other forms of planning. The end result of this is manifested in a meaningful and useful organization of facilities in space (Dutta, 2012). This involves the proper use of land, development of a good and efficient land policy, planned infrastructure, and the development of new land among many others that favor decentralized economic development. Such a planning approach would be aimed at ensuring orderly spatial development which is consistent with land use.

Strategic planning

Strategic planning is another approach that integrates urban development to achieve growth in city and at community levels (Drescher, 2001). The outcome of the planning process is not just a physical development covering land, infrastructure, finance and institutions. In Ghana, some of the strategies in use include the promotion of urban infrastructure and the development and provision of basic services (Deelstra & Girardet, 2004). In terms of housing for the urbanites, the low cost housing programme in the 1970s and the recent affordable housing project are aimed at lessening the hardships in the urban areas by the provision of affordable housing (Dutta, 2012).

The Ghana Poverty Reduction Strategy (GPRS) II also addresses issues such as providing and implementing development plans for urban centers, enforcing rules on land use plans and accessibility, coordinating all aspects of town development and facilitating public and private partnership in the development of urban infrastructure (Gerrard, 2010). Fostering the growth of settlements brings about rural transformation, improving infrastructural facilities in slum areas and restricting the formation of new slums. As a result, a new Land Administrative Project (LAP) was launched in 2003 as the implementation strategy for the new National Land Policy (NLP) in Ghana (Doan & Oduro, 2011).

The project has so far completed legislative and judicial reforms, established ten (10) customary land secretariats in each of the ten regions, supported the capacity building of land-based academic and research institutions, and identified and measured forty five geodetic reference points. In addition, much of the violation of planning regulation can be avoided by resorting to the law where necessary (Adell, 1999). Masakazu observed that, regulatory instruments such as land and household registration, property tax systems, and building and land development permits are all important basic tools that strengthen effective implementation of spatial plans (Masakazu, 2003). Thus, the basis for development control is planning legislation.

In pursuit of this, planning authorities have been delegated with powers to enforce planning legislations and use their discretions where absolutely necessary. Besides, the Local Government Act, 1993 Act 462 (sections 46-78) also creates each District Assembly as a planning authority. The assembly is to in effect, issue development permits, prepare development plans, and take

such actions, and decisions necessary to bring about the overall development of the district so far as it is not inconsistent with national development plans (Doan & Oduro, 2011).

The rationale is to increase rural development in order to curtail rural urban drift. Zoning regulations are also a constituent of the response of land use planning to urbanization. This promotes efficiency and allow for easier regulation of urban development. Zoning techniques may include designation of sensitive land resources and areas, establishment of buffer zones, management of hazard prone lands and protection of cultural resources (Dutta, 2012). Others also include the protection of green fields, preservation of prime agricultural lands and discouraging excessive urban sprawl. These may be applied to implement master plans and guide urban development to spatially appropriate areas.

Geographic Information System (GIS)

The Geographic Information System (GIS) is a technical tool widely used as part of effective urban planning approach. This approach is gaining increasing importance in Ghana as a tool for decision making in planning since it links together different data sets (Drescher & Holmer, 2007). In this system, accurate information on land prices, supply of serviced land, present and future land projects and housing technologies can be accessed. This aids the inadequately staffed local governments to better manage rapid urban growth. Such information supports planning, decision making and private sector investment. Meaningful planning starts with efficient information channels and trickles down to effective institutional capacity (Pinderhughes,

2004). However, the realization of plans is made possible by a legal body, hence the need for planning laws and regulations and the astute institutions to enforce them.

Studies on integration of peri-urban agriculture into sustainable city development

This section examines three case studies that tend to throw much insight about the beauty of integrating peri-urban agriculture into sustainable city development. The three case studies are based on the experience from Freetown, Dar Es Salaam and Cagayan de Oro. The relevant lessons for Ghana would be drawn in the end. All these case studies were adopted from van Veenhuizen (2006: p53-86).

a) Building an independent town by means of urban agriculture- the case of Freetown

Peri-urban agriculture practice in Sierra Leone, especially in the capital, Freetown, is probably as old as the inception of the city itself. However, the importance of urban agriculture was never appreciated until 1991 when the capital was besieged by different armed fighters determined to topple the then legitimate government of Sierra Leone. The population therefore depended entirely on food aid and agricultural produce from urban agriculture (Hoekstra, 2010). In essence, urban and peri-urban agriculture was the only job opportunity that existed, which only required basic inputs such as tools, fertilizers and labour to economically engage in urban farming activities. Indeed, almost all available land in the city was fully cultivated and a marked increase of over 60 percent urban agriculture production was realized. Even

today, urban agriculture continues to play a major role in contributing to poverty reduction, and to food security thereby assuring human security.

Urban and peri-urban agriculture is situated in private (e.g. residential) and public or institutional lands, often with complex land tenure arrangements. Most institutional lands are leased, while private and public open space lands are seasonally rented. Land is a primary constraint, agricultural land use being in competition with housing, commercial and industrial land uses. Use of external inputs, like fertilizers, is generally low, and animal manure (from piggeries and poultry units) is mainly applied. Rainwater, streams, pipe borne water, household wastewater and groundwater are common sources of water in crop and livestock activities. Apart from rainwater, most water sources are contaminated and polluted through human and animal excreta, as well as domestic and industrial effluents.

A number of institutions, such as the Ministry of Agriculture, Forestry and Food Security (MAFFS), the National Association of Farmers of Sierra Leone (NAFSL) and Freetown City Council (FCC) provide agricultural extension services (mainly on crops) to farmers. Almost all urban farmers belong to a farmers' association or community-based organizations, except those individuals who farm the backyards of their homes.

Urban and peri-urban agriculture is now also seen as being fully part of the national development strategy and this has opened several opportunities for urban farmers, especially for small-scale enterprises run by unemployed the youth and poor women engaged in value addition and marketing of agriculture produce, including financing, technical support, research and extension services, and assistance for business planning and development.

Currently the two interlinked priorities for FUPAP are mapping and allocation of land for urban and peri urban agriculture and access to credit and finance by urban and peri urban farmers. The current FROM SEED TO TABLE (FSStT) project focuses on an integrated cluster of enterprises which address the organic waste product marketing challenges through a number of uses and product development. The cluster of enterprises under development includes - besides waste collection and composting - high value horticulture, flower and ornamental plants production, bio gas, enterprises coordinated with a cluster of related enterprises in high value horticulture, compost selling, briquette making, piloting of mixed compost and human waste fertilizers products.

b) Integration of urban and peri-urban agriculture into urban planning- the case of Dar Es Salaam

In 1992, the city of Dar Es Salaam adopted the Environmental Planning and Management (EPM) approach in its City Consultation. This new approach has been the engine of change in many aspects and also related to urban agriculture. In the consultation, stakeholders agreed that agriculture in the city contributed substantially (almost 30 percent) in household food supplies and that it had become an integral part of urban livelihood strategies. A Working Group was formed to work out strategies for putting urban agriculture on the city agenda. The Working Group used a participatory approach to come up with a strategic plan on urban agriculture for the city.

The results of this process are good: from action, plan preparation, implementation of demonstration projects and further integration of agriculture in the city's urban zonification. Findings of the working group

included results of these projects and were a basis of deciding on where and to what extent agriculture can be practiced in the city as reflected in the Strategic Urban Development Plan (SUDP). In this plan, special land zones have been designated for agriculture. Ideas necessary for revising municipal by-laws and regulations were also worked out and a platform for coordination established and enhanced. The SUDP also has deliberately set apart several areas to be used for large- and medium-scale urban agriculture in the future and gives corresponding development conditions. This is contrary to the earlier "zonification" where an area could only be considered for agricultural activities while awaiting to be assigned other to use such as residential or industrial areas.

The major difference is that the Master Plan considered UPA as a transitional land use whereas the SUDP considers it to be an important activity with a very important contribution to its citizens. Recognition is reflected in several laws and regulations, among them are the Agricultural and Livestock Policy of 1997 as indicated by GoT (2006) and the National Human Settlements Development Policy (Jan, 2000). In Dar Es Salaam, it is seen, that UPA can be effectively integrated in urban land use plans.

c) Building food-secure neighborhoods, the role of allotment gardens- the case of Cagayande Oro

Cagayan de Oro is one of the three model cities in the Philippines under the UN-Habitat Sustainable Cities Programme due to its efforts in addressing the challenges of urban environmental management and food security. This is particularly evident in its allotment garden programme, which

enables multi-functional land uses such as food production and income generation, treatment and nutrient recycling of biodegradable household wastes and excreta, as well as open spaces for community and family activities. The first allotment garden of Cagayan de Oro was established in 2003 (Holmer & Drescher, 2005). Since then, the number has grown to five self-sustaining gardens located in different urban areas of the city, enabling a total of 50 urban poor families to get legal access to land for vegetable production. These allotment gardens are characterized by a concentration in one place of six to twenty small land parcels of about 300 m² each that are assigned to individual families, who are organized in an association. In the allotment gardens, individual families cultivate the parcels.

Aside from contributing to the food security of the community, the gardens are also essential for the successful implementation of the city's integrated solid waste management programme as mandated under Philippine law. In the city districts that have an allotment garden, the amount of residual wastes delivered to the landfill site has been reduced by more than one third since the segregated biodegradable household wastes are converted into compost in the gardens. So-called ecological sanitation ('Ecosan') toilets have been recently established in four of the five areas. They serve as show cases for improved sanitation. The city government of Cagayan de Oro is presently mainstreaming the allotment garden concept into its overall city planning and development, which will also use participatory GIS-based approaches to identify suitable areas for future garden sites. A city ordinance is presently being prepared to reduce taxes for landowners who make their land available for this purpose.

Lessons on integrating peri-urban into sustainable city development for Ghana

The question of land use planning and urban and peri-urban agriculture integration seems questionable particularly in urban planning and management system in the country. Many have raised issues concerning the quality of produce from peri-urban agriculture looking at the location and water used by farmers. However, it is interesting to note that peri-urban agriculture integration into urban planning and management systems is a major problem in Ghana.

It is clear from the literature that land is very critical to the survival of urban agriculture. The further integration of urban and peri-urban into municipal and regional urban planning (for example by creating easily accessible farming zones) remains a challenge to be tackled. Although such official recognition of UPA as a legitimate urban land use is an important step, the challenge again remains to operationalize the policy in clear legal and institutional frameworks. As in the case of Cagayan de Oro, London and other cities in Africa and Europe, there is the need to encourage allotment gardens. A municipal land bank for peri-urban could be set up and conscious efforts should be made to establish allotment gardens. The inclusion of open spaces in urban planning and their protection requires protective laws and regulations. To better enable financial requirements public private partnerships should be encouraged.

A comprehensive plan on sustainability of cities including food security is essential. In Ghana peri-urban agriculture is recognize in bye laws of city authorities. It is important to note that policies are only as good as their implementation. Therefore, it is imperative to continue to advocate at the

government level to ensure that these issues are addressed. This may include creating a resolution in support of these goals or addressing the zoning code. For the city economy to grow and become resilient there is the need for extension services to be extended to these urban farmers also. This will help them to acquit themselves with best practices to minimize the health and environmental concerns raised by people. In the implementation of projects for the development of peri-urban agriculture in Ghana the availability of an efficient system of governance, providing feedback, is a guarantee for the performance of the decisions made and acquires great importance.

The literature has made it clear that planners have a lot to do when it comes to integrating peri-urban agriculture into sustainable city development. Planners have many opportunities or instruments available to them to effect land use changes. Takawira, et al., in van Veenhuizen (2006:53-86) further describe and analyze levels of planning and how to integrate urban farming and actors. Despite the rapid urbanization and the growing concern for food security urban planners can help ensure sustainable city development.

In Ghana urban planners have the legal backing to zone or allocate land for specific uses for the welfare of all citizens. They are supposed to prepare layout or schemes detailing the various land uses keeping in mind the main principles of planning of ensuring; safety, equity, aesthetics and economic use of land. They also have other instrument like the master plans, structure plan, and even the site plan to include urban agriculture in the city economy, adopting health regulation, advanced technology and waste recycling to ensure sustainable cities.

It is clear from the foregoing that, urban planners have all the instrument and legal backing to integrate urban agriculture into city's economy but this has been relegated to the background. This could be attributed partly to the ineffectiveness of the current tools used as development control in the country.

Conceptual framework

From the literature it clear lack of infrastructure, poverty coupled with high food prices has threatened the livelihoods and rendered many of the urban and peri-urban poor vulnerable. Some therefore resort to agriculture as a livelihood strategy in order to cope with their dietary and nutritious requirements.

However, many factors are inhibiting peri-urban agriculture farmers to take agriculture as a livelihood strategy. Among the most frequently mentioned recommendations in the literature were changes to land use planning policy to recognize and support peri-urban agriculture. The issue of land, access to water and financial assistance are part of the problem. These myriads of problems can however be overcome with the right measures in place.

The Planning Institution and Policy framework are the two driving forces to ensure urban food security and sustainable city development in the long run (Hungwe, 2006). Many of the cities that have been successful have policies at some level that positively recognizes the practice of urban agriculture, although municipal and metropolitan level policies have not been adopted in all cities.

Recognition in policy might take the form of land use Zoning, Master plan, Structure plan and detailed planning scheme where agriculture is a primary or tertiary land use. These are the major tools available to planners to effect land use change and integrate urban agriculture (Lee-Smith, 2010). Policy also serves as a means to counter the potential negative health and environmental effects of agricultural activities; surveyed cities identified restrictions to livestock keeping in residential areas, and to where in the city farming can occur.

With policy in place it will lead to the promotion of urban food security. Promotion of peri-urban food production should take into account the critical role of equitable access to land and water in sustainable peri-urban development. The outcome of this will lead to the proper allocation of land for peri-urban farmers, inputs and equipment, access to water and market.

Successful integration of peri-Urban Agriculture into land use planning of any given economy will lead to the achievement of many economic, social and ecological outcomes (Maxwell, Levin, Amar-Klemesu, Ruel, Morris & Ahiadeke, 2000). Ecologically, it will lead to urban greening, open green spaces, reduction in noise and air pollution in and out of the city. All these ecological outcomes from peri-urban agriculture will improve the environmental cover of the areas both in and around the city leading to a habitable urban environment.

Socially, sustainable peri-urban agriculture will lead to improve livelihoods and meeting the dietary needs of many of the urban poor. It will also improve their health status and provide them the opportunity to be out of poverty as a soaring food prices which makes them vulnerable. It has also

been established that community revitalization is achieved when neighborhoods take pride in a community garden. When inner-city residents of urban gain the ability to grow and market their own food, and when inner-city farmers' markets provide new opportunities for entrepreneurs and commercial farmers it improves their social safety net and contribute to community building (Hungwe, 2006).

Successful integration also has economic benefits. It leads to income and employment generation. Food production, processing and marketing also contributes to generating income and employment for many poor urban and peri-urban households. Although the production levels and turnover of individual peri-urban producers or vendors in many cases is small, their high number in each different area make their overall contribution to the urban economy highly relevant. In this case the rationale for peri-urban agriculture is its economic value and its capacity to generate local economic development.

All three benefits, thus economic, social and ecological benefits will lead to a productive economy. The main aim is to achieve a productive economy, one in which produce from peri-urban areas is used to feed urban areas. Sustainable peri-urban planning therefore aims at achieving economic, social and environmental equity while improving the lives of the people. For that to happen we need to have a sustainable city form as well as provision and proper management of the services. Thus, in order for a city or urban area to be sustainable it needs to produce and manage basic services like water, waste, and in a way that it conforms to the principles of sustainable development. In other words, the city should be able to produce and distribute the services in an economic, environment friendly and equitable way. This is what is

guaranteed when policy and the planning institution with all its tools are put in place will secure in the future.

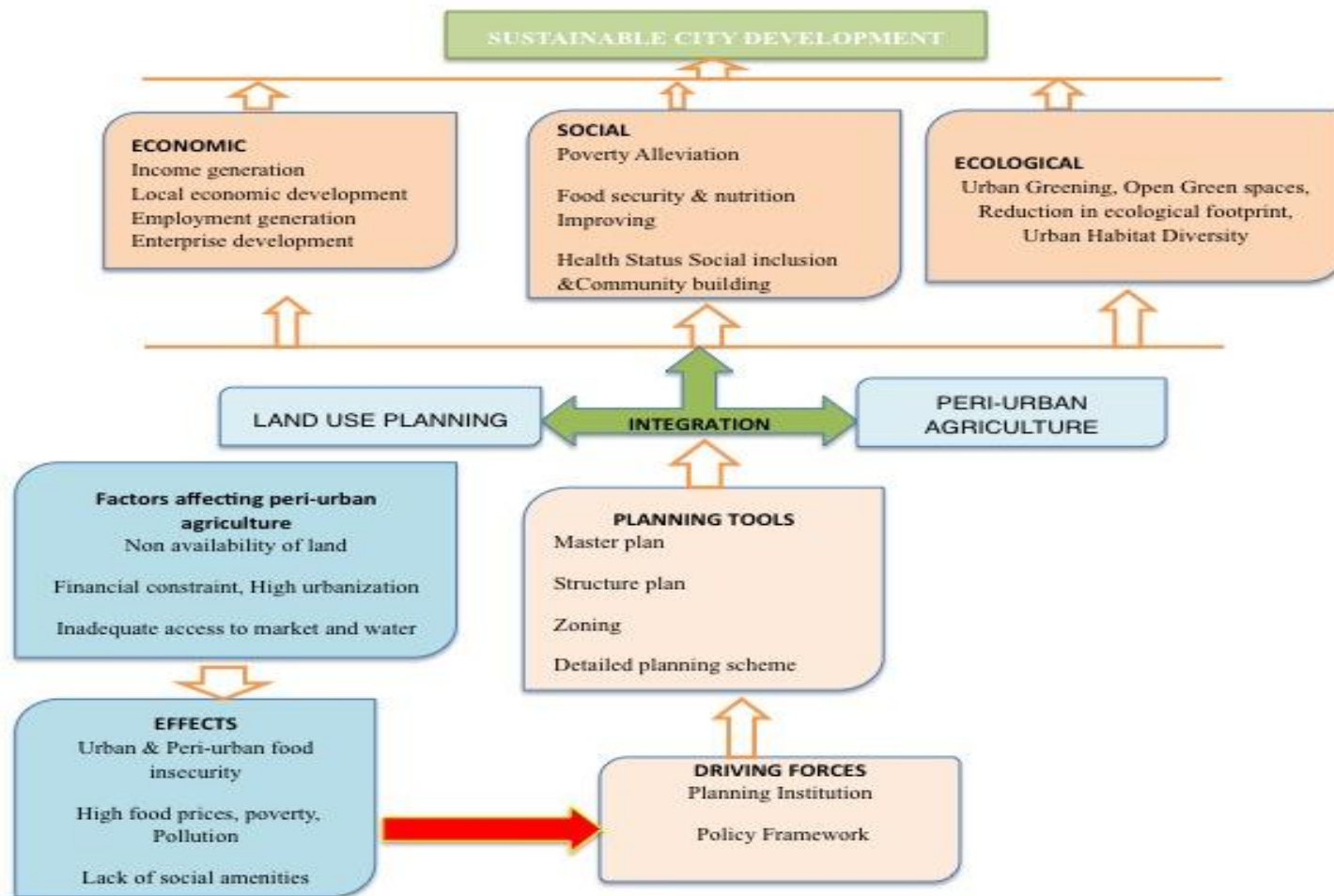


Figure 3: Conceptual Framework

Source: Adapted from Hungwe (2006)

CHAPTER THREE

METHODOLOGY

Introduction

This chapter provides the approach that the study followed. It describes the study area, study design, data and sources, the target population, sample size, sampling techniques employed, the research instruments, data collection/processing and analysis, and ethical issues arising from the research.

Profile of the study area

Location and size

Sekondi-Takoradi Metropolitan area is located between latitude 4° 52' 30" N and 5° 04' 00" N and longitudes 1° 37' 00" W and 1° 52' 30". The metropolis is bounded to the North by Mpohor-Wassa East, to the South by the Gulf of Guinea, West by Ahanta West District and to the East by Shama District. The metropolis happens to be the smallest district in the region with a land area of 219km², with Sekondi as the administrative headquarters (Doan & Oduro, 2011). However, it is the most populated district in the region. The metropolis is strategically located in the southwestern part of the country, about 242 km to the west of Accra the capital city and approximately 280 km from the La Côte d'Ivoire in the west. It is thus strategically located considering its closeness to the sea and the airports and accessibility to major cities by rail and road (retrieved from <http://stma.ghanadistricts.gov.gh> on 28/08/2014).



Figure 4: Study area in regional and national context

Source: Department of Geography and Regional Planning, UCC (2014).

Climate

The metropolis lies within the South-Western Equatorial Zone. It has fairly uniform temperature, ranging between 30° C in March and 22°C in August. The metropolis has a mean annual rainfall of 2,350 mm. It experiences heavy rainfall in May and June with the minor rainfall occurring between September and October. Sunshine duration for most part of the year averages 7 hours per day. Relative humidity is generally high throughout the year between 50 percent and 70 percent in the dry season and 75 percent and

85 percent in the wet season (retrieved from <http://stma.ghanadistricts.gov.gh> on 28/08/2014).

Vegetation

The vegetation in the metropolis is highly wood land in the northern and central parts, while thicket is intermingled with tall grass species along the coast, especially in areas where there are no permanent crops. The land cover of the metropolis can broadly be categorized into five types, namely, moderately closed tree canopy with herb and bush cover, moderately dense herb or bush with scattered trees, mosaic of thickets and grass with or without scattered trees, planted cover and settlements (retrieved from <http://stma.ghanadistricts.gov.gh> on 28/08/2014).

Topography and geology

The metropolis is of varied topography. The Central area of Takoradi is low lying with an altitude of 6 m below sea level. Fortunately, the numerous low-lying areas in the metropolis are interspersed with ridges and hills ranging from 30 – 60 m high. Sekondi-Takoradi is characterized by faulted shales and sandstones of various types resting on a hard basement of granites, gneiss and schists. The faulting system has marked influence on the landform especially along the coastline which clearly follows the main fault direction of North East (retrieved from <http://stma.ghanadistricts.gov.gh> on 28/08/2014).

Economic profile

The Metropolis is the third most industrialized and largest city in Ghana and it is gradually emerging as the 'Oil City' since the discovery of oil in commercial quantity in the country. The services sector contributes to 59.9 percent, Agriculture 21 percent and Manufacturing 19.1 percent to the local economy (Manu, Twumasi & Coleman, 2006). The city can be accessed by air through Kotoka International Airport, Accra with a domestic scheduled flight to Takoradi due to the existence of an airport managed by the Ghana Airforce. The city also has a seaport and a very good road network, which links all parts of Ghana as well as the neighbouring countries of La Cote d'Ivoire, Burkina Faso, Mali and Niger. The metropolis is well developed, with the best of socio-economic infrastructure and facilities in terms of electricity, water, telecommunication, education, health with industrial set ups and other several economic activities(National Development Planning Commission, 2005).

Agriculture activities

About 21percent of the metropolitan population which is estimated as 84,849 is engaged in agriculture and are into crop farming had still remains at subsistence level due to problems of the topography negating application of mechanized farming and several challenges that affects production (Manu, Twumasi, & Coleman, 2006). The major crops cultivated in the metropolis are maize, cassava, cocoyam, yam, plantain, citrus, oil palm and sugar cane. Out of the number 6percent is engaged in fishing that is the other predominant component of the agriculture sector due to the available long stretch of coastline. Fish production in the metropolis is noted to be decreasing since 200,

for reasons attributed to artisanal fishing, per-trawling by big trawlers and bad fishing practices done overtime. Also no cold store is located at the landing beaches leading to post harvest losses. Again there are no processing industries there by providing low value and therefore low income (Manu, Twumasi, & Coleman, 2006).

Justification of selecting the study area

The study area for this research was selected on the basis of acquiring the richest possible data rather than gathering fully representative information for the researched phenomena. In order to understand and analyze the wider context of peri-urban land agriculture in an era of rapid urbanization in Ghana, STMA was selected as the study area for this research on the basis of the purposive non-random sampling principle. The twin city capital, Sekondi and Takoradi is an important urban center and one of the fastest growing cities in Ghana, both demographically and spatially due to discovery of oil at the Tano basin.

Also, little research on peri-urban agriculture has been done into detail on the region and for that matter the metropolis. According to the master plan in force since 2010, it is only the north-west part of metropolis that have been allotted for agriculture, even though massive agriculture is being practiced over time within the south west and east of the metropolis. Hence, there is the need to map up other peri-urban farms within the STMA.

In addition, the metropolis was chosen to give opportunity to compare the detailed report about peri-urban agriculture, as it is the third largest urban centre in the country.

Research design

A case study is an empirical inquiry that investigates complex and contemporary societal phenomena in depth (Darke, Shanks & Broadbent, 1998). The approach can predominantly be employed in relation to the discovery of information following an inductive logic, to describe what is happening in the case study setting (Macpherson, Brooker & Ainsworth, 2000). The case study approach is also helpful when “how” and “why” questions are being posed, and when the investigator has little control over events in a situation too complex for surveys or experimental research (Stake, 2000). Another strength of the case study approach is that it allows the researcher to use a variety of data sources and research methods (Darke, Shanks & Broadbent, 1998). Thus, the case study approach creates an opportunity to combine different data collection techniques such as interviews, observations, questionnaires, Focus Group Discussions (FGD) and document analysis.

Consequently, it was clear at the beginning of the research that the strengths of case study research would facilitate attainment of the research objectives. Some classic examples of complex and contemporary societal phenomena that can best be investigated using the case study approach is to assess how peri-urban agriculture can be integrated into an economy of Sekondi-Takoradi Metropolis. The investigation of such issues also required multiple sources of data and data collection methods, which made the use of a case study approach unavoidable.

Moreover, the choice of the case study research approach was also influenced by the nature of the research questions posed. The research questions are both descriptive and exploratory in nature. Thus, the research

can be said to be a descriptive-exploratory case study, as it qualitatively describes and explores a chain of links between a set of socio- spatial phenomena in the peri-urban areas, mainly related to agriculture.

Sample size determination and sampling methods

Given the available resources and the scope of the research, a sample size considered to be representative was taken from the study area. A multi-stage sampling technique was used to select the study areas. At the first stage, Sekondi and Takoradi peri-urban areas were selected purposively. Similarly, in the second stage of the case study area selection process, seven (7) peri-urban areas, namely; Airport ridge, Kwesimintsim, Airforce, Esiepon, PTC, Ketean and Kojokrom were selected using a purposive sampling approach. The selection of the specific peri-urban in and around Sekondi and Takoradi was based on: the degree and trend of urban expansion on the peri-urban areas; the frequency and practice of peri-urban agriculture within such areas.

After selecting the specific peri-urban centres, the next task was selection of the sample respondents for questionnaires. 129 farmers who have farmlands on the fringes of Sekondi and Takoradi Township were chosen as sample respondents for the interview guide. They were selected through a purposive sampling technique. This technique was used because of the difficulty of getting complete and accurate population frames. It was also believed that current feelings on the overall process of farming on unapproved lands could not make obtaining information easy from these respondents.

Moreover, interview guides were also administered to 3 key informants from Sekondi Takoradi Metropolitan Assembly, Town and

Country Planning Department, Ministry of Food and Agriculture. These key informants were selected purposively from the Metropolis. The inclusion of these related professionals from different implementing agencies as sources of information was performed with the intention of crosschecking data obtained from the local peri-urban farmers and it also served to obtain professional opinions about the peri-urban agriculture within the Metropolis.

Data collection instruments

Once the research problem was formulated, the next step was identifying what kind of data was required to research the problem, and also what kind of analysis was appropriate to analyse the data. The choice of any particular data collection and analysis methods is always determined by the nature of the research topic, the particular characteristics of the research problem, and the specific information sources used (Darke, Shanks & Broadbent, 1998). In fact, it is often appropriate to first determine the type of analysis – quantitative or qualitative – required to investigate the research problem, and then determine the type of data to be collected in order to make that analysis (Iacono, Brown & Holtham, 2009). Thus, the data collection and analysis methods employed in this research were selected after careful consideration of the sources and availability of the required data.

One of the principal advantages of using the case study approach is that the researcher is able to use mixed and multiple sources of data. Following the case study research tradition, both quantitative and qualitative data were collected from primary and secondary sources of data. The main sources of data and data collection instruments were interview schedule, key

informant interviews (both structured and open-ended) and direct field observations. This section therefore describes the main data collection tools employed in the study.

Interview schedule

Interview Schedule is one of the key primary data collection tools and was mainly used for achieving objectives one, two and three. The tool was considered an appropriate tool for this research, as it enabled the researcher to obtain elaborated answers from respondents. The contents of the interview scheduled were focused on the opinions, feelings and preferences of peri-urban (see appendix 4). Interview Schedule proved to be very useful and appropriate instruments for collecting data on facts and personal opinions (Iacono, Brown & Holtham, 2009). After the completion of preparing the questionnaire, a pilot test was carried out on 10 peri-urban farmers in the research area to test the relevance and clarity of the questions. The pilot testing was instrumental to ensure the simplicity of the messages, message harmony, and the clarity of questions vis-à-vis the intended respondents. Ambiguous and irrelevant questions in the draft interview Schedule were revised and finalized based on the results of the pilot test.

For the purpose of simplicity, the questionnaires and interview questions were prepared in English and translated into the local language; Fante.

The data collectors, all students of University of Cape Coast, were recruited and provided training on how to administer the interview Schedule. They were

also enlightened on the contents of the interview Schedule to enable them to understand the questions.

Key informant interviews

Key informant interviews were also carried out to augment and triangulate the information obtained from other data collection tools. Key informant interviews were held with Sekondi Takoradi Metropolitan Assembly (see appendix 2), Town and Country Planning Department (see appendix 1), Ministry of Food and Agriculture (see appendix 3). The interview questions posed to the key informants focused to achieve objective 4 and 5. Generally, the interview questions focused on peri-urban agriculture development and city development issues within the Metropolitan Assembly.

Direct Field Observations

Field observation was another primary data collection tool employed for this research. Observational evidence is often useful in providing additional information on a research topic. Field visits were also undertaken; it enabled the researcher to obtain first-hand information. A checklist for field observation purposes was prepared before the field visits. In addition, photographs showing the different farms and characteristics were captured in the field.

Data processing and analysis

The final stage of every research project focuses on analysis and interpretation of the data collected through different methods. The process of

data analysis involves the search for things that lie under the surface of the data and targets the core elements that explain what these things are and how they work (Iacono, Brown & Holtham, 2009). Quantitative and qualitative data analysis methods are most common. Natural science researches are traditionally inclined toward 'hard' quantitative (positivist) analyses. On the other hand, qualitative analytical methods can be used for social science research, which is more related to subjective human feelings and emotions and thus difficult (or impossible) to quantify (Stake, 2000). It is apparent that in the real world, things do not fall neatly into either the qualitative or the quantitative category and it is appropriate to use a mixture of quantitative and qualitative data analysis methods (Iacono, Brown & Holtham, 2009).

This research project employed a mixture of qualitative and quantitative data analysis techniques so as to capture the complex and multifaceted reality of peri-urban agriculture. Qualitative data were analyzed using triangulation; concepts and opinion interpretation; and comparing and contrasting methods. Such data were presented in the form of text. Information gathered from respondents was summarized into statements and used to clarify some of the results obtained from the study. This also forms the basis in coming out with findings and recommendations to inform policies.

On the other hand, the quantitative data collected through questionnaires were analyzed through simple descriptive statistics using percentages and means. Finally, the results of the analyses are displayed in tables and graphs. The researcher employed the use of maps, tables, graphs, charts and diagrams to present the gathered data. Analytical tools such as cross tabulation and measures of central tendencies were used to determine trends

and averages. The data collection, analysis and validation methods employed in the study are summarized below (see Table 4).

Reliability, validity and trustworthiness

The relevance of validity and reliability of the study cannot be over emphasized. According to Carman (2000), reliability refers to “the extent to which results are consistent over time”. However, “validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are” (Carman, 2000). The study will assure validity and reliability through the use of triangulation which adopts different methods and multiple scales (likert scales).

Trustworthiness in qualitative research seeks to ask the question: “How can an inquirer persuade his or her audiences that the research findings of an inquiry are worth paying attention to?” (Stake, 2000). On the qualitative aspect of the current study, trustworthiness of the data was assured by repeating what respondents had provided for them to verify if what they have written and recorded truly represents their response. One way of ensuring trustworthiness in qualitative research is to allow informants to read their response to verify whether it matches what they intended.

Table 3: Data collection, analysis and validation methods used

Objective	Source of data	Data collection methods	Data analysis methods	Validation method
Develop a map of peri-urban agriculture lands within the STMA	Google Earth, Dept. of Geography & Regional Planning UCC	Digitizing	Quantitative	-
Analyze problems encountered in practicing peri-urban agriculture in the metropolis		Interview schedule		
Describe the significance of peri-urban agriculture in supporting the emerging oil economy of the metropolis	Peri-urban Farmers STMA	Field observation	Both qualitative and quantitative	Literature Comparison
Assess how peri-urban agriculture is being used to improve sustainable livelihoods within the metropolis	Town and Country Planning Department Metro Directorate of Ministry of			Expert interviews
Examine existing policies and interventions employed by city and urban planners in promoting peri-urban agriculture	Food and Agriculture	Interview Field observation	Qualitative	

Source: Authors compilation (2015)

Ethical issues and limitations

Social science investigates complex issues which involve cultural, legal, economic, and political phenomena (Freed-Taylor, 1994). This makes ethical issues an important component of research especially for graduate students who are expected to complete independent research to fulfil degree requirements (Michelle, McGin & Bosacki, 2004). Due to this, before administering the interview schedule, the researcher first introduced himself and briefed the respondents on the purpose of the research and sought their consent on whether they would want to take part in the research or not. Participants exercised their rights voluntarily by accepting or refusing to participate in the study. The privacy and anonymity of respondents were observed by numbering them. This made it difficult to trace specific responses to any particular respondent.

A major limitation of the work was respondents selected refusing to partake in the research. Also, some respondents were not available on their farm after three (3) visits. In solving this problem, the researcher chose other respondents who are available and ready to participate within the same given area. Another challenge experienced during the data collection was respondents' inability to quantify their output and annual income.

CHAPTER FOUR

PERI-URBAN AGRICULTURE AND POVERTY REDUCTION

Introduction

Results that were found to have more relevant information on peri-urban agriculture within the STMA are presented and discussed in this chapter. The main areas covered in this chapter include; socio-economic characteristics of respondents, employment and occupational profile of farmers, peri-urban agriculture farming characteristics, understanding planning institutions, policy and decision making process, recognizing and permitting peri-urban agriculture.

Characteristics of respondents

The purpose of the study demanded that data be generated both from peri-urban farmers and institutions who are directly involved in managing city development and peri-urban agriculture. The institutions interviewed were the Sekondi Takoradi Metropolitan Assembly, Town and Country Planning Department, Ministry of Food and Agriculture. In all, total of 132 respondents were interviewed.

Socio-demographic characteristics of respondents

Demographic characteristics of households (such as age, sex and education) have great implications on households' capacity to exercise choice

and access opportunities to build their asset base and livelihood strategies (Atamanov & Berg, 2012).

Age and sex structure

To plan effectively for the peri-urban farmers, the various age and sex structures were looked at. From Table 4, 111 respondents representing 86% from the metropolis are males, while 18 women constituting 14 percent of respondents are females; confirming what Obuobie et al (2006) indicated; that men dominate open-space vegetable production in cities in Ghana. It was observed that in some peri-urban areas no women were identified practicing peri-urban agriculture.

Over 80 percent of respondents was in the economically active working group. The greatest proportion of peri-urban farmers (49%) falls in the age category of 30-49 years whereas the youngest age group (10-19 years) comprises only 12% of the total 129 respondents. This is an indication that livelihood support is greater for the economic active population.

Table 4: Age and sex structure of peri-urban farmers

Age	Male		Female		Total	
	Count	FP	Count	FP	Count	FP
10-19	15	13.5	3	16.6	18	13.9
20-29	21	18.9	4	22.3	25	19.3
30-39	36	32.4	7	38.8	43	33.3
30-49	13	11.7	3	16.6	16	12.4
50-59	19	17.1	0	0.0	19	14.7

60+	7	6.3	1	5.5	8	6.2
Total	111	100.0	18	100.0	129	100.0

Source: Field data (2015)

n=129

Marital status of peri-urban farmers

In Table 5, respondents were asked about their marital status and the result indicates that 65 percent of respondents are married while those who are single, divorced and widowed represent 22 percent, 8 percent and 5percentrespectively. Participation of married men in peri-urban farming ensures food security for their families, making peri-urban farming a means of livelihood to their households

Table 5: Marital status of peri-urban farmers

Respondents Marital status	Frequency (n=129)	Percentage
Married	84	65.0
Single	29	22.0
Divorced	10	8.0
Widowed	6	5.0
Total	129	100

Source: Field data (2015)

Educational status

Table 6 gives an indication of the levels of educational attainment of respondents in the metropolis. The survey showed different patterns of

educational status. 52percent of respondents has had education up to the middle/ Junior High School level, 13 percent up to the Senior High or Vocational level, 3percent up to the tertiary level and 32percent has received no formal education. Despite the fact that 32percentof peri-urban farmers in STMA are illiterate, a higher percent (over 68percent) can read and write. This is really encouraging looking at the fact that education status could determine the acceptability and implementation of new farming practices, technologies and trainings on their farm given by agriculture extensions (Foeken & Mwangi, 2000).

Table 6: Educational levels attained

Levels	Frequency n=129	Percent
Primary	30	23.0
JHS/Middle	37	29.0
SHS/vocational	17	13.0
Tertiary	4	3.0
Illiterate	41	32.0
Total	129	100.0

Source: Field data (2015)

Migration

In Table 8, as much as 42.5 percent of the respondents was not members of the metropolis but hailed from within and outside the region. Out of the farmers 42.5 percent are immigrants, 49 percent of them has stayed in the area for over ten years because of the agricultural prospects of the area.

Whiles respondent who affirmed to be indigenes constitute 57 percent.. The presence of these migrants has created shared opportunities with migrants and non-immigrant residents (Krasny & Doyle, 2002; Beckie & Bogdan, 2010). However, the influx of these migrants has serious consequences on the land use changes of the area. The desire to own and use land by all these migrants has contributed to the land use changes currently occurring in the study area (Foeken & Mwangi, 2000).

Table 7: Distribution of migrants according to their source region

Response	Frequency(n=129)	Percentage
Within the metropolis	74	57.0
Within the region	35	27.0
Outside the region	16	12.0
Outside the country	4	3.0
Total	129	100.0

Source: Field data (2015)

Employment and occupational profile of farmers

Main source of employments

From Figure 5, agriculture is the main source of employment accounting for 77 percent of the total respondents, 11 percent and 8 percent for commerce and service respectively. Those involved in commerce are petty traders and some also sell the produce from their farms. There are other artisans like electricians, mechanics, cleaners, cooks and masons who are also engaged in peri-urban agriculture before and after work each day.

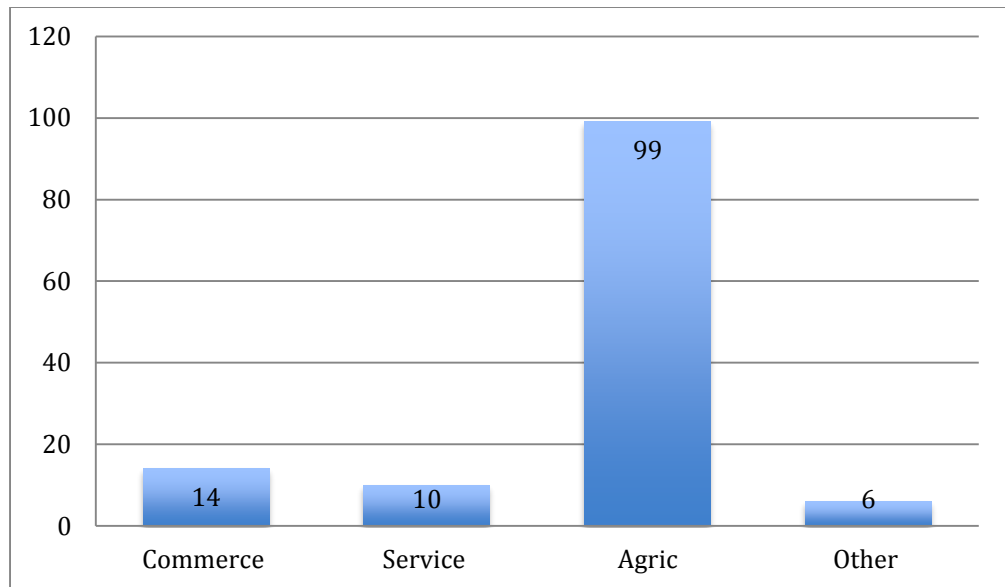


Figure 5: Main source of employment

Source: Field data, 2015

Occupational characteristics

Figure 6, shows occupational characteristics of the farmers. 74 percent of respondents are self-employed and 8 percent are casually employed and 6 percent are students. Peri-urban farming provides employment to some youths who are unemployed because more hands are needed on the farm. 73 of farmers affirmed that they employ on the average 2 people to assist them on their farms. Farmers, vegetable sellers, suppliers of agricultural input and entrepreneurs and all involved in the value chain gain and provide employment to many people and income generation contributing substantially to national development (Teig et al, 2009).

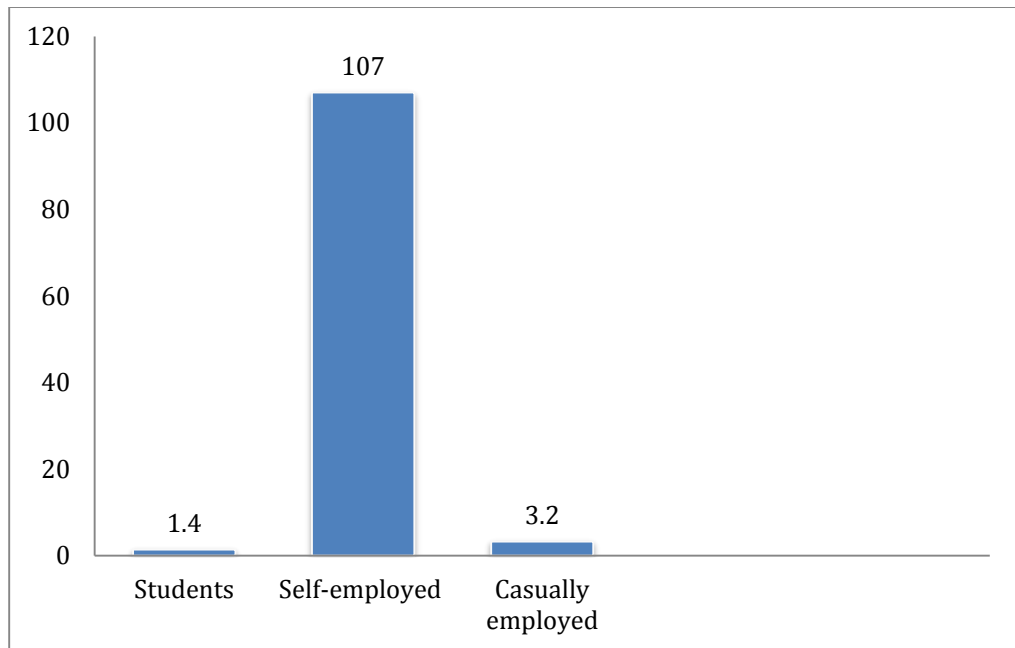


Figure 6: Occupational characteristics

Source: Field data (2015)

Respondents monthly income

Peri-Urban agriculture has been practiced in different economic class. From Figure 7, it has been revealed that majority (46.5%) of the peri-urban farmers had monthly income of 600¢-1000¢, whereas 33 percent respondents earned 200¢-500¢ monthly income. 9.3 percent, 8 percent and 3.2 percent of respondents had an income of less than 200¢, 1100¢-1500¢ and above 1500¢ respectively. The variation of farm income was different from farmer to farmer since there are differences in farmland size, farmer's effort as well as application of technologies (Lynch, Binns & Olofin, 2001).

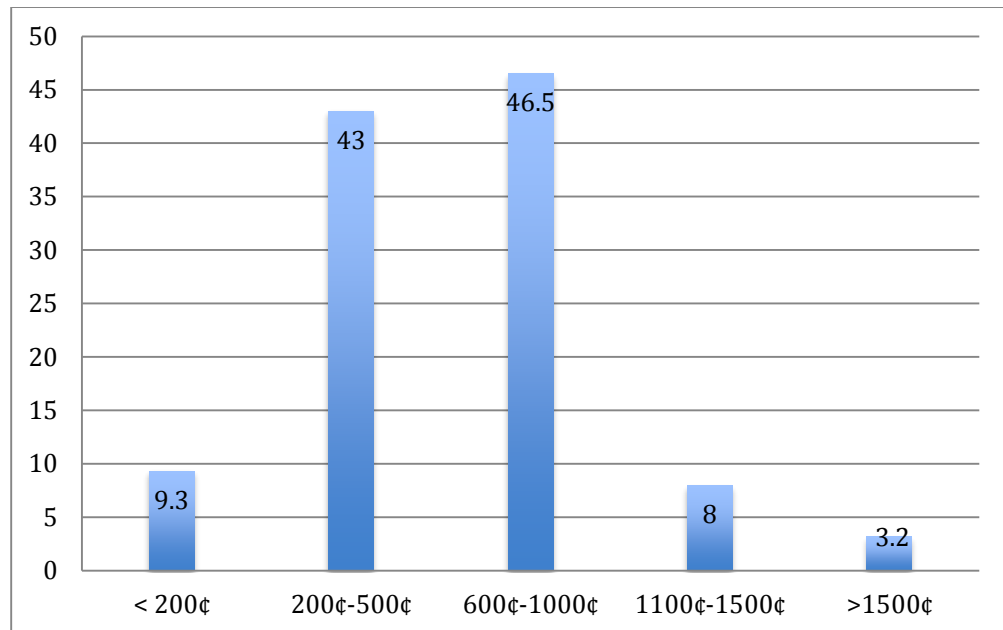


Figure 7: Monthly income of respondents

Source: Field data (2015)

Peri-urban agriculture as a livelihood strategy

Peri-urban farmers indicated that depending on the season and demand for their produce, peri-urban farmers in STMA earn about GH¢650 in the dry season (November to March) and about GH¢400 when there is an abundance in the system. Since the vegetables require lot of water, during the rainy season many of the farmers produce more leading to reduction in the price. Box 1 indicates the benefits some peri-urban farmers derive from peri-urban agriculture as a livelihood strategy.

Box1: Peri-Urban Agriculture as a livelihood strategy

Air force: A 62 year old farmer who owns and cultivates mainly vegetables was a security supervisor when he retired at the Takoradi Senior High School six years ago. His accounts is ‘ I am a pensioner and after working for about 14 years earn an allowance GH¢ 30 monthly. I couldn’t have survived on this income up till now. I can now earn about GH¢600 every month and have been able to acquire a parcel of land. I am able to take care of myself and family from farming.

Ketan Junction: One farmer who is a cleaner and florist with a private floral company also was delighted that he was engaged in peri-urban agriculture. He has been able to employ three more people to assist him on the farm. He explains ‘peri-urban faming keep me and family going. I am able to care for my children education, give employment to others and even my wife who sells the produce from the farm’.

Source: Field data (2015)

Peri-urban agriculture farming characteristics

According to the study findings almost 70 percent (69%) of the farmers interviewed in the Metropolitan Assembly engaged in crop farming while 17 and 14 percent deal in animal and fish farming respectively. The large percentage of farmers in crop farming was attributed to the fact that there is not enough land for them to keep animals and engage in crop farming at the same time, while others claim crop farming is more lucrative than rearing of animals. The average farm size is less than an acre making it difficult for farmers to expand their production. Even though land is not the only factor,

the relative small farm sizes leads to the underutilization of other resource like labour in their production. The farmers live within the communities where the farms are located and the farthest distance is about 3 km.

The main crops cultivated in the peri-urban areas are cabbage, cauliflower, lettuce, carrot, green paper and spring onions. Other vegetables cultivated but not as intense as those listed above include tomatoes, okro, long beans. The availability of water and profits on vegetable production is the main reason why these farmers engage in it. Vegetable farming continues in the peri-urban areas in the rainy seasons, in farm sites like Air force, Airport Ridge, PTC, Esipon, Ketan Junction and Kwesimintsim. Farmers also cultivate some maize, cassava and plantain alongside which are used for subsistence.

On the issue of whether farmers are part of an organisation or group, the study revealed that 40 percent are members of an organized farmer group as compared to the rest who are not. Some of the benefits derived from joining the association are access to farm inputs and credit. The remaining 60 percent do not see any need to join the farmer associations since they do not receive any direct benefit from the association.

Challenges facing peri-urban agriculture practices

Peri-urban agriculture producers are faced with numerous problems during their day-to-day activities. These include land constraints, water accessibility problem (including water pollution), shortage of improved seeds, inadequate access to fertilizer usage, pesticides attack, lack of finance, lack of government support and follow-up, shortage of market, storage problems and transportation problems as well as change in climate condition. Figure 8,

prioritise constraints facing peri-urban farmers in STMA.

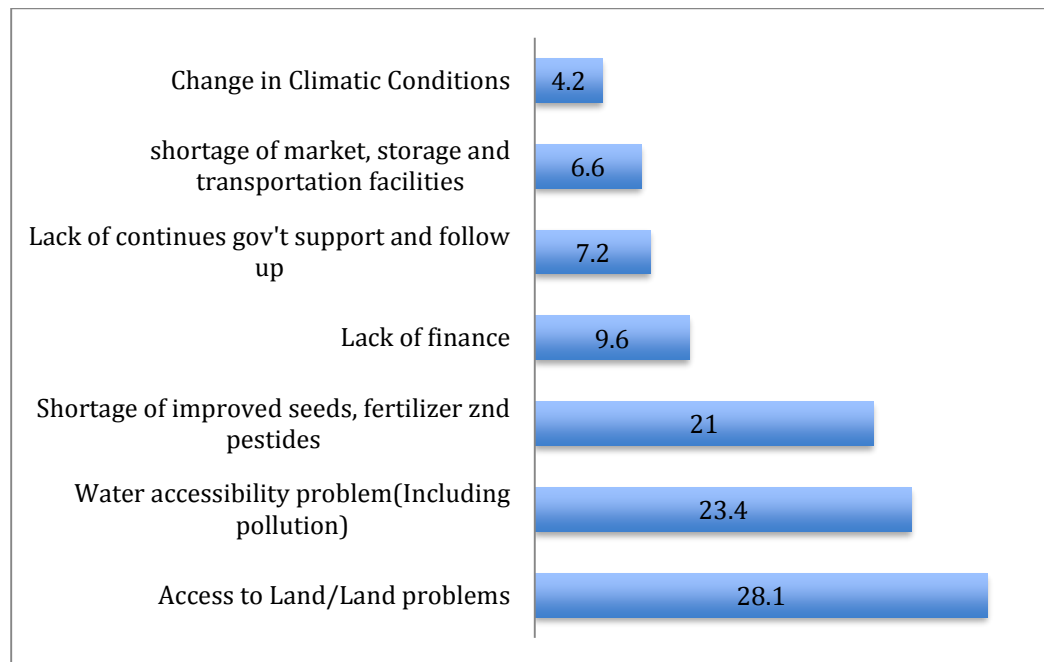


Figure8: Major constraints facing peri-urban agriculture in STMA

Source: Field data (2015)

Access to land/land problems

Empirical evidence presented by Lynch, Binns and Olofin (2001) suggests that peri-urban agricultural activities and livelihoods are being threatened by acute problems of tenure insecurity and encroaching land development. From Figure 9, 28.1% of respondents reported shortage of farmland as the main challenges they face in practicing peri-urban agriculture. The city agricultural office has no recorded data on how much land is used for peri-urban agriculture.



Plate 1: Farming along the airstrip

Source: Field data(2015)

Water accessibility problem (including pollution)

From Figure 8, 23.4 percent of respondents affirmed that water accessibility and water pollution is one of the challenges they are facing. A further disaggregation in Figure 9 indicates that water pollution constitute 45.5 percent, shortage of water is 25.7 percent, and problems regarding to irrigation constitute 6.6 percent respondents, where 22 percent admitted that they did not face any types of problem regarding irrigation.

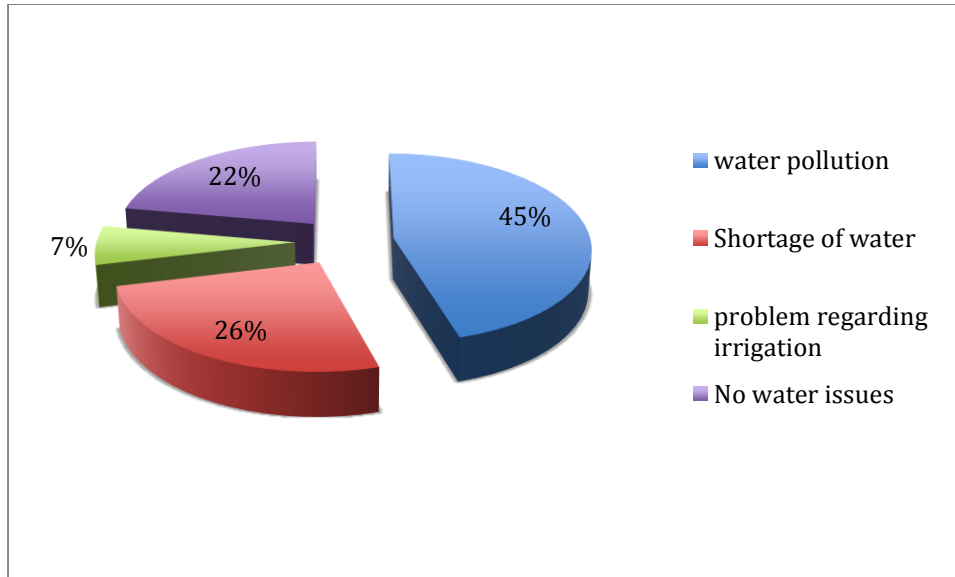


Figure 9: Water accessibility issues

Source: Field data (2015)

Source of water for irrigation

There are different sources of water that are used by peri-urban farmers. As indicated by Baumgartner & Belevi (2001) rainwater is the major source of water used by the peri urban farmers in farming; in the absence of the rainwater they use clean water for irrigation when available, but pipe borne water for irrigation is rare due the cost involved and its unreliability of supply or lack of access. From Figure 10, among the 129 peri-urban farmers the majority 103 respondents were using river water to irrigate their crops. During the data collection it was observed that peri-urban farmers relied on contaminated and untreated water for irrigation (plate 2,3 and 4).

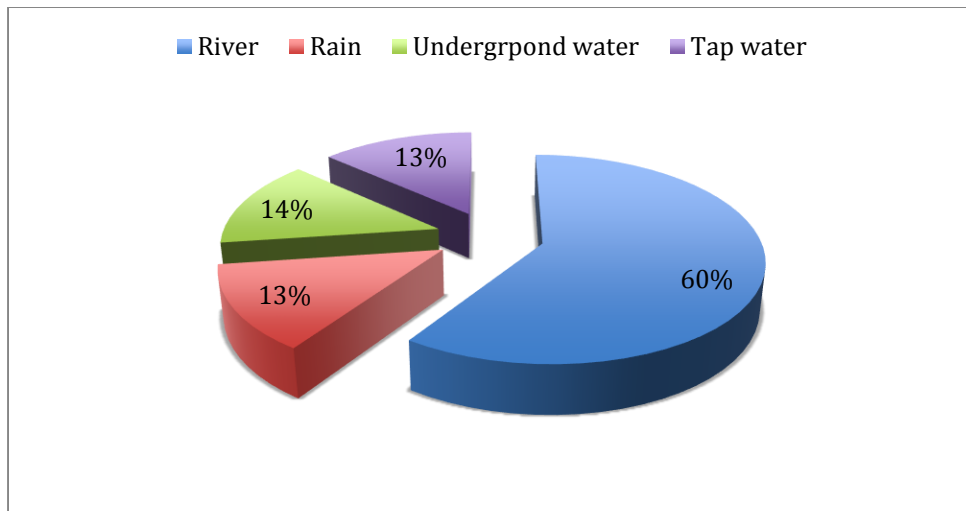


Figure 10: Sources of water for cultivation

Source: Field data (2015)



Plate2: Using contaminated water to irrigate farm lands

Source: Field data(2015)



Plate3: Untreated waste water used in watering farm lands

Source: Source: Field data(2015)



Plate4: Traditional way of harvesting rainwater for irrigation

Source: Source: Field data(2015)

Shortage of improved seeds, fertilizers and pesticides

An inadequate seed, fertilizers and pesticides was ranked as the third (21%) constraints hindering the productivity of peri-urban agriculture (Figure 8). Based on the data obtained, Figure 11 shows that only 44 (34.1%) of respondents had access to enough inputs while 85 (65.9%) of respondents don't have or less access to inputs. These input constraints forces peri-urban farmers to buy improper and expired inputs from market since they do not have any means of getting proper improved inputs.

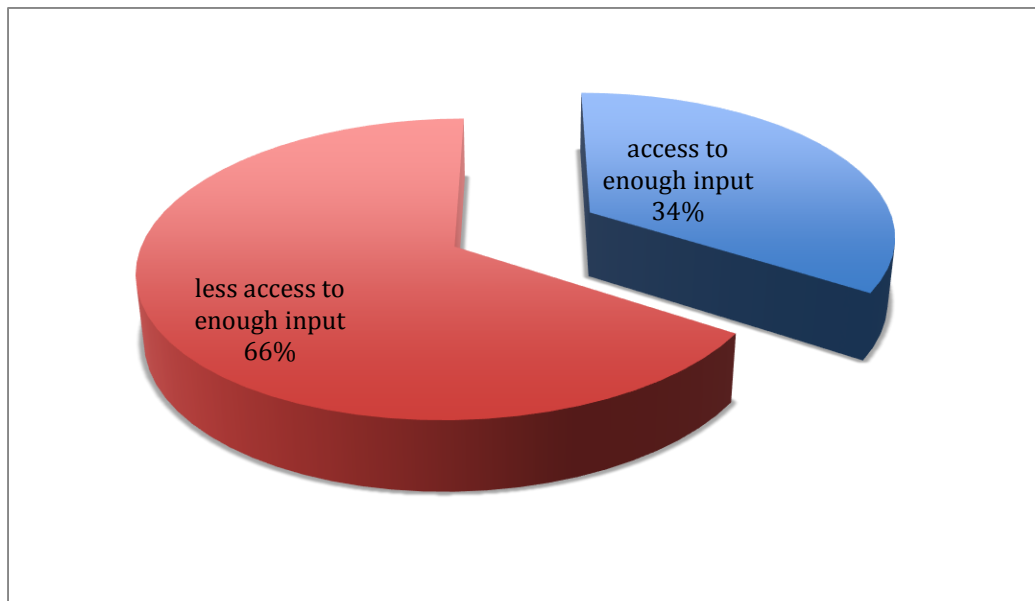


Figure 11: Access to improved seeds, fertilizers and pesticides

Source: Field data (2015)

Source of farm inputs

Table 8 shows the source of farm inputs for peri-urban farmers in STMA. 62.7% source of inputs is from the market, whereas the rest; 18.6%, 3%, 7.7% and 1.5% of respondents receive from extension agents, last year production, from own source and their relatives respectively. This reduces the productivity of peri-urban agricultural products, especially vegetable productions, according to peri-urban farmers.

Table 8: Source of farm input

Respondents source of seed & fertilizer supply	Frequency(n=129)	Percentage
Extension agents	24	18.6
Relatives	2	1.5
Market	81	62.7
Last year production	12	9.3
Own source	10	7.7
Total	129	100.0

Source: Field data (2015)

Lack of finance, support and logistics problems

Other challenges raised by respondents in Figure 9 were lack of finance (9.6%). According to the data obtained through survey, about 41.9% of respondents was reported that they have access to credit service whereas the remaining 55.3% faced problems in accessing credit.

Table 9: Farmers response to access to credit service

Access to credit service	Frequency(n=129)	Percentage
Yes, I get	50	38.8
No, I don't get	71	55.0
I don't need	8	6.2
Total	129	100.0

Source: Field data (2015)

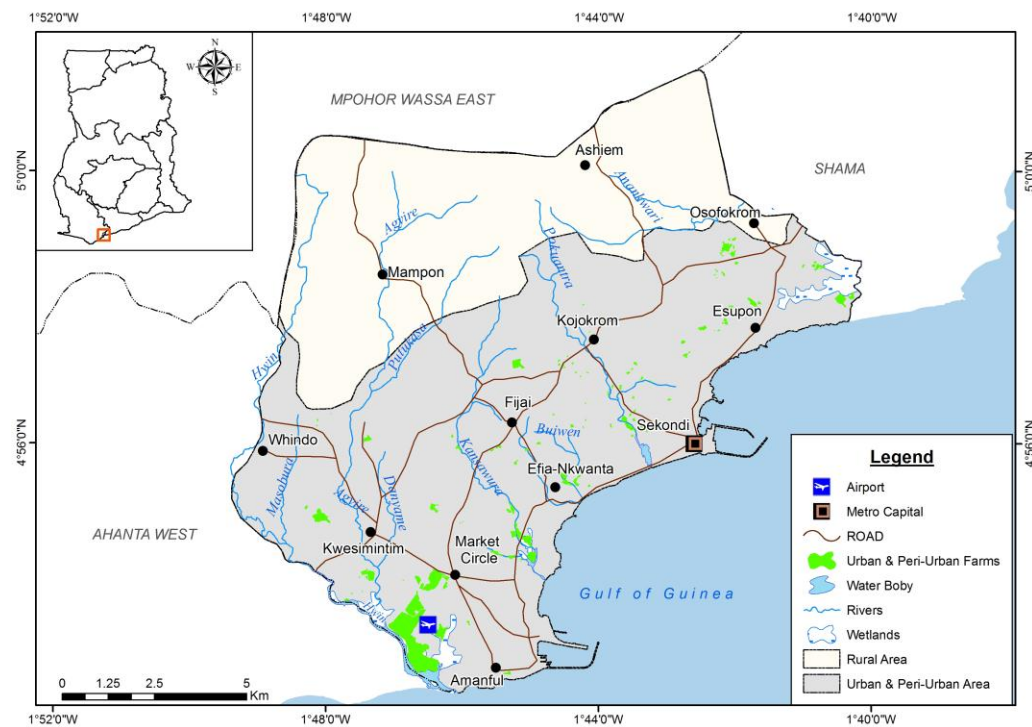


Figure 12: Locating peri-urban agriculture in STMA

Source: Author (2015)

Locating peri-urban agricultural activities

Within the STMA there are small pocket of peri-urban farms (Figure 12), where a considerable amount of vegetables and other crop is produced. These farm sites are located in areas commonly known as the Air Force Strip,

Polytechnic, Airport Ridge, Pioneer Tobacco Company and Kwesimintsim (near the 'Obiri' lotteries building). Except for the larger site at Airport Ridge which is 335m² the total area of the other sites covers about 1 ha or less.

Farm sites at both the Air Force Strip and Airport Ridge are all located on land that belongs to the Ghanaian air force. Here farmers pay a small annual fee for land cultivation. Peri-urban agriculture tends to be carried out on peri-urban land that is not immediately needed or suitable for urban development. Within the STMA areas where major peri-urban agriculture takes place are on undeveloped government lands, family and individual lands. For instance areas within Airport ridge, Kwesimintsim, Airforce, Esiepon, Ketean and Kojokrom. Other places include areas liable to (seasonal) flooding, areas zoned for public open space, road and railway reservations, speculative land (to fetch higher prices for urban development).



Plate 5: Satellite image showing the biggest peri-urban agriculture farm around the Takoradi airport

Source: Google Earth (2015)

Table 10: Characteristics of farm size and area in STMA

ITEM	Size
STMA	157.75km ²
Rural Area	54.28km ²
Urban & Peri-urban Areas	119.93km ²
Farm areas	2.515
Number of farms	133
Minimum size of farm lands	335m ²
Maximum size of farm lands	901615.38m ²

Source: Author(2015)

Institutions and policies influencing peri-urban agriculture

Institutions involved in UPA in STMA

The Town and Country Planning Department, Metro Directorate of Ministry of Food and Agriculture and the Sekondi-Takoradi Metropolitan Assembly are the main institutions involved in the management of peri-urban agriculture practices in the metropolis. These key stakeholders contributed immensely to the success of this study through expert interview. The Ministry of Food and Agriculture (MoFA) through its directorate in STMA remains the primary source of improved farming technology in peri-urban communities. In the STMA, other institutions— both governmental and non-governmental— have a stake in UPA. These include farmer groups, research and academic institutions, and government and non-governmental agencies that play various roles in influencing the practice of peri-urban farming in STMA (Table 11).

Table 11: Institutions involved in UPA in STMA

Categories	Institutions	Role/functions
Farmer Associations/ Groups	Livestock Farmers Association Vegetable Farmers Association	Advocacy for subsidies on input, liaison between farmers and other agencies (Government and NGO), securing group credit for members and negotiating prices of produce
Research/ Academic Institutions	Animal Research Institute Water Research Institute	Research in areas such as improved seeds, fertilizer trials, animal health and soil improvement
Government Agencies	STMAMinistry of Food and Agriculture, Town and Country Planning Environmental Protection Agency, Department of Parks & Gardens	Administration and enforcement of legislations and by-laws, provision of extension services, city planning and beautification.
Non- Governmental Organizations	ActionAid Ghana, CARE International, Ghana Community Action for Development , World Vision Ghana	Advocacy for UPA, provision of credit and agricultural inputs, formation of farmer groups and provision of infrastructure like boreholes, dams and dugouts.

Source Field data(2015)

The policy landscape for peri-urban agriculture in STMA

National, regional and municipal policy frameworks in Ghana provide several potential entry points for promoting greater sustainability of UPA. However, the policy landscape for UPA also suffers from lack of coherence between different policy bodies and government units resulting in, among other adverse effects, diminished land-tenure security for farmers in peri-urban STMA.

The Food and Agricultural Sector Development Policy (FASDEP II) constitutes the current policy framework governing the agricultural sector of the economy, including the sub-sectors of crop and livestock development, fisheries, service delivery, irrigation development, plant protection, agricultural mechanization, access to agricultural inputs, human resource development, youth in agriculture, gender mainstreaming and improved financial services. Some elements of the FASDEP II framework relate specifically to UPA and enjoin urban and peri-urban farmers to take advantage of sub-sector policies, which include strategies for the development of food commodities.

The Medium Term Agriculture Sector Investment Plan (METASIP) 2011–2015 has the component 2.6: Increased Growth in Incomes devoted to urban and peri-urban agriculture. This explains that intensive market-oriented urban farming in open spaces is taking place year-round in Ghana's main cities, Accra, Kumasi, Sekondi-Takoradi and Tamale. It recognizes the numerous benefits of urban and peri-urban agriculture to the Ghanaian economy and acknowledges that production is often associated with health

risks, hence a need for regulatory restrictions on farming with regard to the use of pesticides and polluted water for irrigation.

Section 51–sub-section 3 of the Local Government Act 426 (1993) permits peri- urban farming activities but with prior permit from the district/municipal/metropolitan assemblies. All farming activities (small-scale vegetable and flower gardening excluded) within the STMA metropolis are illegal, unless permission has been granted by the metropolitan authorities, including the metropolitan officer of health. Part of this permission-granting process is to ensure the maintenance of good sanitation in the city. The STMA has no by-laws regulating the cultivation of open spaces in the city, but extensive systems of rearing livestock (cattle, sheep and goats) in the urban and peri-urban areas are prohibited. Offenders whose animals are captured by the metropolitan authorities are required to pay a fee before the animals are released back to them.

Institutional analysis

The Town and Country Planning Department

The department is charged with the preparation of land use plans (structure plans) to direct and guide the growth and the sustainable development of human settlement in the Metropolis. Creating awareness about the need for obtaining planning and development permits as well as the right procedure to use. Assessment of zoning status of lands and proposals of re-zoning where necessary and processing of development/building permit application documents for consideration by the Statutory Planning Committees.

The major tool used to check development is the layout/schemes prepared. Site plans are also prepared to be in line with the schemes. This help to ensure that development conformed to the scheme. The building inspectorate unit is charged to ensure that people comply with this in the Metropolis. The Town and Country Planning Department did indicate that the people are involved in plan preparation and implementation. As required by law, the Department is to publish any scheme twenty-one (21) days for people to comment about it but people do not attend or visit their officers to add their inputs.

Metro Directorate of Ministry of Food and Agriculture

The Metro Directorate is the main institution at the Assembly level in making and implementing agriculture policies. It is therefore mandated to coordinate the day-to-day activities of the Metropolitan Agricultural development unit. Other responsibilities include:

- i. Analysing participation and adoption of appropriate technologies by farmers as well as fisher folks;
- ii. Organizing and participating in all meetings, workshops related to agriculture to clarify MoFA position;
- iii. Liaising with all stakeholders and the public at large on program related to the development of agriculture in the Metropolitan Assembly; and
- iv. Monitoring the performance of all agricultural developments in the metropolis and their impact on food production.

Sekondi-Takoradi Metropolitan Assembly

The Metropolitan Assembly is the main institution in charge of peri-urban agriculture. It comprises of other Decentralized departments, NGO(s), the media, research institutions and farmers among others. From time to time the assembly together with other stakeholders hold workshop and seminars on peri-urban agriculture. The most recent one was the Ghana Multi-stakeholder Forum on UPA. The Multi-stakeholder Forum on UPA was held in 2005 to respond to the need of UPA and seek ways of integrating it into urban policies and planning through stronger participation of key stakeholders. This was organized by the Resource Centres on Urban Agriculture and Food Security (RUAF) in collaboration with the Ministry of Food and Agriculture (MoFA), the Science and Technology Policy Research Institute of CSIR (STEPRI-CSIR), the Food and Agriculture Organisation of the United Nations (FAO) and the International Water Management Institute (IWMI). The main objectives of the forum were to articulate stakeholders interest in UPA, reach a consensus on key issues and make decisions on how to translate decisions into actions. Discussion and decisions at the forum were based on the premise that: UPA will continue to be practiced in major cities and its surroundings as in other African cities because of its contribution to the livelihoods of urban poor and to respond to the increasing demands for its products; The benefits of UPA can be maximized while minimizing the associated health and environmental risks if the practice is institutionalized, regulated and integrated into urban planning agenda.

Key issues pertaining to UPA were discussed. Among them included the human health, environmental quality and urban development implications

of current UPA practices, the types and locations of UPA sites, SWOT analysis was also carried out and major gaps and intervention areas needed to effectively promote the production system.

The benefits derived from peri-urban agriculture from the city authorities clearly show that it should be encouraged. Some of the benefits include providing jobs and / or food, ornamental plants and amenity (managed open space, fresh air) for the peri-urban residents. In addition, if properly carried out, it could also help controlling floods, limit soil erosion, educate urban people about food production, recycle urban waste as well. These are all functions that would otherwise involve long-distance transport. In order to contribute to sustainable city development peri-urban needs to be more than just agriculture that happens to be in or next to built-up areas.

Understanding planning institutions, policy and decision making processes

The main institutions involved in peri-urban agriculture in STMA are the Town and Country Planning Department, the Metropolitan Assembly and the Metro Office of the Ministry of Food and Agriculture. In the Metropolitan Assembly, there is no comprehensive plan or document on peri-urban agriculture. It is however mentioned in part in one of the byelaws of the STMA of 2001 that support backyard farming. The byelaw states:

'No person shall grow crops at a place other than on land within his/her premises unless he/she has registered with the Medical Officer of Health furnishing his name and address and the description of the site where crops are grown'.

However, open-space farming requires permission from the Medical Officer of Health of the Assembly. This is to help ensure that the land is not polluted and prevent the consumption of contaminated food. The bye laws of the STMA do not support or prevent open space farming since its bye laws are not enforced.

Even though peri-urban farming is seen as an ‘informal’ activity, the Metropolitan Assembly indicated that their task force team still go round to inspect the activities of peri-urban farmers from time to time. It is therefore clear that, the bye laws of STMA is not clear enough to ban or promote peri-urban agriculture but to ensure that they maintain good sanitary conditions in the Metropolitan Assembly.

Understanding spatial land use planning practices

The main institution responsible for the preparation, implementation and monitoring of land use planning in the Metropolitan Assembly and the country as a whole is the Town and Country Planning Department. Land use (Layout) Plan or detailed planning scheme, zoning and site plans are the main tools used for spatial land use planning. The Land use Plan indicates the various uses that the land can be put to. Zoning also gives the Assembly the opportunity to determine the use of every land.

However, peri-urban agriculture is not recognized as a land use category in the country. It is supposed to be captured as part of the major land use that is agriculture. This is one major hindrance for integrating it into city development. Even though some form of guidelines exist to facilitate land development in the study area, there is none on peri-urban agriculture. The

Town and Country Planning Department has provided some guidelines to be followed when developing a parcel of land for residential, commercial, industrial and education but this is silent on peri-urban agriculture.

Recognizing and permitting peri-urban agriculture

Peri-urban agriculture is considered only in so far as such planning includes some kind of 'green belt' concept. Apart from allocating such 'buffer' zones, planners tend to exclude agriculture from their terms of reference. Peri-urban agriculture is not a distinct land use in the Metropolis areas but considered as part of Agriculture land use. Peri-urban agriculture activities in the Metropolitan Assembly according to officials of Ministry of Foods and Agriculture, Metropolitan Assembly and the Town and town and Country Planning Department are an informal activity. This is because it is not regulated by these institutions and monitored by them.

In reality, planners and other officials have no constructive ideas about agricultural activities within and around the city. Some officials are of the view that, due to high demand for lands, coupled with usage of waste water in irrigation of farm lands, peri-urban farming should not be allowed. They consider gardening as 'recreation', animal husbandry as 'pets' and farms around the city as rural activities and officials who even recognize peri-urban agriculture tend to see it as happening in future peri-urban areas.

CHAPTER FIVE

SUMMARY CONCLUSION AND RECOMMENDATIONS

Introduction

This chapter reflects on the entire study and also seeks to summarise issues regarding how peri-urban agriculture could be integrated into the economy of STMA. The chapter further provides some conclusions from the findings, as well as recommendations to improve peri-urban agriculture in the metropolis. The chapter ends with areas suggested for further research, and then the contributions to knowledge.

Summary of research process

In achieving the main thrust of this research; which was to assess how peri-urban agriculture can be integrated into the economy of Sekondi-Takoradi Metropolis; a triangulation of both quantitative and qualitative methods was used in order to give the research statistical and conceptual significance. Interview guide and direct observation were employed to collect the data. The primary sampling target were peri-urban agriculture farmers (129 respondents), followed by other Key informants (3 institutions) who are stakeholders of peri-urban farming.

Main findings of the study

Based on the results and discussion, the main findings of the study are summarised as follows:

Demographic characteristics of farmers

- Over 80 percent of respondents in the Metropolis was in the economically active working group. As it was noted that it is a male dominated activity. In terms of marital status 65 percent of the respondents are married. About 42 percent of the respondent is migrants who engage in peri-urban farming which is a good source of livelihood for both internal and external migrants.
- Again, 68 percent of the respondents has some kind of education. There is 3 percent in tertiary institutions engaged in peri-urban agriculture activity which is very encouraging looking at the fact that it is perceived to be an activity for those who are school drop outs.

Employment and occupational profile of farmers

- Agriculture is the main source of employment for 77 percent of the respondents. Depending on the season and demand for their produce, peri-urban farmers in STMA earn about GH¢650 in the dry season and about GH¢400 when there is abundance of remain in the system. This is therefore a major source of livelihood for peri-urban farmers and helps to reduce the incidence of poverty among some of the rural and urban poor.

Peri-urban agriculture farming characteristics

- Sixty nine percent of the farmers interviewed in the Metropolitan Assembly is engaged in crop farming; while 17 percent and 14 percent

represent animal and fish farming respectively. The high number of crop farming was attributed to the fact that there is not enough land for them to keep animals and engage in crop farming at the same time. Furthermore, there are no lands designated for urban and peri-urban agriculture in the study areas.

- It was discovered that the average farm size is less than an acre making it difficult for farmers to expand their production. Farmers use watering cans to carry water from a water source which mostly comprise of hand dugouts, streams and pipe system. There exist farmer organization/groups in the various sites studied even though some are not functioning now. The major constraints affecting the operations of farmers are crop disease, lack of input, water, credit and marketing.

Understanding planning institutions, policy and decision making process

- In the Metropolitan Assembly, there is no comprehensive plan or document on peri-urban Agriculture. It was confirmed that however, there is no byelaw on peri-urban agriculture in the Metropolis. Guidelines on peri-urban agriculture in Sekondi and Takoradi have been prepared and presented to policy makers yet still much attention have not given to it.

Recognizing and permitting peri-urban agriculture

- Peri-urban agriculture activities in the Metropolitan Assembly according to officials of Ministry of Foods and Agriculture, Metropolitan Assemblies and the Town and Country Planning Department is an

‘informal’ ‘activity. This is because it is not regulated by these institutions and monitored by them. This is considered only in as far as such planning includes some kind of 'green belt' concept. Apart from earmarking such 'buffer' zones, urban planners tend to exclude agriculture from their terms of reference.

Understanding spatial land use planning practices

Land use Plan or detailed planning scheme, zoning and site plans are the main tools used for spatial land use planning. The Land use Plan indicates the various uses that the land can be put to. Zoning also gives the Assembly the opportunity to determine the use of every land. However, peri-urban agriculture is not recognized as a land use category.

Integrating peri-urban agriculture into city development

- The Land use plans or schemes that exist do not include peri-urban agriculture as a land use category since it is still seen as a rural activity. Further, the Assembly do not own lands that it can make available to the urban and rural farmers to use. It was discovered that all the major farm sites are government lands which are not sustainable or belongs to families and other individuals. Although peri-urban agriculture may be well known by policymakers and planners, in many cases this knowledge is not evidenced in recognizing peri-urban agriculture as an important element of the Metropolitan economy and land-use system.

Conclusions

Based on the results and discussion as well as the key findings the following conclusions were drawn:

- The study has demonstrated that peri-urban agriculture creates opportunities for poor people to generate income and improve livelihood security; at the same time, these activities can adversely affect existing livelihoods, particularly on the very poor.
- In that regard, peri-urban agriculture should be incorporated into the planning process at an early stage. There is a growing realization that the design of the scarce open space in the country can (and must) be different. Setting up peri-urban agriculture is one thing, but guaranteeing peri-urban agriculture in a dynamic surrounding such as the city is another. The availability of sufficient land must be secured for an extended period of time. It is therefore clear from the study that adoption of policies by Planners is key to the realization of peri-urban food security and sustainable city development.
- In order to realise the full potential of peri-urban agriculture, there is the need to develop a policy and institutional framework for the sector. This would enable urban farmers unlock critical technical and financial support services. Also, urban agriculture would be carried out in designated and safe places. This would be mutually beneficial to the farmer as well as the unsuspecting consumer who would be guaranteed of safe produce.
- All five research objectives were adequately answered

Recommendations

Employment and occupational profile of farmers

Peri-urban agriculture however is not the sole solution to poverty alleviation and economic empowerment for the urban and rural poor but is rather complementing rural and urban agriculture. There is therefore the need to link and integrate peri-urban agricultural development activities with other policies and strategies, as well as a comprehensive planning in the future. Town and Country Planning Department, the Metropolitan Assembly and the Metro Office of the Ministry of Food and Agriculture should give specific assistance to food insecure households engaged in peri-urban agriculture activities, including food production, processing and distribution, to help in achieving a more sustainable livelihood.

Peri-Urban agriculture farming characteristics

There is the need to improve access to input and output markets for smallholder farmers. Connecting farmers to markets through rural feeder roads, credit institutions, information and communication technologies, and vertical coordination along the food supply chain is essential to reducing farmers' risks and marketing costs. The private sector, supported by friendly government policies, can play a leading role in investments in value chains.

Quality control along the entire food chain from production to consumption is essential so that urban consumers can have access to safe and healthy foods. But ensuring a better quality of peri-urban agriculture products will also help producers obtain a better price from the sale of their production.

The organization of peri-urban farmer associations is a prerequisite to the improvement of urban agriculture. A participatory analysis of local constraints and opportunities is needed as the basis for an interdisciplinary approach to the design and implementation of required assistance.

The From Seed to Table (FStT) programme needs to be introduced and intensified in STMA and Ghana as a whole. From Seed to Table (FStT) is a major 3-year initiative intended to encourage urban and peri-urban farmer groups to transform their local production systems, to engage in value-adding activities and establish innovative short marketing channels and to enhance the capacities of NGOs to support them effectively in such activities. The FStT programme also facilitate local policy making and innovative financing in support of small-scale commercial urban agriculture. FStT is coordinated by the RUAF Foundation and implemented by 7 RUAF network partners in cooperation with local government, NGOs and universities. This will help improve the production and marketing of vegetables, including direct sale to restaurants and at farmer kiosks.

Understanding planning institutions, policy and decision making process

Policy makers should be aware of the benefits of peri-urban and should encourage collaboration between practitioners and researchers, and also support peri-urban farmers to continue producing safe and nutrient-rich products for both home consumption and city markets. Metropolitan Assembly and Town and Country Planning Department should ensure that the needs and benefits of peri-urban agriculture are taken into account in physical planning (land tenure, water availability, drainage). Metropolitan Assembly and Town

and Country Planning Department should investigate whether peri-urban agriculture is a viable strategy to improve food security among the urban poor who are not cultivating, and advise municipalities accordingly.

Coordination among the various sectors involved should be encouraged from the urban, local level up to municipalities and the national level. Moreover, all sectors, as well as representatives of the producers themselves, should participate in policy research and formulation. It is therefore important for the planning institutions, policy and decision makers to have knowledge of some key issues to formulate a comprehensive plan. This includes knowledge:

- i) of who wants to undertake peri-urban agriculture and why;
- ii) of where people want to undertake peri-urban agriculture and why;
- iii) of what people want to grow and why;
- v) of the potential negative and positive environmental impacts of peri-urban agriculture,
- v) of the constraints on urban producers and how best to mitigate them

Recognizing and permitting urban agriculture

The interdisciplinary approach should be facilitated by Metropolitan Assembly who should encourage collaboration between the various sectors and stakeholders involved (research institutions, agronomists, nutritionists, health specialists, post-harvest specialists, home-economists, consumer organisations) in order to better address the needs of both small-scale peri-urban producers and peri-urban consumers. For instance the presence of a working group in other Metropolitan /Municipal area will go a long way to

help recognize peri-urban agriculture activities since various Departments and organizations are involved. Without affordable land, there will be no space for urban agriculture. City authorities and entrepreneurs must make clear agreements concerning land, including price and availability as well as issues such as easement. Entrepreneurs can play a role in the management of green areas in the city.

Understanding spatial land use planning practices

Metropolitan planners will also need to focus attention on strategies to promote physical activity. Urban residents need to be encouraged to exercise, both through promoting healthier environments in which to do so and reinforcing the positive health benefits of regular exercise. These actions should be combined with educational campaigns and community activities to advocate exercise.

In terms of physical planning, peri urban agriculture should not result in agricultural land becoming part of residential and commercial land uses. It is also important to reorient the sense of socio organization in the area of study, in order to achieve an integrated city, which is habitable and sustainable, by organizing agricultural activities in the City.

Research limitations and areas for further research

The major limitation of this research project is inherent to the case study approach and related to the generalizability of the findings to other peri-urban and urban areas of Ghana, or even other African countries. The nature of the research itself involves a dynamic and complex peri-urban land tenure

situation where the rules, systems and structures are always changing, making it difficult to generalize the findings to peri-urban and urban contexts of Ghana.

Hence, there is a need to extend the findings of this research either by way of a large scale survey or by replicating the present research in other major urban areas of Ghana, in order to be able to make generalized statements about the findings. Moreover, each policy implication and recommended action has to be further researched and discussed with all key stakeholders and should be tested in a small number of localities or pilot projects before actual implementation.

The following areas of further research are proposed;

Peri-urban agriculture does not only impacts on urban dwellers, but could also potentially impact on rural dwellers, particularly rural farmers. How could beneficial relationships between urban and rural agriculture be optimized?

Currently the two interlinked areas that need research are; mapping and allocation of land for peri urban agriculture and access to credit and finance by urban and peri-urban farmers.

REFERENCE

- Adam, A. G. (2014). Informal settlements in the peri-urban areas of Bahir Dar, Ethiopia: An Institutional Analysis. *Habitat International*, 43, 90-97.
- Adell, G. (1999) *Theories and models of the peri-urban interface: A changing conceptual landscape*, London: University College London.
- Adesina A, (2007). *Socio-spatial transformations and the urban fringe landscape in developing countries*, Ibadan: Ibadan University Press.
- Afrane, Y.A., Klinkenberg, E., Drechsel, P., Owusu-Daaku, K., Garms, R., and Kruppa, T. (2004). Does irrigated urban agriculture influence the transmission of malaria in the city of Kumasi, Ghana ? *Acta Trop.* 89 :125–134.
DOI : 10.1016/j.actatropica.2003.06.001
- Allen, A. (2003). Environmental planning and management of the Peri-Urban Interface (PUI): Perspectives on an emerging field, *Environment and Urbanization*,15(1), 135–147.
- Alterman, R. (2007). Much more than land assembly land readjustment for the supply of urban public services, in: Hong, Y. H. & Needham, B. (eds.) *Analyzing Land Readjustment: Economics, Law and Collective Action*, .Cambridge: Lincoln Institute for Land Policy.
- Altieri, M. A. (1999). The greening of the “barrios”: Urban agriculture for food security in Cuba, *Agriculture and Human*, 16, 131–140.
- Anikwe, M. A. N. & Nwobodo, K. C. A. (2002). Long term effect of municipal waste disposal on soil properties and productivity of sites

- used for urban agriculture in Abakaliki, Nigeria, *Bioresource Technology*, 83(3), 241–50.
- Anyane, S. La. (1963). Vegetable gardening in Accra. *The Ghana Farmer* 1(6): 228-230.
- Armar-Klimesu, M. (2000). Urban agriculture and food security, nutrition and health, In *Growing Cities Growing Food on the policy agenda*. pp. 99–117. Available at: <http://www.ruaf.org/sites/default/files/Theme4.PDF> [Accessed September 30, 2014].
- Asomani-Boateng, R. (2002). Planning and managing urban organic solid waste in an African city: Linking organic solid waste composting to urban cultivation in Accra, Ghana. Ph.D. Thesis, School of Planning, University of Waterloo, Ontario, Canada.
- Atamanov, A., & van den Berg, M. (2012). Heterogeneous Effects of International Migration and Remittances on Crop Income: Evidence from the Kyrgyz Republic. *World Development*, 40(3), 620-630.
- Attua, E. M. & Fisher, J. B. (2011). Historical and future land cover change in a municipality of Ghana, *Earth Interaction*, 15 (9), 18 – 26.
- Bailkey, M., Wilbers, J. & van Veenhuizen, R., (2007). Building communities through urban agriculture, *Urban Agriculture Magazine* 18, July, Available at: <http://www.ruaf.org/node/101>.
- Balmer, K., Gill, J. K., Miller, J., Peterason, M., Rhoads, A., Rosenbloom, P., & Wall, T. (2005). *The diggable city: Making urban agriculture a planning priority*. (K. Balmer, J. K. Gill, J. miller, M. Peterason, A. Rhoads, P. Rosenbloom, & T. Wall, Eds.), 1–102.

- Baumgartner, B. & Belevi, H. (2001). A systematic overview of urban agriculture in developing countries, *EAWAG/SANDEC*, Dübendorf, (September).
- Beckie, M. & Bogdan, E. (2010). Planting roots: Urban agriculture for senior immigrants, *Journal of Agriculture, Food Systems, and Community Development*, 1.
- Bon, H., Parrot, L. & Moustier, P. (2010). Sustainable urban agriculture in developing countries: A review, *Sustainable Agriculture*, 30, 21–32, Available at: <http://www.springerlink.com/index/h5720nt116951k17.pdf> [Accessed November 2, 2014].
- Brock, B. & Foeken, D. (2006). Urban horticulture for a better environment: A case study of Cotonou, Benin, *Habitat International*, 30(3), 558–578. Available at: <http://linkinghub.elsevier.com/retrieve/pii/S0197397505000214> [Accessed September 23, 2014].
- Buxton, M. (2007). *Change in Peri-urban Australia: Implications for land use policies*, Sydney: Department of Environment and Heritage Publishing Unit
- Carman, J. M. (2000). Consumer perceptions of service quality: An assessment of the SERVQUAL dimensions. *Journal of Retailing*, 66(1), 33-55.
- Chancellor, F. (2004). Gender, water and urban agriculture. *Urban Agriculture Magazine* 12, 18-19.
- Chiesura, A. (2004). The role of urban parks for the sustainable city, *Landscape and Urban Planning*, 68(1), 129–138, available at:

<http://linkinghub.elsevier.com/retrieve/pii/S0169204603001865>

[Accessed February 15, 2015].

Cooperative Housing Foundation International, (CHF International) (2011).

Sekondi- Takoradi poverty map: A guide to urban poverty reduction in Sekondi-Takoradi, 30-31.

Crush, J., Hovorka, A. & Daniel, T. (2010). *Urban food production and*

household food security in southern African cities, (4), available at:

http://queensu.ca/samp/afsun/files/AFSUN_4.pdf [Accessed September 30, 2014].

Danso, G., Keraitia B. & Afrane, Y (2002). *Farming systems in urban*

agriculture, Accra, Ghana., consultancy report submitted to FAO:

FAO-Ghana office via IWMI, Ghana-office.

Darke P, Shanks G & Broadbent M (1998) „Successfully completing case

study research: combining rigour, relevance and pragmatism“

Information Systems Journal 8, pp. 273-289

De Boeck, F., Cassiman, A. & Van Wolputte, S. (2009). *Recentring the city:*

An anthropology of secondary cities in Africa.

Deelstra, T. & Girardet, H. (2004). *Urban agriculture and sustainable cities:*

News from the field, the 26th Bienale De São Paulo, Hong Kong Press (15).

Department of Geography and Regional Planning, UCC (2014).

Doan, P. & Oduro, C. Y. (2011). *Patterns of population growth in peri-urban*

Accra, Ghana, *International Journal of Urban and Regional Research*.

DOI:10.1111/j.1468-2427.2011.01075.x.

- Drakakis-Smith, D., Bowyer-Bower, T. & Tevera, D. (1995). Urban poverty and urban agriculture: An overview of the linkages in Harare. *Habitat International*, 19(2), 183– 193. Available at: <http://linkinghub.elsevier.com/retrieve/pii/019739759400065A>.
- Drescher, A. W. & Holmer, R. J. (eds.) (2007). *Beyond project border lines: The Asia Urbs project*. GIS based Urban environmental planning and food security project. APT Reports, 16. University of Freiburg, Institute for Physical Geography
- Drescher, A.W. (2001). The German allotment system - A Model for food security and poverty alleviation for the southern African situation? In: FAO (2001) *proceedings of the expert meeting on urban and periurban horticulture in Southern Africa*, Stellenbosch, January, 159-167. On-line: <http://www.cityfarmer.org/germanAllot.html>
- Durand-Lasserve, A. (2003). Land tenure, property system reforms and emerging urban land markets in sub-Saharan Africa., in Jones, G. A. (ed.) *Urban Land Markets in Transition*, Lincoln: Lincoln Institute of Land Policy
- Dutta, V. (2012). Land use dynamics and peri-urban growth characteristics reflections on master plan and urban suitability from a sprawling North Indian City, *Environment and Urbanization ASIA*, 3(2), 277-301. <http://dx.doi.org/10.1177/0975425312473226>
- Ebert, F. (2000). *Making a future for cities: Development policy in the urban century*, New York: Federal Ministry for Economic Cooperation and Development, US, Press and Public Relations.

- Egziabher, A. G. (1994). Urban farming, cooperatives, and the urban poor in Addis Ababa, in *Growing cities, growing food, urban agriculture on the policy agenda*. Ottawa: IDRC
- Farvacque-Vitkovic, C., Raghunath, M., Eghoff, C., Boakye, C. (2008). Development of the cities of Ghana: Challenges, priorities and tools' *Africa Region Working Paper Series* (110), London: The World Bank.
- Foeken, D. & Mwangi, A. (2000). Increasing food security through urban farming in Nairobi, in Hovorka et al. (eds). *Women feeding cities: Mainstreaming gender in urban agriculture and food security*, London: Practical Action Publishing, 143- 150.
- Food and Agriculture Organization (2008). *Soaring food prices: Facts, perspectives, impacts and actions required*, background paper for the High-Level conference on World Food Security, June.
- Foster, V., Briceño-Garmendia, C., World Bank., & Africa Infrastructure Country Diagnostic. (2010). *Africa's infrastructure: A time for transformation*. Washington, DC: Agence Française de Développement.
- Freed- Taylor, M. (1994). Ethical considerations in European cross-national research *International Social Science Journal*, (142), 523-532
- Garland, A. (2008). *Managing urban growth* The Woodrow Wilson International Center for Scholars. Washington, DC: The Woodrow Wilson Center Press,
- Gerrard, A. (2010). *Urban agriculture diversity, Britain: Building Resilience through International Experiences*, 1–11.

- Ghana Shared Growth and Development Agenda (GSGDA) (2010): Costing Framework (2010) *National Development Planning Commission*.
- Ghana Statistical Service (2010). *Ghana Living Standards Survey Report of the Fifth Round*, Accra: Ghana Statistical Service.
- Ghana Statistical Service, (2000a). Poverty trends in Ghana in the 1990's, Accra: Ghana Statistical Service.
- Ghana Statistical Service, (2007). *Patterns and trends of poverty in Ghana-1991-2006*, Accra: Ghana Statistical Service.
- Ghana Statistical Services, (2000b) Population and Housing Census: Summary Report of Final Results," Accra, Ghana, 62 pages, 2000.
- Google Earth (2015)
- GoT, Z, (2006). The National Livestock Policy' Government Press, Dar Es Salaam.
- Government of Swaziland (1997). The Draft Peri-Urban Growth Policy, 1997, Retrieved on 09/08/2010 from http://www.ecs.co.sz/periurban/pup_periurban_policy.htm
- Hansen, E. (1987). National food policies and organization in Ghana. The State and Agriculture in Africa. T. Mkandire & N. Bourenane (Eds.) Senegal. Codesria Book Series London.
- Heilig, G. K., (2002), The Multifunctional Use of Landscapes– Some thoughts on the diversity of land use in rural areas of Europe; Paper presented at 2nd Expert meeting on European Land Use Scenarios, European Environmental Agency, November 25-26, 2005, Copenhagen, Denmark
- Hewitt, M. (1989). Defining "rural" Areas: Impact on Health Care Policy and

Research. Health Program, Office of Technology Assessment,
Congress of the United States, Washington, DC

Hoekstra, F. (2010.) Urban agriculture in Freetown: Status, opportunities and
constraints - Policy Narrative. RUAF-IDRC-CPWF, Freetown.

Hogrewe, W., Joyce, S. and Perez, E. (2003).The Unique Challenges of
Improving Peri-Urban Sanitation. WASH Technical Report No. 86. p.
69.

Holmer, R.J. Drescher, A.B., (2005). Building food-secure neighbourhoods:
the role of allotment gardens. Urban Agriculture Magazine, 15, 19-20.

<http://stma.ghanadistricts.gov.gh>

<http://www.ruaf.org/topics/urban-aquaculture>

Huang, B, 2006. Environmental assessment of small-scale vegetable farming
systems in peri-urban areas of the Yangtze River Delta Region,
China. *Agriculture, Ecosystems & Environment*, 112(4), pp.391–402.

Huang, J. (2006). “The Nature of Distortions to Agricultural Incentives in
China and Implications of WTO Accession,” *World Bank Economic
Review* 18(1): 59-84.

Hubbard, M. & Onumah, G., (2001). Improving urban food supply and
distribution in developing countries: the role of city authorities. *Habitat
International*, 25(3), pp.431–446. Available at:
<http://linkinghub.elsevier.com/retrieve/pii/S0197397501000194>.

Hungwe, C. (2006). Urban agriculture as a survival strategy: An analysis of
the activities of Bulawayo and Gweru urban farmers, Zimbabwe. From
<http://www.cityfarmer.org/ZimbabweSecurity.htm#security> (Retrieved
24 January, 2015).

- Iacono J, Brown A and Holtham C, (2009) „Research Methods – A Case Example of Participant Observation“ Proceedings of the 8th European Conference in Research Methods for Business and Management (ECRM).
- Iaquinta, D. & Drescher, A. (2000). *Defining peri-urban: Understanding rural-urban linkages and their connection to institutional contexts*, presented at the Tenth World Congress, IRSA, Rio, August 1.
- Jan, A. (2000). Land Resources Management Programme, (LRMP). Study Report on Operationalising the New Land Acts. Ardhi House Dar Es Salaam.
- Johnson, J.H. (1974) *Suburban Growth, Geographical Process at the Edge of the Western City*, Aberdeen: Aberdeen University Press.
- Krasny, M. E., & Doyle, R. (2002). Participatory Approaches to Program Development and Engaging Youth in Research: The Case of an InterGenerational Urban Community Gardening Program. *journal of extension*, 40(5), 1–16.
- Kutiwa, S., Boon, E. & Devuy, D. (2010). Urban agriculture in low income households of Harare: n adaptive response to economic crisis, *Journal of Human Ecology*, 32(2), 85–96.
- Lee-Smith, D. (2010). Cities feeding people: An up-date on urban agriculture in equatorial Africa. *Environ. Urban*, 22.
- Liu, Y. & Xu, W. (2008). Interaction mechanism between sustainable development of urban agriculture and increase of peasants' income. *China Population, Resources and Environment*, 18(4), 90–93.

Available at:

http://d.g.wanfangdata.com.cn/Periodical_zgrkzyyhj200804017.aspx.

Lynch, K., Binns, T. & Olofin, E. (2001). *Urban agriculture under threat: The land security question in Kano, Nigeria.* , 18(3), 159–171

Macpherson, I., Brooker, R., & Ainsworth, P. (2000). Case study in the contemporary world of research: Using notions of purpose, place, process and product to develop some principles for practice. *International Journal of Social Research Methodology*, 3(1), 49-61.

Manu, A., Twumasi Y. A. & Coleman T. L. (2006). *Is It the result of global warming or urbanization? The rise in air temperature in two cities in Ghana. Promoting Land Administration and Good Governance 5th FIG Regional Conference, Accra, Ghana: 1 - 4.*

Masakazu, I. (2003). *Urbanization, urban environment and land use: Challenges and opportunities*, London: Institute for Global Environmental Strategies.

Maxwell, D., Levin C., Amar-Klemesu M, Ruel M, Morris S and Ahiadeke C. (2000). *Urban livelihoods and food and nutrition security in Greater Accra, Ghana, Research Report 112*, Washington, D. C: International Food Policy Research Institute,.

Mbibaa, B. & Huchzermeyerb, M. (2002). Contentious development: Peri-urban studies in sub-Saharan Africa, *Progress in Development Studies*, 2 (2), 113–131.

Michael K, (1978).The Integration of Agriculture in Urban Policies. In Bakker N, Dubbeling M et al, edited. *Growing Cities Growing Food: Urban Agriculture on the Policy Agenda*, DES, Germany. Thematic

- Michelle, K., McGinn, R. & Bosacki, S. (2004). Research ethics and practitioners: Concerns and strategies from novice researchers engaged in graduate education, *Forum: Qualitative Social Research*, 17-25.
- Mougeot, J. A. (2000). Urban Agriculture, Definition, Presence, Potentials and Risks and Policy Challenges. IDRC, Cities Feeding People Series. Report 31
- Müller-Jökel, R. (2004). Land readjustment – A win-win-strategy for sustainable urban development, *Spatial Planning for Sustainable Development – Policies and Tools: FIG Working Week 2004*. Athens, Greece, May 22-27.
- Mutiara, F. (2008). *Managing Asia's rapid urbanisation for social progress*. Indonesia, 6th Hitachi Young Leaders Initiative.
- Narain, V. & Nischal, S. (2007). The Peri-urban interface in Shahpur Khurd and Karnera, *India Journal of Environment and Urbanization*, 19, 261-273.
- National Development Planning Commission, (2005). *Growth and poverty reduction strategy (GPRS II): 2006 – 2009*, Accra: Government of Ghana
- Nsiah-Gyabaah, K. (2000). *Characteristics of peri-urban villages*, paper presented at Final Workshop of Kumasi Natural Resources Management Project (R6799), Kumasi, February 9-11.
- Nugent, R. (2000). The impact of urban agriculture on the household and local economies, in *Growing cities growing food on the policy agenda*, 67–97.

- Obosu-Mensah, K (1999). Food production in urban areas. A study of urban agriculture in Accra, Ghana. Ashgate publishing, UK pp. 227.
- Obuobie, E, Drechsel, P, Danso, G and Rashid-Sally (2004). Gender in open-space irrigated urban vegetable farming in Ghana. *Urban Agriculture magazine* 12, 13- 15
- Obuobie, E, Keraita, B, Danso, G, Amoah, P, Cofie, O, Rashid-Sally, L and Drechsel, P (2006). Irrigated urban vegetable production in Ghana. Characteristics, benefits and risks. City farmer, Canada.
- Obuobie, E., Keraita, B., Danso, G., Amoah, P., Cofie, O.O., Raschid-Sally, L. & Drechsel, P. (2006). Integrated urban vegetable production in Ghana: Characteristics, benefits and risks. *IMWIRUAF-CPWF*, Accra: IMWI.
- OECD (2007), “OECD Contribution to the United Nations Commission on Sustainable Development 15: Energy for Sustainable Development”, www.oecd.org/dataoecd/6/8/38509686.pdf
- Olima, Washington H. A. (2003). *Urbanisation and Housing challenges, cities in Africa*, Conference Rapporteur’s report, Organisation for Economic Co-operation and Development (OECD),
- Pasquini, M.W. (2006). The use of town refuse ash in urban agriculture around Jos, Nigeria: Health and environmental risks, *The Science of the Total Environment*, 354(1), 43–59. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/16376696> [Accessed July 17, 2012].
- Payen, G. (2007). Recognising informal education in urban and peri-urban West Africa, *Putting Research Knowledge into Action*, (26), International Institute of Water Management

- Pinderhughes, R. (2004). *Alternative urban futures- planning for sustainable development in cities throughout the world*, London: Rowman and Littlefield.
- Qiu, H., Cheng, X. & Zhu, W. (2005). Some questions on urban agriculture, *Science and Technology Review*, 23(5), 56–58.
- Quon, S. (1999). Planning for urban agriculture : A review of tools and strategies for urban planners, *Cities Feeding People Series Report 28*
 Planning for Urban Agriculture : A Review of Tools and Strategies for Urban Planners,
- Rakodi, C. (1998). *Review of the poverty relevance of the peri-urban interface production system research*, report for the DFID Natural Resources Systems Research Programme (PD 70/7E0091), second draft
- Rostow, W. (2004). ‘The dimensions of global urban expansion: Estimates and projections for all countries, 2000 2050.’ *Progress in Planning*, 75(2), 53-107.
- Schnell, S. (2007). Food with a farmer’s face: Community supported agriculture in the United States, *Geographical Review*, 97 (October), 550–564.
- Sharp J, Imerman E, Peters G. (2007). Community supported agriculture (CSA): Building community among farmers and non-farmers, *J Ext.* 40, 1–7.
- Smit, J. & Nasr, J. (1992). Urban agriculture for sustainable cities: Using wastes and idle land and water bodies as resources, *Environment and Urbanization*, 4(2), 141–152, available at: <http://eau.sagepub.com/cgi/doi/10.1177/095624789200400214> [Accessed November 20, 2014].

- Smit, J., Nasr, J. & Ratta, A. (2001). *Urban agriculture food, jobs and sustainable cities*.
- Songsore, J. (2000). *Towards building a model of urban growth dynamics: The case of 'Large' Northern Ghanaian towns*, Accra: University Press, 6 (1), 114-127.
- Stake, R. E. (2000). The case study method in social inquiry. *Educational Researcher*, 5- 8.
- Tacoli, C. (2002). Changing rural–urban interactions in sub-Saharan Africa and their impact on livelihoods: A summary, *Working Paper 7* in Rural–Urban Interactions and Livelihood Strategies Series, IIED, London.
- Tefera, M. (2010). Food security attainment role of urban agriculture: A case study from Adama Town, central Ethiopia. *Journal of Sustainable Development in Africa*, 12(3), pp.223–249.
- Teig, E., Amulya, J., Bardwell, L., Buchenau, M., Marshall, J. A. & Litt, J. S. (2009). Collective efficacy in Denver, Colorado Strengthening neighbourhoods and health through community gardens, *Health & Place*, 15(4), 1115–1122. doi:10.1016/j.healthplace.2009.06.003
- UNFPA, (2007). *Unleashing the Potential of Urban Growth*, State of World Population, New York:UNFPA
- UN-HABITAT (2006). *World urbanisation prospects: The 2005 revision*, New York: Population Division, Department of Economic and Social Affairs, United Nations available at <http://www.unhabitat.org>.
- UN-HABITAT (2010). *The state of African cities 2010: Governance, inequality and urban land markets*, Nairobi: UN-Habitat.

- United Nations Development Programme (2002). World urbanization prospect: The 2001 revision data, tables and highlights, *ESA/P/WP* New York: UNDP.
- vanVeenhuizen, R. (ed.) (2006). *Cities farming for the future: Urban agriculture for green and productive cities*, RUAF Foundation, IDRC and International Institute for Rural Reconstruction, Leusden, The Netherlands.
- World Bank (2000). *World development report 1999/2000, Entering the 21st Century*, New York: World Bank.
- Yang, Y. (2011). On the development patterns of urban agriculture and its ways: A research on urban agriculture in Zhengzhou, *Reformation & Strategy*, 27(12), 112– 114.
- Yeboah, E. & Obeng-Odoom, F. (2010). We are not the only ones to blame District Assemblies' perspectives on the state of planning in Ghana, *Commonwealth Journal of Local Governance*, 7/ 78-98.

APPENDICES

APPENDIX 1

UNIVERSITY OF CAPE COAST

SCHOOL OF GRADUATE STUDIES AND RESEARCH

DEPARTMENT OF GEOGRAPHY AND REGIONAL PLANNING

**TOWN AND COUNTRY PLANNING DEPARTMENT INSTITUTIONAL
INTERVIEW GUIDE**

Thank you for agreeing to take part in this survey on **‘MAPPING PERI-URBAN AGRICULTURE SYSTEM IN THE SEKONDI-TAKORADI METROPOLIS’**. This study is being conducted as part of an MPhil programme in Geography and Regional Planning Department, University of Cape Coast. The research is part of the academic requirements for the completion of the MPhil programme. You are assured that all responses provided would be strictly confidential and use for academic purposes only. Your anonymity is guaranteed.

Name of Institution: Town and Country Planning Department

Position of Respondent:

Date of Interview:

**MODULE 1: UNDERSTANDING PLANNING INSTITUTIONS,
POLICY AND DECISION MAKING PROCESS**

1. Which institutions are responsible for peri-urban agriculture land allocation and implementation and monitoring?

.....
.....

2. How are smallholder farmers organized to undertake peri-urban farming?

.....
.....

3. Is there a legal framework guiding peri-urban agriculture implementation?

.....
.....

**MODULE 2: INTEGRATING PERI-URBAN AGRICULTURE INTO
CITY DEVELOPMENT.**

4. How can urban agriculture production systems be developed and promoted in urban settings with reduced negative externalities?

.....
.....

5. How can land use planning and peri-urban agriculture be coordinated and controlled for sustained

a) poverty reduction

.....
.....

b) environment

.....
.....

c) health

.....
.....

d) peri-urban land competitiveness?

.....
.....

6. How best can peri-urban agriculture be accommodated into urban settings for sustainable land governance?

.....
.....

7. What is sustainable city development?

.....
.....

MODULE 3: UNDERSTANDING SPATIAL LAND USE PLANNING PRACTICES

8. How is spatial land use planning done and in which ways do different actors participate?

.....
.....

9. What tools are used for spatial land use planning?

.....
.....

10. Which institutions are responsible for the preparation, implementation and monitoring of land use planning?

.....
.....

11. What are the procedures used for and main components in the land use planning process?

.....
.....

12. How does the decision making process take place in order to enable different actors involved in the land use planning process including initiation, declarations, implementations and allocation of land for smallholder farmers?

.....
.....

13. How do smallholder farmers access land?

.....
.....

14. What forms of land ownerships currently exist in the city?

.....
.....

15. What are the conditions set for changes in land use?

.....
.....

16. What tools are in place for monitoring and evaluating land use outputs?

a) monitoring.....

.....

b) evaluating.....

.....

17. What are the procedures for obtaining peri-urban agriculture permit?

.....

.....

18. Are you aware of any policies or guidelines guiding land development including peri-urban agriculture?

.....

.....

19. What are the voices of different actors in terms of the effectiveness of the land use planning process and the implementation of the urban agriculture in the city?

.....

.....

20. How can land use planning processes provide room for urban agriculture integration in order to improved land governance?

APPENDIX 2

UNIVERSITY OF CAPE COAST

SCHOOL OF GRADUATE STUDIES AND RESEARCH

DEPARTMENT OF GEOGRAPHY AND REGIONAL PLANNING

METROPOLITAN ASSEMBLY INSTITUTIONAL INTERVIEW GUIDE

Thank you for agreeing to take part in this survey on ‘**MAPPING PERI-URBAN AGRICULTURE SYSTEM IN THE SEKONDI-TAKORADI METROPOLIS**’. This study is being conducted as part of an MPhil programme in Geography and Regional Planning Department, University of Cape Coast. The research is part of the academic requirements for the completion of the MPhil programme. You are assured that all responses provided would be strictly confidential and use for academic purposes only. Your anonymity is guaranteed.

Name of Institution: Metropolitan Assembly

Position of Respondent:

Date of Interview:

MODULE 1: RECOGNIZING AND PERMITTING PERI-URBAN AGRICULTURE

1. Which agricultural activities are officially allowed within peri-urban areas?

.....
.....

2. Name any restrictions or conditions that apply to the activities above (e.g., location of activity, participants in activity)

.....
.....

3. What is the Metropolitan Assembly doing to facilitate peri-urban agriculture activities?

.....
.....

4. Is peri-urban agriculture mentioned in the official documents of the Metropolis?

(a) Yes [] (b) No [] (c) Don't know []

5. Is urban agriculture defined in any of these documents?

(a) Yes [] (b) No [] (c) Don't know []

If yes, please state or attach a copy of the most widely used definition.

6. Do you think that the practice of agriculture is appropriate within the Metropolis?

(a) Yes [] (b) No [] (c) Don't know []

Please explain your answer

.....
.....

MODULE 2: LOCATING PERI-URBAN AGRICULTURE

ACTIVITIES

7. Where do peri-urban agriculture activities officially occur within the metropolis?

.....
.....

8a. Are there areas where you think peri-urban agriculture should be done or allowed?

(a) Yes [] (b) No [] (c) Don't know []

Please explain your answer

8b. Are there areas where you think peri-urban agriculture should not be allowed?

(a) Yes [] (b) No [] (c) Don't know []

Please explain your answer

.....
.....

9. In the metropolitan official plan and policies, is peri-urban agriculture recognized as a land use category that is distinct from other land uses?

(a) Yes [] (b) No [] (c) Don't know []

10. Which land use category (ies) or zone(s) does urban agriculture fall?

(Check as many as apply)

___ Residential ___ Commercial ___ Industrial
___ Agriculture ___ Park/Open Space ___ Other

Module 3: RESPONSIBILITY FOR CONTROL AND GUIDANCE OF PERI-URBAN AGRICULTURE

11. Is there government department or agency responsible for peri- urban agriculture

a. control b. regulation

(a) Yes [] (b) No [] (c) Don't know []

If yes, please name the department(s), agency (ies) and describe the responsibility (ies)

.....
.....

MODULE 4: TOOLS AND STRATEGIES TO INTEGRATE PERI-URBAN AGRICULTURE

12. What are the means used to promote or facilitate peri-urban agriculture in the metropolis?

.....
.....

14. What information is needed for metropolitan decision makers to formulate good policies regarding peri-urban agriculture?

.....
.....

16. What is the best metropolitan unit for coordinating peri-urban agriculture, and should it be a technical (agriculture, environment, planning) or more integrated unit (multi-departmental working group)?

.....
.....

APPENDIX 3

UNIVERSITY OF CAPE COAST

SCHOOL OF GRADUATE STUDIES AND RESEARCH

DEPARTMENT OF GEOGRAPHY AND REGIONAL PLANNING

MOFA INSTITUTIONAL INTERVIEW GUIDE

Thank you for agreeing to take part in this survey on **‘MAPPING PERI-URBAN AGRICULTURE SYSTEM IN THE SEKONDI-TAKORADI METROPOLIS’**. This study is being conducted as part of an MPhil programme in Geography and Regional Planning Department, University of Cape Coast. The research is part of the academic requirements for the completion of the MPhil programme. You are assured that all responses provided would be strictly confidential and use for academic purposes only. Your anonymity is guaranteed.

Name of Institution: MOFA

Position of Respondent:

Date of Interview:

MODULE 1: UNDERSTANDING PLANNING INSTITUTIONS, POLICY AND DECISION MAKING PROCESS

1. Which institutions are responsible for peri-urban agriculture land allocation and implementation and monitoring?

.....
.....

2. How are smallholder farmers organized?

.....
.....

3. Is there a legal framework guiding peri-urban agriculture implementation?

.....
.....

4. What are the processes involved in acquiring land for urban agriculture?

.....

5. What are the suggested modes in which land acquisition can be sustainable for effective peri-urban agriculture implementation?

.....

6. What are the factors hindering urban agriculture?

.....

7. Who are the key actors?

.....

8. Who are the stakeholders?

.....

9. Is there demand for ideas among actors and stakeholders?

.....

10. What are their agenda/voices of planning institutions?

.....

11. What key opportunities, threats, and constraints does the urban agriculture sector face?

.....
.....

**MODULE 2: INTEGRATING PERI-URBAN AGRICULTURE INTO
CITY DEVELOPMENT.**

12. How can land use planning and peri-urban agriculture be coordinated and controlled for sustained poverty reduction, environment, health, and peri-urban land competitiveness?

.....
.....

13. In what ways can urban agriculture be accommodated into urban settings for sustainable land governance?

14. What information is needed for metropolitan decision makers to formulate good policies regarding peri-urban agriculture?

.....
.....

15. What is the entry point for supporting peri-urban agriculture: the individual farmers or producer groups?

.....
.....

9. How can peri-urban agriculture activities be financed in the city?

.....
.....

APPENDIX 4

UNIVERSITY OF CAPE COAST

SCHOOL OF GRADUATE STUDIES AND RESEARCH

DEPARTMENT OF GEOGRAPHY AND REGIONAL PLANNING

INTERVIEW SCHEDULE FOR PERI-URBAN FARMERS

Thank you for agreeing to take part in this survey on ‘**MAPPING PERI-URBAN AGRICULTURE SYSTEM IN THE SEKONDI-TAKORADI METROPOLIS**’. This study is being conducted as part of an MPhil programme in Geography and Regional Planning Department, University of Cape Coast. The research is part of the academic requirements for the completion of the MPhil programme. You are assured that all responses provided would be strictly confidential and use for academic purposes only. Your anonymity is guaranteed.

Module 1: BACKGROUND/DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

1. Sex a. Male [] b. Female []
2. Age of respondent
3. Educational Status
 - a. Primary [] b. Junior [] c. Secondary/vocational []
 - d. Tertiary [] e. non-formal []
4. Occupational status
 - a. Self Employed [] b. Casual Employment [] c. permanent employment []

5. Marital status a, Single [] b. Married []
 c. other
- 6 No of children
7. other dependents in the household

MODULE 2: EMPLOYMENT AND OCCUPATIONAL CHARACTERISTICS

8. What is your main source of employment?
 a. Agriculture [] b. Commerce [] c. Service [] d. Industry []
 e. Other please specify

9. Do you do any other work in addition to this? a. Yes [] b. No []

9a. If yes, kindly mention it

10. Are you the only worker in this house?
 . Yes [] b. No []

11a. If No, how many people work in this house?

11b. what work do they do?

First Name only	Type of work

MODULE 3: PERI-URBAN AGRICULTURE

12. What type of farming activities are you engaged in?

- a. Crop farming [] b. Animal farming [] c. Fish farming []
 d. Other please specify

.....

13. What is the scale of your farming activities?

- a. Subsistence [] b. commercial []
 c. Other please specify

.....

14. What type of crops/animals/fishes do you cultivate/rear?

	Crops	Animals	Fishes
1			
2			
3			
4			
5			

15. What influenced you to engage in these activities?

.....

16. What is the size of your farm?

- a. Less than acre [] b. 1 - 3 acres [] c. 4 - 6 acres [] d. 7.-9
 acres [] e. more than 10 acres []

15. What is the yield per acre for a season?

.....

16. Where is the farm located?

.....

17. What is the average distance to the farm from the city center ?

a. less than 500 m [] b. 500 m - 1 km [] c. above 1km []

18. Where do you market your farm produce?

.....

19. Where was the source of your initial capital?

a) Own income [] b. Relative [] c. Micro-financial institution []
d. Informal money lender []

20. How many people have you employed on your farm?

21. Do you belong to any farmers association? a) Yes [] b) No []

21a If yes, how many members are in the association?

.....

21b. If yes, what benefits do you derive from the association?

.....

.....

22a. Do you have access to extension services? a) Yes [] b) No []

22b. if yes state the kind of services

.....

.....

23. Do you receive any support from the government? a) Yes [] b) No []

24a. If yes, in what form

.....

25. kindly mention three most important problem you face in this work in order of seriousness

1.

2.

3.

26. How do you think they can be solved?

1.

.....2.

.....

3.

27. Do you have problems with any public institution? a) Yes [] b) No []

28 If yes, what are the problems and institutions?

PUBLIC INSTITUTION	PROBLEMS