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**EFFECTS OF URBANIZATION ON THE AVAILABILITY OF LAND FOR CROP
FARMING: A CASE STUDY OF GA EAST MUNICIPALITY**

SUBMITTED BY

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**THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF GHANA,
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DECLARATION

I, Samuel Kwarteng Opoku, hereby declare that except for the references of other peoples' work which have been duly acknowledge, this study titled "Effects of Urbanization on the Availability of Land for Crop Farming: A Case Study of Ga East Municipality" is my original work carried out under the supervision of Dr. Fred M. Dzanku. This work has neither in full nor part been submitted for any other degree in any institution.

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DEDICATION

This study is dedicated to the Almighty God, my family, friends and every individual who by their effort made it possible for me to recognize my potential and pursue it.

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LIST OF ABBREVIATION

AMA	Accra Metropolitan Assembly
DESA	Department of Economic and Social Affairs.
FASDEP	Food and Agricultural Sector Development Policy
GAEC	Ghana Atomic Energy Commission
GEMA	Ga East Municipal Assembly
GSS	Ghana Statistical Service
GWMA	Ga West Municipal Assembly
LaNMMA	La Nkwantanang Madina Municipal Assembly
METASIP	Medium term Agricultural Sector Investment Plan
MMDA	Metro-Municipal & Districts Assemblies
MOFA	Ministry of Food and Agriculture
MPCU	Municipal Planning Coordinating Unit
NDVI	Normalized Difference Vegetation Index
UN	United Nations

ABSTRACT

The city of Accra currently accommodates about four million people. The city has now expanded to the fringes that were previously rural settlements. Most of these rural settlements were farming communities that provided food for the city.

However, urbanization has affected agricultural production and farmlands are being lost to other land uses. This study examines the effect of urbanization on the availability of land for crop farming in the Ga East Municipality. The study used a mixed method approach involving a survey of 100 farmers, in-depth interviews and focused group discussions conducted in selected communities in the Ga East Municipality in the Greater Accra Region of Ghana. Regression analysis was used to examine the association between farmer income and size of cultivated land. As expected, the results of the study show that the Ga East Municipality is undergoing rapid urbanization. Agricultural lands have been converted into residential estates. The change in land use, mainly from agriculture to housing, has had some negative effects on agricultural production, incomes, and employment. The study revealed that the rate of loss of arable land has intensified in the last fifteen years as a result of urbanization as showed by NDVI data. The survey revealed a positive association between size of land cultivated and income. This suggests that the decreasing size of farmland, due to land use change, has implications for livelihoods in an area where half of the sample reported that farming is their main employment activity. The study also identified alternative jobs, alternative farmland, and intensive farming as coping strategies adapted by farmers. Given that the urban plan of the Ga East Municipality has not allocated space for farming, it is recommended that some land be demarcated for agriculture to ensure sustainable agricultural livelihoods and food security.

CHAPTER ONE

1.1 Background

About 54% of the population of the world is concentrated in urban locations and urban population is estimated to reach up to about 60% by the year 2050 (UN DESA, 2015). McGranahan and Satterthwaite (2014) define urbanization as an expansive rural-urban movement, which includes population, land use, economic activity, and culture. Urbanization is mostly used to refer to land use change for particular areas often at the fringes of urban centres. Due to urbanization, some countries are having difficulties in meeting the needs of their population in urban locations. These will include problems of housing, employment, energy, transportation as well as basic needs of life such as food, education and healthcare (Songsore, 2004).

Many researchers have associated urbanization with economic growth (Strange, 2008). Spence, et al. (2009) also perceive urbanization as pivotal in the economic growth of an area. Urbanization can be seen as a mechanism that provides economic, social and environmental opportunities when utilized well (McGranahan and Satterthwaite, 2014). By principles of urban agglomeration, for example, enterprises are able to tap economic benefits present in urban locations. It is also cheaper to provide public transport and other utility services such as water and electricity for a densely populated area than for a sparsely rural populated area (McGranahan and Satterthwaite, 2014). Other researchers (Henderson, 2003; Brückner 2011) however, perceive urbanization in Africa as negative for economic growth. A study by Brückner (2011) for example, revealed a negative relationship between urbanization and GDP per capita growth.

In Ghana, an area with a population of 5000 people and above is said to be an urban area (GSS, 2010). The country's urban population has increased over the past five decades from about 500,000

people in the 1950s to 12 million people in the 2000s (GSS, 2010). This radical transformation as termed by Songsore (2004) is demographic urbanization rather than economic urbanization because Ghana's economy is still largely agrarian. This demographic urbanization is because of rural-urban migration, natural increase in towns and re-classification of villages into towns as they grow (Songsore, 2003)

The most urbanized region in Ghana is Greater Accra with ninety-one percent (99%) of it being urbanized (GSS, 2010). The incidence of urbanization results in congestion, unemployment, unregulated urban expansion resulting in the transformation of hitherto rural communities in peri-urban areas to urban areas. Urban agriculture is an important source of livelihood for the urban poor in Africa (Arku et al., 2012). With the high demand for land, agriculture land is lost to urban-related activities such as the construction of buildings, sand winning, and other commercial activities.

Urban agriculture is usually done on small to medium size lands (ranging from 0.16 acre to 1 acre of land).

With an increase in demand for land coupled with urbanization, land use always changes. Agricultural lands are being sold to investors for the development of residential apartment and commercial properties. This makes the urban poor who rely on agricultural land as a source of livelihood to lose out (Bugri et al., 2017; Hovorka et al., 2009).

This study is located in the Ga East Municipal, which lies on the fringe of the Greater Accra region and shares a boundary with the Eastern Region. The study examines how agriculture within a peri-urban area responds to urbanization, particularly population pressure and demand for land for physical development. It also examines coping mechanisms adopted by farmers.

1.2 Problems Statement

Increasing population, coupled with urbanization, has exerted pressure on agricultural lands, which are being converted to other uses for urban development (Obeng-Odoom, 2014). This has bred new trends of investments where large tracts of land are being acquired purposely for real estate development. The increased demand for land has led to high competition and reduced access to land for farming and grazing (Bugri et al., 2017).

There is also a growing interest in the urban-rural interface. Tacoli & Agergaard (2017) describe this interface as the 'grey' area where farming co-exists, often uneasily, with the expansion of built-up areas. Urban farming has helped in providing incomes and improving the diets and nutrition of low-income residents, while at the same time potentially contributing to ecosystem balance (Tacoli & Agergaard 2017).

The Accra Metropolitan Area serves as the hub for national administration, commercial, industrial, and educational centres, which have attracted a lot of people from across the whole country to the area. These attractive features contribute to urbanization with migration contributing about 35% of the increase in population leading to pressure on land and urban amenities (Yankson, 2006).

The Ga East Municipal is one of the assemblies within the Greater Accra Region. It serves as a commuter zone for the increasing number of people who access the central business district of Accra (GEMA, 2017). There has been rapid growth of some areas in the Ga East Municipal such as Haatso, Kwabenya, Dome and Abokobi. These areas, which were rural in 1980s, are now urban localities. This is because of the spill over of growth of the Accra Metropolitan Assembly into localities in the surrounding Districts. As rural areas expand to become urban, agricultural lands are lost to commercial and informal activities.

About 55% of the economically active population in Ga East Municipality is involved in agriculture (GEMA, 2017). Both crop and livestock production are undertaken in the municipality. The municipality is noted for the cultivation of vegetables such as pepper, tomatoes, cabbage, okra and garden eggs (GEMA, 2017). The pressure on land for development of residential buildings and settlement is leading to the loss of agricultural land. The effects of the loss of arable land could have implications for the livelihoods of the farmers and the land use-planning regime (GEMA, 2017).

The improvement in the road network from Accra to the Ga East Municipality has contributed to the increased accessibility to the capital (Accra). Currently, more people can commute easily and faster to this area either in search of land for agricultural or residential purposes. The relatively cheaper land price has increased the number of real estate companies demanding large tracts of land for residential estates. Thus, lands used for farming are lost to real estate development.

The physical planning department is in charge of preparing and approving planning schemes in the municipality. In an interaction with the department, it was revealed that the conventional uses incorporated in the urban use plans, are residential, commercial, education, recreational and civic-cultural uses. Agricultural land uses are not included in the approved layouts. A study by Mubvanni and Mushamba (2006) show that urban planners and other professionals often lack the expertise and logistics to deal with urban agriculture issues and therefore do not incorporate them into urban development plans. Farmland once lost to various construction activities is irreversible and affects the livelihood of the farmers and the food security of the urban and peri-urban areas.

A number of studies have been carried out on urban agriculture in Ghana, especially in the peak centres of regional capitals of the country such as Accra, Kumasi and Tamale on aspects of

importance of urban agriculture, challenges just to mention a few. However, these studies have paid little attention to the changes in land use as a result of urbanization and the availability of farmland in the GA East Municipality.

1.3 Objectives

The main objective of the study is to examine the changes in land use because of urbanization and the availability of farmland in the Ga East Municipality (GEMA). The specific objectives are:

1. To identify the changes in land use in GEMA.
2. To analyse the factors influencing the availability of agricultural land in GEMA.
3. To examine the livelihood outcomes and coping strategies in response to the change in land use in GEMA.

1.4 Research Questions

The study, therefore, seeks to answer the following questions:

1. How have changes in land use affected the availability of agricultural land in GEMA?
2. Which factors contribute to the loss of agricultural land in GEMA?
3. What are the livelihood outcomes and coping strategies in response to the scarcity of land for farming?

1.5 Scope and Limitation of Study

The study covers three areas in the Ga East Municipal: Abokobi, Sesemi, and the Ghana Atomic Energy Commission (GAEC) lands (Bohye Area). The population in these locations present an opportunity to study how urbanization affects farmers and the communities as a whole. It is also

within these localities where crop farming is massively taking place. Because of limited time and resources, only farmers under the agricultural extension programme were interviewed.

1.6 Justification of Study:

It is expected that the study will examine the changes in land use as a result of urbanization and the availability of farmland in the Ga East Municipality. It is also envisioned that the study will serve a useful purpose of reference material for the academic society for further research on Ga East Municipality and related topics.

1.7 Organization of the Study

The next chapter is devoted to existing literature relating to urbanization, peri-urban and urban agriculture, and land tenure. The profile of the study area and methodology are discussed in chapter three. Chapter four presents the findings while chapter five concludes and provides recommendation.

CHAPTER TWO

LITERATURE REVIEW

2.1 Definition of Urbanization

Urbanization is seen as a major cause of changes in land use. Urbanization is defined by McGranahan and Satterthwaite (2014) as an expansive rural-urban movement which includes population, land use, economic activity, and culture. It is mostly used to refer to land use change for particular areas often at the fringes of the urban populace. As an area becomes urbanized, virgin lands are developed for urban space use (for instance, the sale of plots for real estate purposes). According to the United Nation Department of Economic and Social Affairs (UN DESA) Population Division, it is estimated that as at 2014, about 54% of the world's population was concentrated in cities and big towns (urban areas). The world's urban population is expected to reach 66% by the year 2050 (UN DESA, 2014). Urbanization taking place in developing countries has resulted in challenges faced by governments in meeting the needs of the rising urban population. The challenges include problems of accommodation, employment, energy, transportation, infrastructure alongside basic services such as education and healthcare. However, urbanization can be said to be a stimulant for economic development. Accelerating urbanization has a positive association with economic development, especially in terms of Gross Domestic Product (GDP) and per capita income. Through urbanization, a synergy is created between rural and urban areas. The goods from rural areas are used to feed the urban population while urban areas provide services to support the rural production (McGranahan and Satterthwaite 2014; Satterthwaite and Tacoli 2003). In Ghana, urbanization can be described as a process of an increase in the population of an area described as "urban" (GSS, 2010). All the capital towns in Ghana are described as urban localities. These localities have high population concentration. This is because,

these localities serve as a hub for education, industrial, commercial and administrative purpose.

These reasons have pulled a lot of people to these localities.

2.2 Theory of Urban Growth

Theories of urban growth have been used to explain how urban areas expand over space. Among them is the concentric zonal model by Ernest Burgess in 1925.

2.2.1 Concentric Zonal Model

This theory developed by (Burgess, 1925) as cited by (Meyer, 2000) is used to explain urban social structure. It shows urban land usage in concentric rings. It gives a descriptive representation of urban land usage that demarcates cities into forms of concentric circles (Balakrishnan, and Jarvis, 1991). With this model, it is assumed that there is an association between the socio-economic level (mainly income) and the household location away from the Central Business District (CBD)(Townsend and Walker, 2002). The concentric zonal model divides the city into six zones.

The first zone or region is the Central Business District. Here, most of the tertiary jobs are located. The area is the most accessible because the urban transport infrastructure converges here (Townsend and Walker, 2002). The second region is next to the CBD with most industrial activities taking place and making good use of the nearby labour and markets. In addition, most transport hubs, such as port sites and railyards are situated nearby the central area (Townsend and Walker, 2002). The third region inhabits the poorest chunk of the urban population, usually first-generation immigrants living in poor accommodation facilities (Balakrishnan and Jarvis, 1991). In the fourth region, most of the inhabitants are in the working class alongside those who have migrated from the previous zone (mostly second-generation immigrants). The region provides low cost location for the working class because it is located close to key sources of employment. The fifth Zone is

characterized by higher quality housing associated with extensive traveling costs. The sixth zone has features of high class and expensive housing in the hinterlands or suburbanized setting. The shuttling costs are the highest. Around the 1930s, most of these settlements were found near rail stations.

Burgess (1925) defines urban growth as a process of enlargement and reconversion of land uses, with a propensity that each inner region will expand to the outer zone. This theory was built on the “Von Thunen’s regional land use model” in 1826 for analyzing agricultural patterns in Germany (Rodrigue, J-P *et al.*, 2017). The model operates on the assumption that land for agricultural purposes is mottled into a set of concentric circles around a market that consumes all the surplus production (Rodrigue, J-P *et al.*, 2017). Five rings graphically depict the model. The core circle is the central city with less agricultural activity. In the second ring, perishable goods are cultivated. The third ring concentrates on forestry products, the fourth ring concentrates on field crop farming and the last zone is for ranching. The cost of transporting agricultural produce and land cost remain as an important consideration to decision-making regarding myriad industries but the land cost is directly responsible for the elimination of thousands of farms around the city that became increasingly encroached upon by ever-expanding cities (Alan et al., 1978; O’Kelly, 2010). With an increase in land values in peri-urban areas as a result of higher demand for quality housing, the cost associated with agricultural activities becomes prohibitively high. This makes farmers unable to afford the cost associated with quality land close to cities. Both the Von Thunen and Burgess models have been criticized as not practical in the contemporary world (Sinclair, 1967). However, others also are of the view that, the Von Thunen model can be associated with less developed countries due to underdeveloped transportation system and poor food preservation mechanism (Alan et al., 1978; O’Kelly, 2010)

2.3 Urbanizations in Africa

Urbanization growth rates are high and on the rise in Sub-Sahara Africa, (McGranahan and Satterthwaite (2014). The rate at which people are moving into cities is unprecedented. Most of the migrations into cities are driven by job seeking behaviour (Mabogunje. 1990). Albeit, Africa is the least urbanized continent with about 30% of its population concentrated in urban centres. It has the world's highest urbanization rates averaging around 5%, which usually happens in large cities (Obudho and Juma, 2002). This has created pressure on the few available infrastructure (Turok and McGranahan, 2013). Urbanization in Africa is mainly through rural-urban migration. Land as a factor of production always has the tendency of its demand rising because of the growing rate of urbanization in urban areas. Investors have always viewed land or landed properties as a hedge against inflation (Hoesli, 1994). The prospect from speculation and investment of peri-urban land has led to the obstinate acquisition of large tracts of agricultural land by investors or speculators without regards to agricultural interest (Bunce, 1985; Bugri et al., 2017).

2.4 Urbanization Trends in Ghana

In Ghana, an area is said to be urbanized if its population is 5000 people or above. Urban areas in Ghana are equipped with modern technology that adds to socio-economic development with the cities serving as commercial, industrial, administrative and institutional centres (Appiah, 2012). The rate of urbanization in Ghana has been fast. During the colonial era, towns along the coast became trade centres which led to their rapid expansion. Post-colonial urbanization has taken place along the colonial framework (Appiah, 2012; Songso, 2003). The major towns and cities still serve as a socio-economic hub, which turns to attract many people. The most urbanized region in Ghana is Greater Accra with about 90.5% of its inhabitants residing in urban centres (Table 2.1).

The Ashanti Region follows with 60.6% of its residents dwelling in urban areas, particularly Kumasi (Table 2.1). The Upper West and Upper East remained the least urbanized regions in Ghana, with (16.3%) and (21%) respectively, of its residents living in urban settlements.

Table 2.2 revealed that the urban population to the total country population is about 51% according to the national Population and Housing census conducted in 2010. This indicates that more than half of Ghana’s population live in the urban areas as at the year 2010.

Table 2.1: Urbanization Trends, 1960 – 2010 (in percentages)

Region	1960	1970	1984	2000	2010
All Regions	23.1	28.9	32.1	43.8	50.9
Western	24.7	26.9	22.6	36.3	42.4
Central	28.0	29.1	28.8	37.5	47.1
Greater Accra	72.6	85.3	83	87.7	90.5
Volta	13.1	16	20.8	27	33.7
Eastern	21.1	24.6	27.7	34.6	43.4
Ashanti	25.0	29.7	32.5	51.3	60.6
Brong Ahafo	15.6	22.1	26.6	37.4	44.5
Northern	13.0	20.4	25.2	26.6	30.3
Upper East	3.9	7.3	12.9	15.7	21
Upper West	5.0	6.7	10.9	17.5	16.3

Source: Ghana Statistical Service 2010

Table 2.2: Growth in Urban Population, 1948 to 2010

Year	Urban Population	% of urban population to total population
1960	1,551,174	23.1
1970	2,472,456	28.9
1984	3,938,614	32.1
2000	8,278,636	43.8
2010	12,545,229	50.9

Source: Ghana Statistical Service, 2010 (modified)

The drivers of urbanization and urban growth in Ghana can be categorized into three main components. These are natural increase, migration, and changes in city boundary due to decentralization and area re-classification (GSS, 2013). According to Nsiah-Gyabaa (2010), the natural increase is as a result of improvement in food supplies, medical care and better sanitation and hygienic conditions, causing a reduction in death rates, which in turn led to the rise in populations. The population of Ghana has increased by around 38% in the last fifteen years (GSS, 2013). Another driver of urbanization is migration. Even though most migrants are pulled to the urban centres with the view of being employed in the formal sector, according to Songsore, (2003); Santos, (1979) and Hart, (1973), the rapid population of large towns can be explained by the existence of prospective indigenous, informal or petty-trading sector in these large towns. The 2010 census shows that the private informal sector is dominated by more than 85% of Ghana's active labour force employed (GSS, 2013). Most of these private sector jobs are located in urban areas, which attract many people into these areas. This attraction contributes to the rise in urban population. The third major driver of urbanization is decentralization and area re-classification. Decentralization has made it possible for places, which were previously rural, to become district capitals, attracting high population growth rates, and becoming urbanized localities. During the

onset of decentralization in Ghana, there were 110 districts but in 2008, there were 254 districts, indicating that many rural areas have now obtained urban status (GSS, 2010). These are done either by re-classification of the localities' boundaries or the elevation of certain localities into district capitals (GSS, 2005)

With Accra being the administrative capital of Ghana, coupled with high urban growth rates, there is always a high demand for land for economic activities, which in turn raises the price of urban lands. This has resulted in the development of residential neighbourhood along the fringes of the city of Accra (Grant and Yankson, 2003). Studies done by Gough and Yankson, (2000) and Kasanga et al., (1996) showed that the residential development is a threat to the livelihood of the indigenous residents of the villages in the fringe zones as agricultural land is continuously changed to non-agricultural uses. According to Gough and Yankson (2000), much of the land conversion in the fringe areas are from agricultural to residential land uses. The results have always been negative for the smallholder farmers in these areas.

2.5 Land Ownership and Land Titling

In Ghana, there are two major types of land ownership. These are state lands and non-state lands, which are mostly customary lands (Adu-Gyamfi, 2012; Nyame & Blocher, 2010). Under the customary landholding systems in Ghana, there exist three forms, namely the stool lands, family lands and skin lands. In Ghana, the ultimate title and the root of all interest in land is the allodial title. It is held by a family, skin or stool. Among the Akans and some Ga communities, the allodial title is held by the stool and by the skins in the northern region. The *Tendamba* (first settlers) are the allodial title holders in the Upper West and Upper East regions. Allodial title holders are the families, clan or village communities among the Ga-Dangme of Greater Accra Region, Adjumaku

of the Central region and the Anlo of the Volta Region (Kasanga, 2001). The mode of acquisition of lands by the state is through eminent domain as stipulated in Article 20 of the 1992 constitution of Ghana, Administration of Lands Act 1962 (Act 123) and State Lands Act 1962 (Act 125) (Anim-Odame, 2011). Individuals and corporate entities obtain land through purchase, gift or inheritance. It has been observed that in land transactions, people now resort to market and commercial based transactions than to traditional community-based methods (Bugri et al., 2017). Agricultural land, which was previously obtained through inheritance, gift, and membership of a land owning community has now shifted (Bugri et al., 2017). The market-oriented channels such as outright purchase, long-term leases, rent (tenancy agreement) or shared contract are the medium through which indigenes access agricultural land.

After land purchase or acquisition, the interest of the new owner has to be registered with the Lands Commission. Registered land documents help secure the title of the landowner. A land which is being registered helps the owner to get easy access to credit as he can use the land as a collateral. Registered lands have higher land values which in turn lead to higher investment in land and higher income (Feder and Nishio, 1998). However, households that have formal title to land but are not recognized or supported by the customary structures and institutions are insecure, while lands obtained by means of traditional process and rights secured by social norms and beliefs have provided relative security of tenure overtime (Ayamga and Dzanku, 2013). This weakens the definition of land tenure security as land titling, which in turn affects farm investments. Also, a study by Ayamga et al., (2015) revealed that being an indigene of an area and age is positively associated with improved land tenure security even without formal land documentation or titling. Thus, a farmer in a community may feel secure of his land if he had observed the traditional process and rights secured by social norms and believes in acquiring the land.

2.6 Urban Agriculture

According to Obudho and Foeken (1999) farming in urban centres is a popular activity in Africa. It is normally done within the residing compound of the farmer popularly known as “backyard farming” or on land belonging to another person of which the owner may be the government, an institution or private individual. The definition of urban Agriculture by Mougeot (2006) as cited by Balthazar et al., (2015) is the production of edible and non-edible plant, tree crops, rearing of animal both within and along the fringes of the built urban areas for household use as well as for sale to the rapidly growing urban population. Urban agriculture serves as a means of alleviating poverty through improving food security and the provision of jobs, food, and income to urban residents (Foeken, 2013). It is estimated that in developing countries, urban agriculture contributes about 30-71% to the income of urban farmers (Zezza and Tasciotti, 2010; Mugisa et al., 2017). Studies in Tamale (Northern Region of Ghana) showed that there have been a lot of diversity among urban farmers to include teachers, government officials, students, casual labourers, part-time workers and the unemployed (Gyasi et al., 2014). Because of urbanization, there has been a significant positive shift to consumption of agricultural products such as vegetables, dairy product, meat and luxury food due to changes in diet from the increasing urban population (de Hean et al., 2003). The high demand for these products coupled with diminishing farmlands have created food security challenges for both rural and urban population (Satterthwaite, et al. 2010).

Accessing land for farming in many cities is a major challenge for the urban poor (Smit et al. 1996; Lee-Smith 2010). Most urban farms are done on vacant/open spaces within the city of which most of these are on government land with a few on private individual lands and backyard gardens. The backyard gardens are usually for home consumption (Gyasi et al., 2014). An urban extension

usually captures some agricultural lands, which cause variations in the land market around the cities, leading to speculation. Urban areas expand haphazardly in Middle and Low-income countries because the land use plan or strategic planning framework to control land use changes is not adhered to, if not absent. Hardoy et al. (2001) were of the view that, if these regulations are even available, estate developers and politicians mostly avoid them. The reduction in land available for agriculture in urban areas would lead to production that is more intensive on the remaining lands (Bentinck, 2000). Most urban farmers have turned to the practice of intensive farming on relatively small farmlands.

In Ghana, urban agriculture became popular during the period of 1972-1979 under a government programme called “Operation Feed Yourself”. It promoted farming in the urban centres to support food production in rural areas as a solution to food shortages in Ghana (Gyasi et al., 2014). However, this practice lost its intensity as the long drought and resultant economic hardships lessened around the late 1980s. About 80% and 10% of cabbage available on the markets of Tamale and Accra respectively are from the open-fields in these urban centres (MOFA, 2009). The practice of urban agriculture adds a lot to the urban economy. Through Urban Agriculture, income and employment are provided to market sellers, suppliers of agricultural input and farmers, contributing to the growth of the urban economy (Obuobie et al., 2006).

The interaction between urbanization and agriculture presents a particular set of problems for agriculture. In Tamale, a study by Gyasi et al., (2014) indicated that the rate of urban agriculture’s contribution to livelihood has reduced. This is due to urbanization, land scarcity, insecure tenancy and poor access to water resources for urban agriculture, which in turn create significant challenges for farmer’s livelihood. As a result, farmers are gradually leaving agriculture for other occupations (Gyasi et. al, 2014).

Both men and women, mostly below 30 years of age, are involved in urban agriculture (Gyasi et al, 2014). A study by Shaibu (2002) showed that about 97% of urban farmers were males. The male dominance in vegetable cultivation could be linked to their traditional gender roles (Gyasi et al, 2014).

The challenges of urban agriculture are competition from urban land uses. Access to land and tenure security are key constraints to urban agriculture (Flynn-Dapaah, 2002). Also, the anticipation of more profit from the sales of land at later days by developers and speculators hinders agricultural expansion. This creates pressure on the available land. The growing pressure leads to competition and subsequent redefinition of access to land (Bugri and Yeboah, 2017). A study conducted by Appiah et al. (2014) showed that property owners convert their farmlands to other uses (commercial, residential or recreational) because they see agriculture as unprofitable.

Due to land acquisition problems, urban farming is usually done on lands belonging to the government and on open spaces (Gyasi et. al, 2014). Some farmers also have to relocate to other peri-urban areas. This, in turn, has effects on their productivity and income as several hours are spent travelling from one farm to the other on foot or spending a greater part of their income on transportation (Bugri et al, 2017).

2.7 Policy on Urban/Peri-Urban Agriculture

Food and Agricultural Sector Development Policy (FASDEP) II is among the current policies' framework in Ghana governing the food and agriculture sector. FASDEP II describes urban farming as a major livelihood approach for the poor in urban areas, especially migrants even though they have challenges in accessing land and irrigation water. FASDEP II has some features that help to promote sustainable urban agriculture. Another policy by the government to promote the development of agriculture is the Medium Term Agricultural Sector Investment Plan

(METASIP II). A major component of the Medium Term Agricultural Sector Investment Plan (METASIP II) 2014-2017 is to ensure an increase in incomes of farmers in the peri-urban and urban areas through modernized and sustainable agriculture (MoFA, 2015). The policy seeks to help in the development of community land use plans to incorporate urban and peri-urban agriculture and to enforce it. The current government had also introduced a programme called Youth in Agriculture which is geared towards providing jobs for the youth with the aim of enhancing economy growth.

2.8 Gaps Identified in Literature

Previous studies have shown the significance of urban agriculture and the threats to the urban economy. It has been established through literature that urbanization is causing a reduction in farmland sizes; but the changes in the land use and availability of farmlands in Ga East Municipality have been ignored in earlier studies. Therefore, the current study brings to bear the factors which are causing the reduction in sizes of farmlands that affects the productivity of urban farmers.

CHAPTER THREE

PROFILE OF STUDY AREA AND METHODOLOGY

This section comprises three sub-sections. These include the profile of the study area, the conceptual framework and the methods of data collection and analysis.

3.1 Geographical Description

An Act of Parliament (Legislative Instrument 1589) established the Ga East Municipal Assembly (GEMA) in 2004 as a district. It became a Municipal in 2008 by Legislative Instrument 1864. The La-Nkwantanang Madina Municipal Assembly (LaNMMA) was split from it in 2012 (GEMA, 2017).

3.1.1 Location

There are twenty-six (26) Metropolitan, Municipal and District Assemblies (MMDAs) in the Greater Accra Region, which includes the Ga East Municipal Assembly. It has about 96 square kilometres of land area. The settlements within the Municipality are about fifty-two (52) with Abokobi, as the capital of the Municipality. The Assembly shares borders with Accra Metropolitan Assembly (AMA) in the south, LANMMA to the east, GWMA to the west, and the Akuapim South District to the north. There are two administrative Zonal Councils in the municipality. These are the Dome Zonal Council and the Abokobi Zonal Council (GEMA, 2017). Figure 1 shows the aerial view of the municipality within regional context.

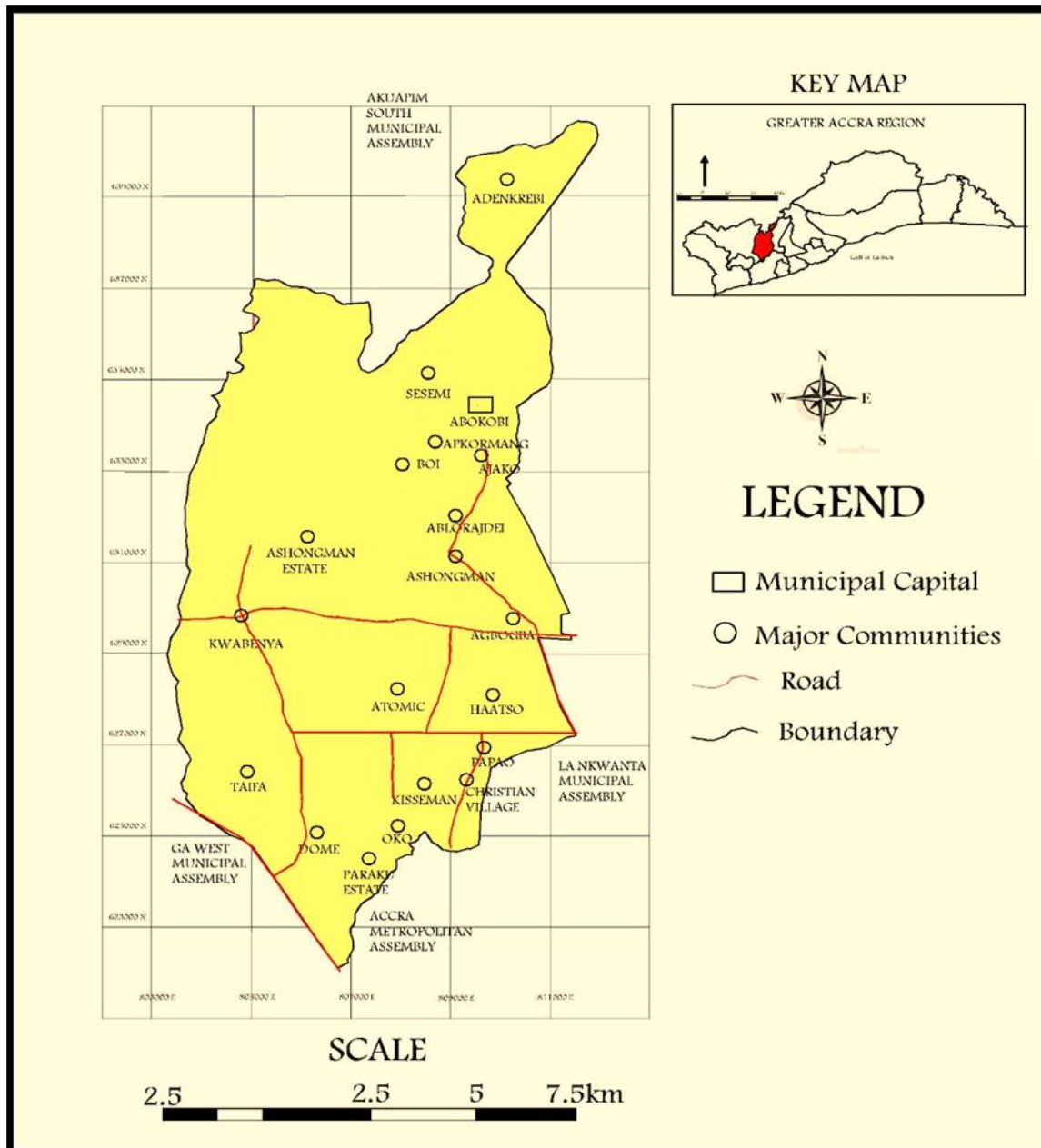


Figure 1: Locational map and Aerial view of municipal.
Source: Ga East Municipal Assembly Medium Term Plan, 2017

3.1.2 Vegetation and Climate

The Municipality is located within the savannah agro-ecological zone. The rainfall pattern is of two folds. The average annual temperature ranges between 25.1 °C in August and 28.4 °C in February and March. There are two main types of vegetation in the Municipality, namely

shrublands and grassland. The shrublands are mostly located in the western outskirts and towards the Aburi hills in the north. It is composed of a thick bunch of small trees and shrubs that have a mean altitude of about five meters. (GEMA, 2017).

3.1.3 Soil Characteristics and the Crops they support

The soil types are generally feted Consociation, Nyigbenya, and Haatso Complex association. They are located at Abokobi, Kponkpo, Akporman Adenkrebi, Taifa, Kwabanya, Haatso, and Dome. They contain excessively well-drained, pale coloured, sandy loam and those on steep slopes contain small pieces of rocks. There is also Fete at Sesemi; they have yellowish brown sand; well-drained with sandy clay loam called Bediesi Complex Association. It is suitable for forestry. Crops such as maize, cassava, yam, pineapple, cowpea, soybean, sisal, sunflower and tree crops like cashew, mango, citrus, teak do well on these soils. (GEMA, 2017).

3.2 Socio-Economic Description

3.2.1 Land Tenure System

Chiefs or Family Heads are the custodians of land in the Municipality, holding them in trust for the people. However, people acquire these lands on rental basis, sharecropping (“nnoboa”), through direct purchase and leasehold. Resale of land is common in the area with its associated litigations and disputes. The urban poor usually lose their farmlands under such circumstances, resulting in unemployment and low food production (GEMA, 2017).

3.2.2 Population

The population of the municipality has been growing over the years due to its serene locations and the rapid desire for residential plots by people in and around Greater Accra. The 2010 Population

Census estimated the Municipality's population at 147,742 with a growth rate of about 4.2%. The Municipal Planning Coordinating Unit (MPCU) estimates the current population at about 208,943. The population density of the municipality is about 1,214 persons per square kilometre, considerably greater than the regional density of 895.5 persons per square metre and the national density of 79.3 persons per square metre. The resultant effect is the great stress on land and resources. Much of the population is concentrated mainly in Dome, Taifa, and Haatso. (GEMA, 2017).

The working age group for the municipality is between 15-64 years with a dependency ratio of 52 percent. Seventy percent of the population is economically active with about 92 percent employed and about 8 percent unemployed. The remaining 30 percent are homemakers, students, individuals who are too old or young to work, pensioners or disabled (GEMA, 2017).

3.2.3 Infrastructure

The main means of transportation in the Municipality is by road. The road network in the municipality is fairly good with linkages to larger towns. The Municipality's large towns are Dome, Kwabenya, Taifa, and Haatso where most of the educational and health centres are situated (GEMA, 2017).

3.2.4 Economic Activities

The main source of livelihood for about 70% of the rural population is agriculture. Most of the farmers are smallholders, and crop and livestock production are their main agricultural activities. Other livelihood activities are gradually gaining popularity; this includes grasscutter, rabbit and mushroom production (GEMA, 2017).

3.3 Conceptual Framework

The conceptual framework shows the relationship between urbanization and the effects on farmland within peri-urban and urban areas. Urbanization generates a range of pressures that result in changes in the peri-urban areas. The availability of a ready market in the urban areas creates the need for agricultural goods produced at the peri-urban areas. People who were previously involved in agricultural production also migrate from rural and peri-urban areas to seek jobs in urban areas, usually in the service and industrial sector. The influx of people has resulted in the need for land for housing to host or accommodate these people leading to high demand for building materials such as stones, gravel and sand for constructions within the urban and peri-urban areas. These materials are extracted from areas which were previously used as farmlands resulting in a change in land use to the detriment of farmers. As the city expands, more lands are demanded to accommodate the growing population of the city. People move to these peri-urban areas in search for relatively cheaper lands, leading to the loss of farmlands.

These pressures on land at the urban fringes lead to loss of farmland to real estate and infrastructural development. Labour for agricultural production is lost to other sectors of the economy since these sectors appear to be more lucrative than the agricultural sector. This reduces the labour force available for farming in the urban fringes, thus affecting food production.

Biodiversity and other environmental products or services provided by trees and land cover are also destroyed. A major consequence of urbanization on the peri-urban land is a rise in land values, which makes it very difficult for the poor farmers to afford. Some farmers are forced to relocate to rural areas where they can get easy access to land for farming. Others have to use the relatively

small land intensively or look for an alternative job to make a living. The relationship as stated above is showed in the figure below.

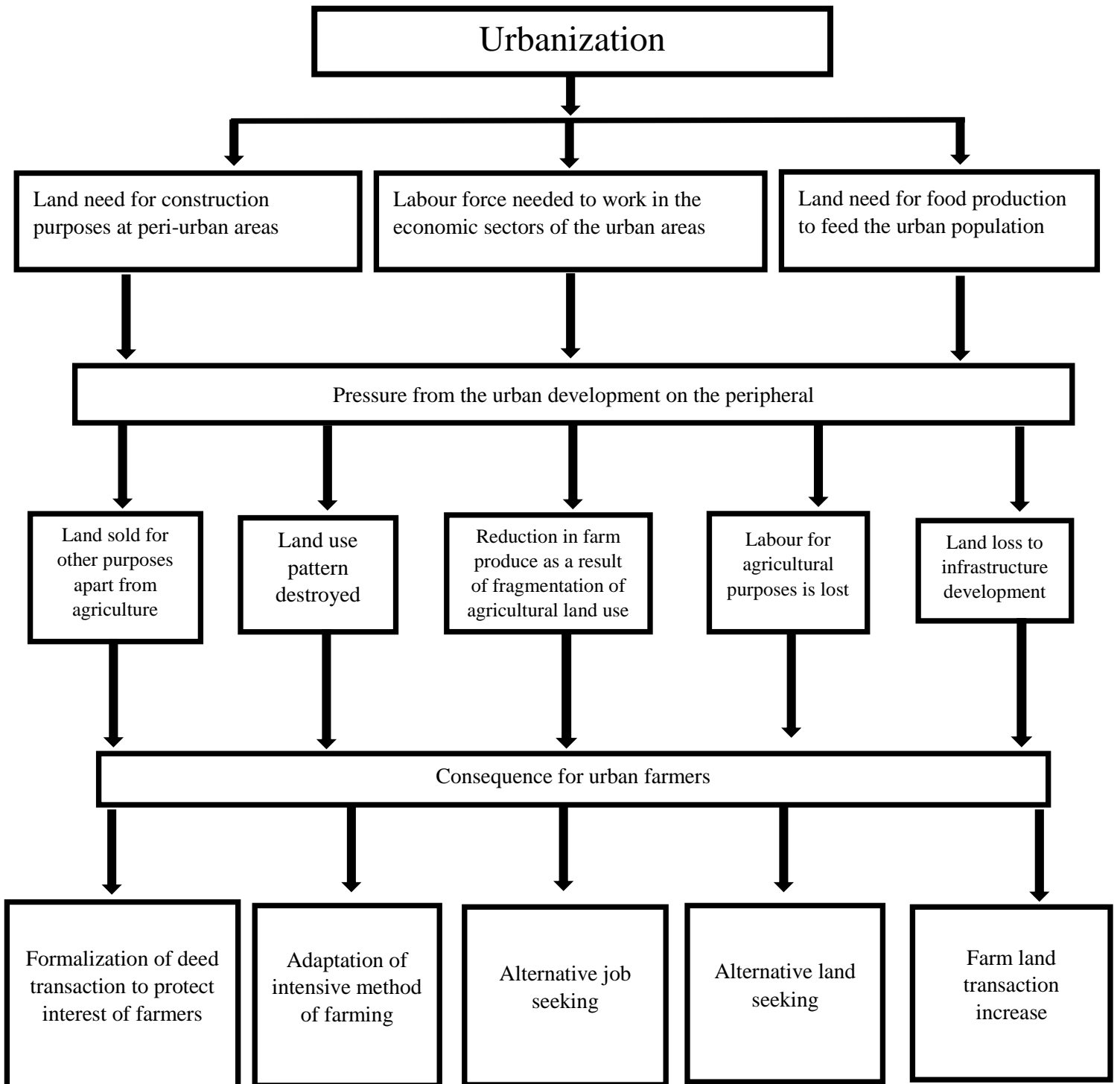


Figure 2: Conceptual framework

Source: Author's own modification based on Bryant, 1980

3.4 Study Design

This study used both quantitative and qualitative research methods to gather data. In the quantitative part of the study, a survey was conducted to administer questionnaires to the crop farmers. In the qualitative data collection, in-depth interviews were conducted with the agriculture department and physical planning department of the municipality as well as focus group discussion with three groups of farmers (of which most of them are inhabitants) under the Municipal agricultural extension programme. With a combination of the two methodologies, all the important and necessary information needed to fully understand the issues of urbanization and land availability were gathered and analysed.

3.3 Study Population

The target population in this study was farmers under the Agriculture Extension Programme in Ga East Municipality. There are many grouping of farmers in Ghana namely livestock farmers, horticultural farmers and food crop farmers among others. They all in one way or the other make use of land. The study was however restricted to food crop farmers. The municipality is noted for vegetable farming. Given the timeframe within which this research was to be conducted, it was limited to only vegetable farmers.

3.4 Sample Size and Sampling Method

Initial investigations prior to the design of the research showed that the Agricultural Department of GEMA had 300 farmers from about five areas under their extension programme. Reaching this population was difficult since the farmers are scattered on many pockets of farmland in the municipality and the roads leading to these areas were unmotorable. In order to obtain the desired sample, the study employed a non-probability sampling method known as convenience sampling.

This method involves getting the respondents wherever you find them and typically wherever is convenient. With the assistance of the staff of the Agricultural Extension Service Unit, the farmers were identified and those available were interviewed on their fields. In all, 100 farmers were interviewed.

For the qualitative interview, officials, one each from the Agricultural Department (Coordinator for Crop Farming) and the Municipal Physical Planning Office (Municipal Planning Officer) were purposively selected and interviewed. A focus group discussion was conducted in Abokobi, Sesemi and GAEC-Bohye to articulate the issues under consideration. The group comprised of inhabitants who have lived in the study area for about 30 years and over, which provided the discussion with a rich historical experience of how the land use has changed over the years. The survey recorded ten people present for the focus group discussion with six of them being females in Abokobi and Sesemi. There were fifteen people present at GAEC-Bohye for the focus group discussion with two of them being females and the rest being males.

3.5 Data Collection Procedure

The survey questionnaires were administered with the assistance of two agricultural extension officers after undergoing training to understand the questionnaire. The survey was conducted in English or a local language, depending on the respondent's choice.

A bi-weekly meeting between the agriculture extension service unit and their farmers was used as the platform for conducting the focus group discussions.

Prior to the questionnaire administration, the study objectives were explained to the respondents and those who agreed to partake in the study were asked to give a consent. Confidentiality was

ensured in the administration of the questionnaires. Respondents' identities were not used in the analysis and there was no way one could trace the responses to respondents.

3.7 Data Management and Analysis

After data collection, coding was done and data entry was done using Stata statistical package for analysis. Descriptive statistical methods were used to present the findings from the survey. Cross-tabulations were used for presenting bivariate relationships.

In order to address the first objective, the ArcGIS software was used to examine the spatial trends of vegetation cover in Abokobi for 2005, 2015 and 2017. This was done by loading near infrared and red bands. Calibration was performed on these bands to convert the image from radiance to reflectance. The Map Algebra tool, which contains the raster calculation in ArcGIS, was then used to enter the NDVI expressions. This procedure is used for generating NDVI maps and shape files of the study areas. Using the raster clip tool, the NDVI of the study area was extracted. NDVI ranges between -1 and 1, with higher values indicating denser vegetation.

In order to examine the factors influencing the availability of agricultural land as stipulated in the second objective, the study employed descriptive statistics to analyse the data gathered.

The third objective of the study is to examine the relationship between farmland availability and livelihood outcome. Income (Y) is used as proxy for livelihood outcome with area cultivated as the main explanatory variable. It is expected that the availability of agricultural land will be reflected in the area that they cultivate, after controlling for other factors. This is achieved by estimating the following equation.

$$\ln Y = \alpha + \beta_1(FMS) + \beta_2(AGE) + \beta_3(AGE^2) + \beta_4(MALE) + \beta_5(EDL) + \beta_6(MD) \\ + \beta_7(HHS) + \beta_8(SJ) + e$$

Where Y , FMS , AGE , $MALE$, EDL , MD , HHS , SJ are monthly income, size of cultivated land, age of a farmer, being male farmer (compared with female), educational level, being married, household size and secondary job respectively. α and e denote the constant term and stochastic error, respectively, and β_1 through β_8 are the coefficients of the explanatory variables to be estimated.

Table 3.1: summary of study methodology

Objective	Type of Data	Approach	Unit of Data Collection	Analytical Technique
To examine the change in land use and the availability of agricultural land in GEMA.	Primary Data	Qualitative	Crop farmers	Thematic analysis/ NDVI Data (ArcView GIS)
To examine the factors influencing the availability of agricultural land in GEMA.	Primary Data/ Secondary	Quantitative/ Qualitative	Crop farmers	Descriptive Statistics (stata)
To examine livelihood outcomes and the coping strategies in response to changes in land use in GEMA.	Primary Data	Quantitative/ Qualitative	Crop farmers	Descriptive Statistics (Stata)

Source: Author's own construct (2018)

CHAPTER FOUR

RESULTS

4.1 Sample Characteristics

The data showed that both men and women are involved in crop farming in the Ga East Municipality. However, according to the Agricultural Department of the Municipality, men dominate this sector. Out of the 100 farmers surveyed, 61% of them are males while the rest are females (Table 4.1). Gyasi et al., (2014) attributed this disparity to the fact that men own most undeveloped lands. Moreover, cultural factors may also be a reason for the male dominance since men are seen as head of households and thus control more resources including land than women do. This is consistent with Obuobie *et al.* (2006) who show that men dominate crop farming in cities while marketing of the produce is done mainly by women.

The average years of schooling is 7 with females having about a year more of schooling than males. However, there is no statistically significant difference in the years of schooling between males and females. About 19% of the respondents had no formal education. A majority of the respondents (about 59%) are characterized as having basic formal education (primary and JHS school level). Three farmers had tertiary level of education. The mean age of the farmers is 41 years, with female farmers being significantly older than male farmers, on average (about 39 versus 44 years).

Table 4.1 shows that about 82% of the respondents are married. About 61% of those that were single have never married; about 17% were divorced and about 22% were widowed. All the

widowed farmers are females. The average household size is 5.2 and there is no statistically significant difference in mean household size between the males and females.

The average farm size in the sample was 0.7 acres but male farmers cultivated about 0.2 acres more land than female farmers did, the difference being statistically significant at 1% level. The average monthly income of the sample is GHC 866 with male farmers receiving about twice the income of the females ($p < 0.01$).

Table 4. 1: Selected sample characteristics

	ALL	Male	Female	<i>t</i> -stat.	<i>p</i> -value
Education					
Years of schooling	7.0	6.5	7.7	1.34	0.181
Level completed:					
None	19%	26%	8%		
Primary	23%	21%	26%		
JHS	36%	28%	49%		
SHS	19%	20%	18%		
HND	2%	3%	0%		
1st degree	1%	2%	0%		
Total	100%	100%	100%		
Marital status					
Binary marital status (=1 if married, 0 otherwise)	82.0%	80.3%	84.6%	0.54	0.591
Of those that were single:					
Never married	61.1%	83.3%	16.7%		
Divorced	16.7%	16.7%	16.7%		
Widowed	22.2%	0.0%	66.6%		
Total	100.0%	100.0%	100.0%		
Average age of farmer (years)	41.0	38.8	44.3	2.44	0.017
Average household size	5.2	5.0	5.4	0.98	0.331
Average farm size (acres)	0.7	0.9	0.5	3.07	0.003
Average monthly income (GHC)	866	1,106	491	3.53	0.001

Source: Field data, 2018

4.2 Occupation Description

Commercial crop farming in the study area takes place around GAEC-Bohye on the way to Ashongman along the Atomic Road. The area is noted for the cultivation of vegetables such as cucumber, green pepper, cabbage and okro. Some of the farmers are part-time farmers. A study by

Sawio (1994) revealed that many urban farmers are teachers, government officials, casual labourers and the unemployed. Figure 4 shows that farming is the main occupation for half of the respondents. About 35% of the sample are self-employed with 10% being in wage employment. About 5% of the respondents are currently unemployed because they lost their farms (Figure 4).

In the case of a loss of agricultural land, women were almost equally affected as men even though more women combine farming with other activities than men do. During a focus group discussion at Abokobi, one of the women indicated:

“I was having 3 acres of land for farming just behind the Ga East Assembly, the chief sold that land to a real estate company and within a day, they pulled down all crops and they didn’t pay anything to me, so now I have resorted to trading (selling of slippers)”
(Abokobi Respondent 4, 28th June 2018).

Another woman in Sesemi said,

“Right now there is no land, the Chiefs have sold all our lands and now where we used to farm has been replaced with buildings and now I have resorted to selling food.”
(Sesemi, Respondent 1, 30th June 2018).

From the responses above, it can be seen that most of the farmers have resorted to other occupations to support their proceeds from farming activities. This change in occupation or resorting to secondary occupation was mostly found among the women. This has been as a result of the reduction in farmland size.

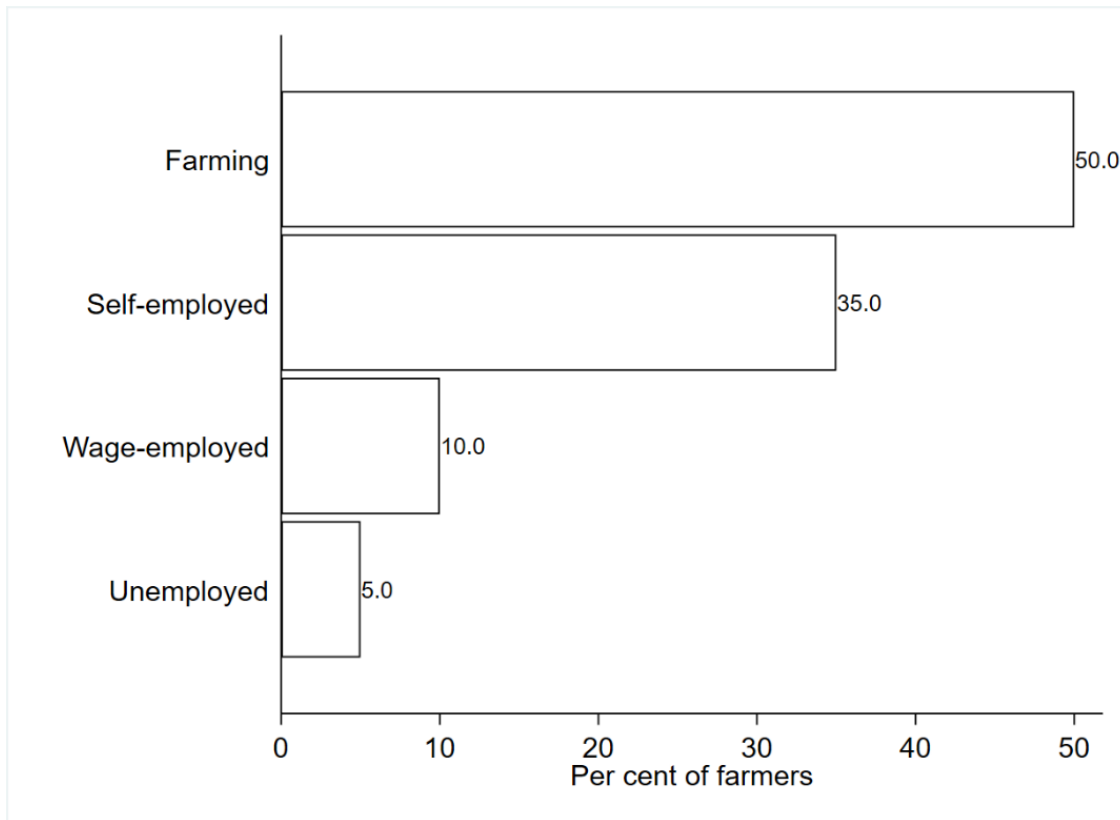


Figure 4: Occupation distribution
Source: field data, 2018

Petty trading is mostly undertaken by females. Figure 5 shows that most of the female respondents are self-employed (about 85%). They are traders, either petty trading or selling foodstuffs from their farms. This is consistent with a study by Hovorka et al. (2009) that indicated that the majority of urban women are involved in urban agriculture as petty traders of the farm produce. The survey also revealed that about 75% of the male respondents have farming as their main occupation with about 16% in wage employment. No female was engaged in wage employment.

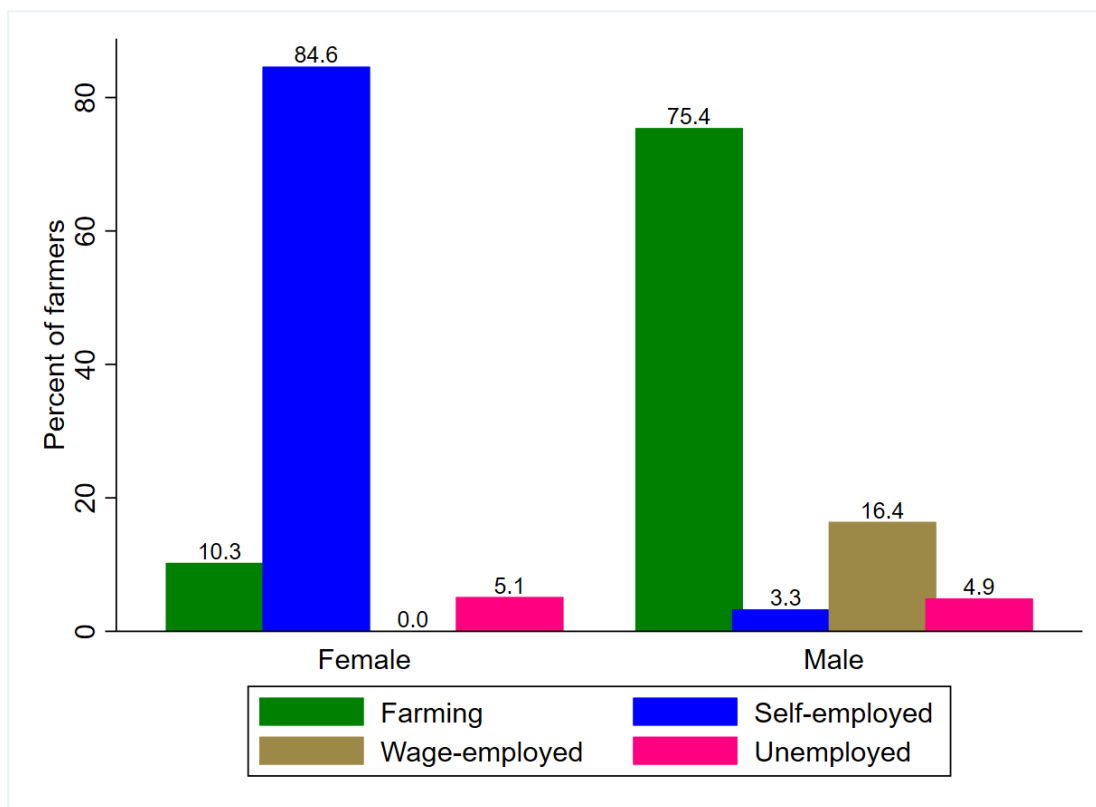


Figure 5: occupation distribution

Source: Field Data, 2018

4.3: Reasons for Farming

There are a number of reasons for someone to engage in farming in urban areas. The most important of these is the cash obtained from selling to the ready market provided in urban localities. Indeed, 90% of the respondents (98% and 77% of male and female farmers, respectively) indicated that cash income was their most important reason for farming. The cash income motive for farming is significantly more important for male farmers than it is for female farmers (χ^2 statistic = 12.15; p-value = 0.001). Figure 6 shows detailed motivation for farming by gender, showing that the food considerations are more important for female farmers than for their male counterparts. The crops cultivated by these farmers are vegetables such as cucumber, carrot, okro, green pepper and beetroot.

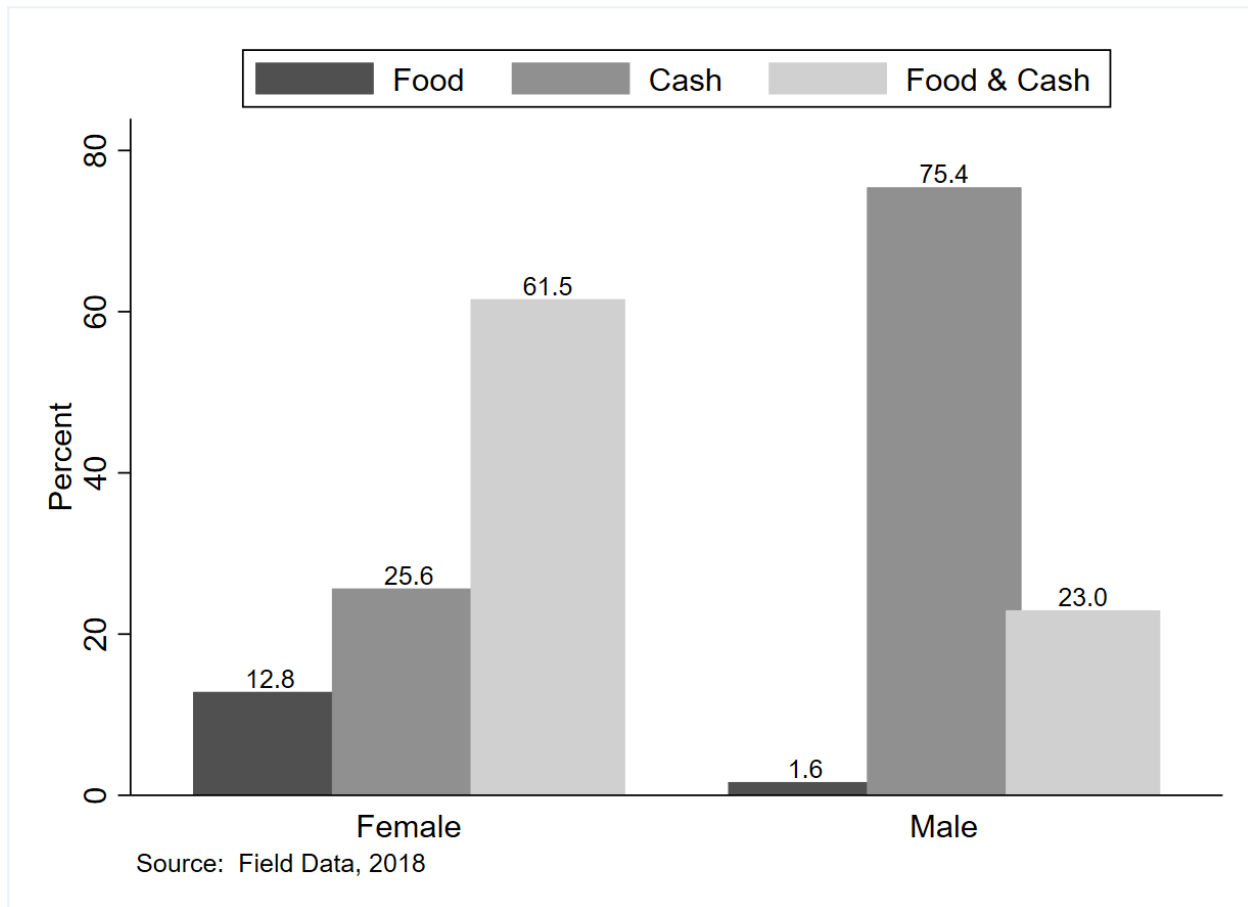


Figure 6: Reasons for farming

An important question is whether these urban dwellers still see a future in farming. The survey shows that most of the respondents (69%) desire to remain in agriculture for the next five years as shown in Figure 7. The reasons given included: access to food (29%), cash (68%) and the passion for farming (4%) as illustrated by Figure 8. For the 31% that expressed the desire to stop farming in the next five years, old age was the most important reason (70%); the other reason was scarcity of farmland (Figure 9). Hence, although farmland is scarce, it is not the main reason for quitting farming.

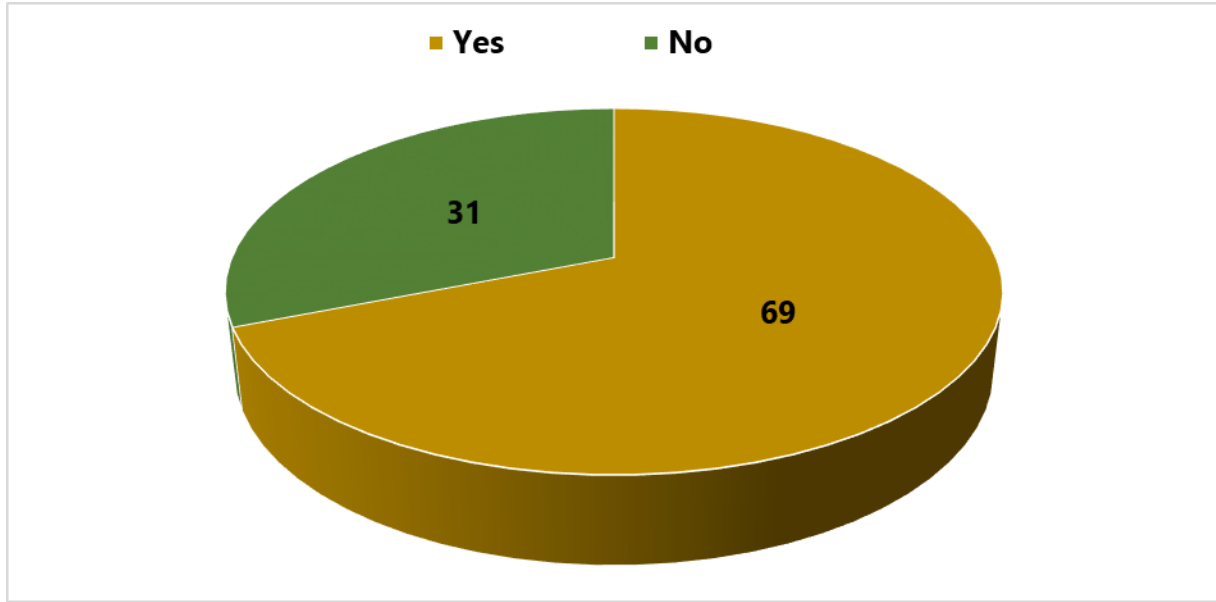


Figure 7: Respondents' desire to remain in farming

Source: Field data, 2018

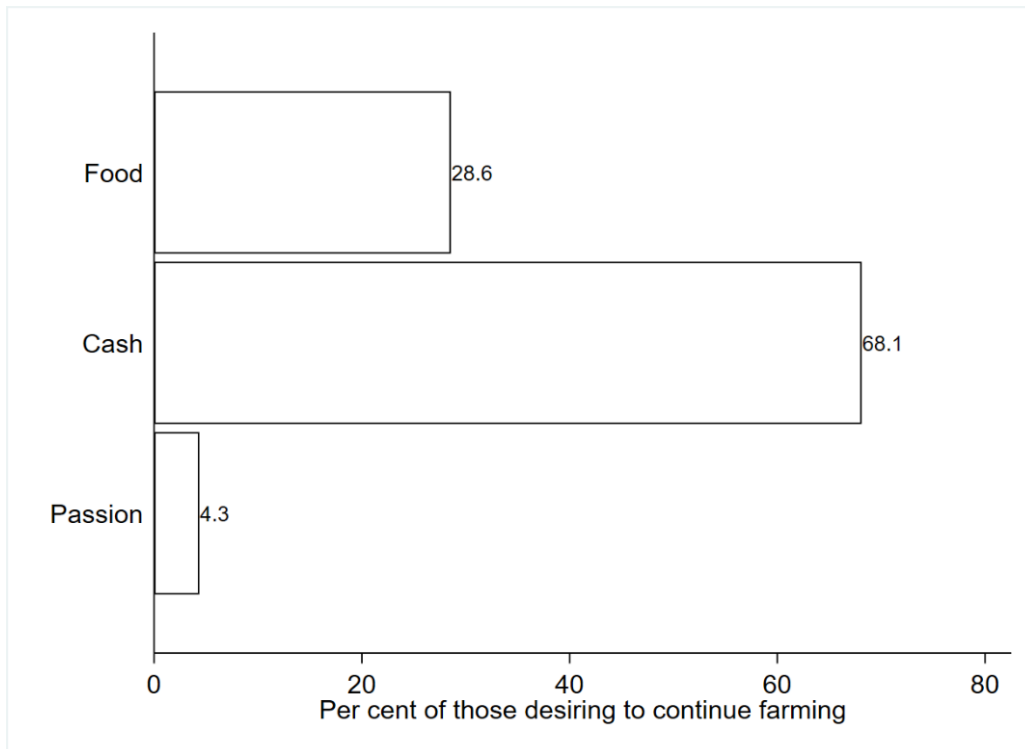


Figure 8: Respondents' reasons to remain in farming in the next five years

Source: Field data, 2018

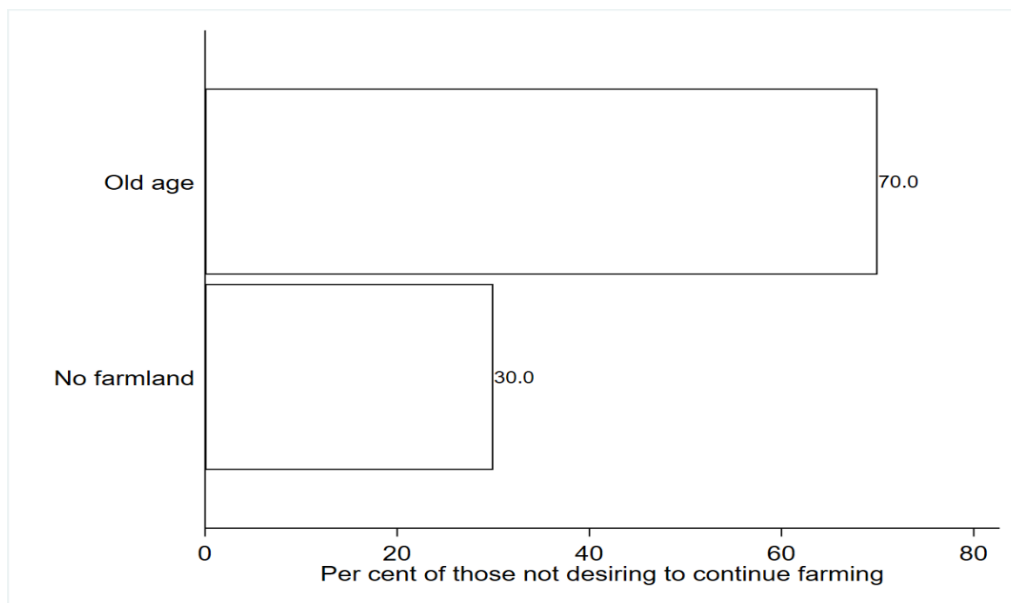


Figure 9: Respondents' reasons not to remain in farming in the next five years
Source: Field data, 2018

4.4 Distribution of Farm Size and Gender

Table 4.2 shows the distribution of farm size and the gender representation in each quintile. The average farm size is 0.2 acres for the lowest quintiles while the highest is 2.2 acres. Mean farm size of the highest quintile is about 10 times that of the lowest. Farm size increases as the quintiles increase among the males. However, the majority of the female farmers are within the lower quintiles. This suggests that most of the females (75%) are farming on small land sizes while their male counterparts are farming on bigger land sizes. This can be attributed to the patriarchal nature of our customary land owning system, where land is seen as a man’s property.

Table 4.2: Distribution of farm size in the sample

Farm size quintiles	Mean farm size (acres)	Percent male	Percent female
Lowest	0.2	25.0	75.0
2nd	0.3	61.9	38.1
3rd	0.5	69.2	30.8
4th	1.3	77.4	22.6
Highest	2.2	100.0	0.0

Source: field data, 2018

4.5 Distribution of Average Monthly Income and Gender

Table 4.3 illustrates the distribution of monthly income across five income quintiles and the gender representation in each quintile. The lowest and highest quintiles for average monthly income are GHC 148 and GHC 2,615 respectively. The percentage of males increases as the quintile increases; while the share of females decreases.

Table 4.3 Distribution of income in the sample

Income quintiles	Mean monthly income (GHC)	Percent male	Percent female
Lowest	148	21.9	78.1
2 nd	336	57.1	42.9
3 rd	531	66.7	33.3
4 th	1268	100.0	0.0
Highest	2615	76.9	23.1

Source: Field data, 2018

Figure 10 shows the density plot of monthly income by sex of farmer which is distinctly skewed to the left for females. The majority of female farmers have monthly income below GHC 1,000; while the income of male farmers is fairly normally distributed. This shows a significant difference in average income between males and females.



Figure 10: Kernel density plot of monthly income by sex of farmer

Source: Field data, 2018

4.6 Mode of Land Acquisition

Land tenure security has implications for farm investment (Ayamga and Dzanku, 2013). Land title, for example, could be associated with credit access, higher land values and higher investment (Feder and Nishio, 1998). Table 4.4 shows that a majority of the respondents (83%) are tenants on their farmlands. These tenant farmers are mostly caretakers of developing sites. This implies that they have no formal title to the land they are using for farming. Figure 12 shows that 66% of tenants pay cash as a form of rent to their landowners for the use of the land; while the rest used part of their farm produce as a form of payment. Although most of the farmers are tenants and have no formal titles, about 22% of them claim to have written deeds; while 74% of them have oral agreement with their land owners as indicated by figure 11.

Table 4.5 shows that a higher proportion of female farmers (about 90%) than male farmers (72%) have no form of written agreement or documentation over their farmland. This difference is statistically significant at the 5% level. (p-value = 0.035).

Table 4.4: Association between the acquisition of farmland and sex of respondent

	Male		Female		Total
	n	%	N	%	
Own land	10	16.39	7	17.95	17
Tenant	51	83.61	32	82.05	83

Pearson chi2(1) = 0.0408 Pr = 0.840

Source: Field Data, 2018

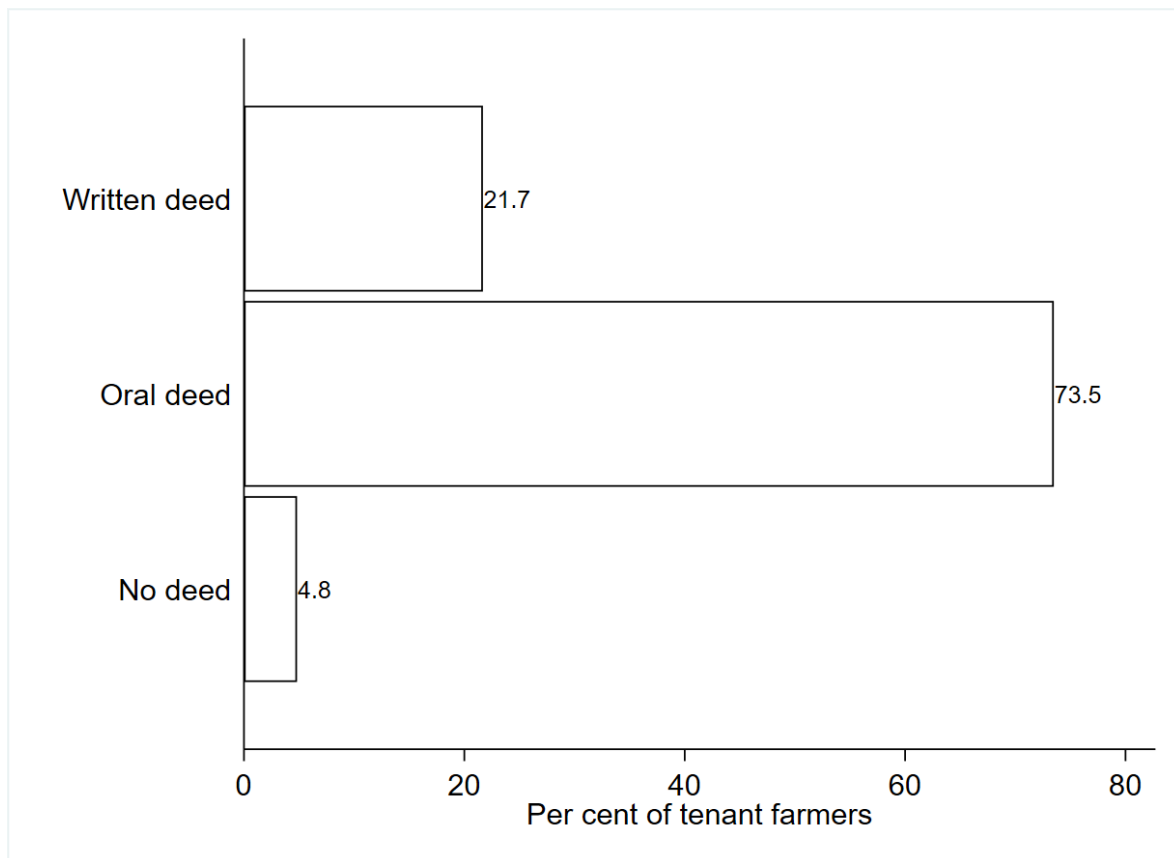


Figure 11: Types of Agreement

Source: Field Data, 2018

Table 4.5 Association between the gender and forms of agreement

	Male		Female	
	n	%	n	%
Written Deed	17	27.9	4	10.3
Oral Deed	26	59.0	30	76.9
No Deed	8	13.1	5	12.8

Source: Field Data, 2018

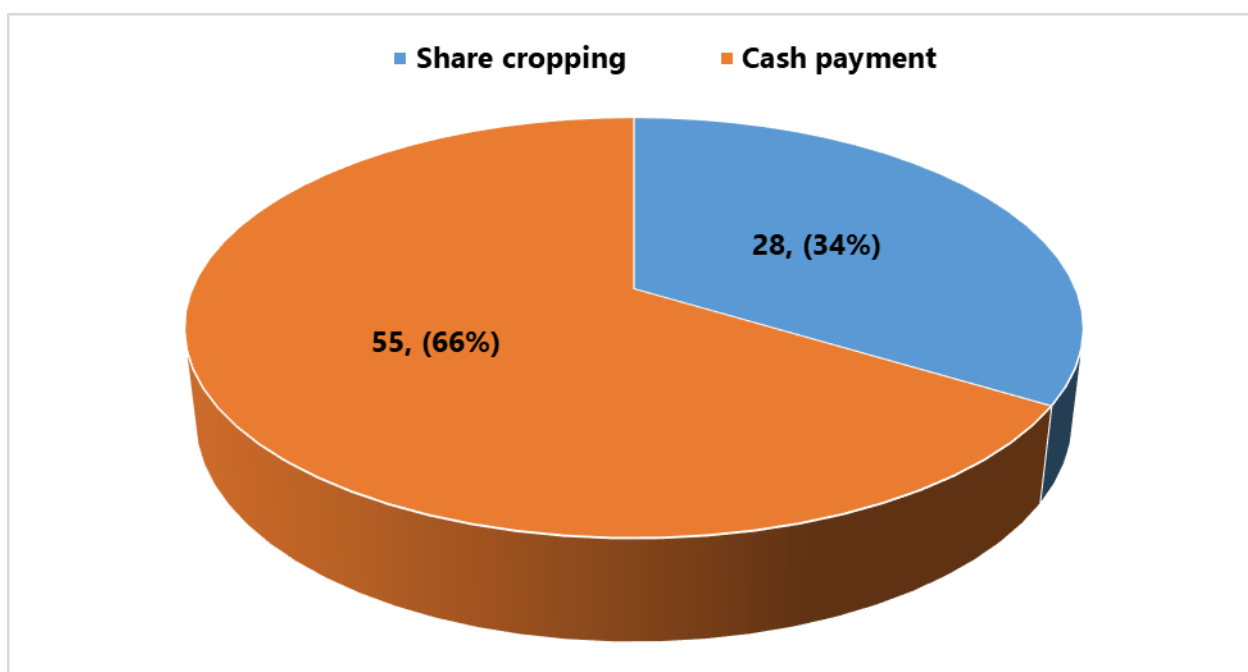


Figure 12: Mode of payment

Source: Field Data, 2018

4.7 Changes in Land Use and Availability of Agricultural Land

The first objective seeks to examine changes in land use. This is done by comparing NDVI values for 2005, 2010 and 2017. Figure 13 shows a gradual loss of arable land cover to more brown spaces (building and road construction) as expressed in the NDVI values (0.065 to 0.138) for 2005. The year 2010 recorded more depletion of the green vegetation with NDVI values of -0.196 to -0.061

which indicates that the green areas within the municipality were being lost. The most current year, 2017, experienced further depletion of green areas in Ga East Municipality as shown by the values ranging from (-0.195 to -0.060). This shows that the vegetation cover suitable for crop farming is lost to real estate construction. This may have repercussions for smallholder farmers who depend on crop farming.

From focus group discussion, it was revealed that the Abokobi area was noted for agricultural production in commercial quantities in the 1970s. Much of the food that feeds the Greater Accra region was from Abokobi. At the time, land was acquired by presenting drinks as a token to the chief of the area. A 60-year-old woman said:

“... we came here around the 1970s. We heard that this area was good for agriculture. My husband and I settled here and we also started growing cassava, garden eggs, yam, tomatoes, and groundnuts. **“(Respondent 1, Abokobi, 28th June 2018).**”

Another respondent in Sesemi also added:

“About 30 – 35 years ago, all this place was bush. There were many farms in this area” **(Respondent 1 in Sesemi, 30th June 2018).**

Currently in the study area, the mode of acquiring land for agricultural purpose is through purchase and renting (tenancy). Another respondent had this to say about the mode of land acquisition about 35 years ago;

“ ... you just had to present a drink to the chief and you are given land to farm” **(Respondent 2 in Sesemi, 30th June 2018)**

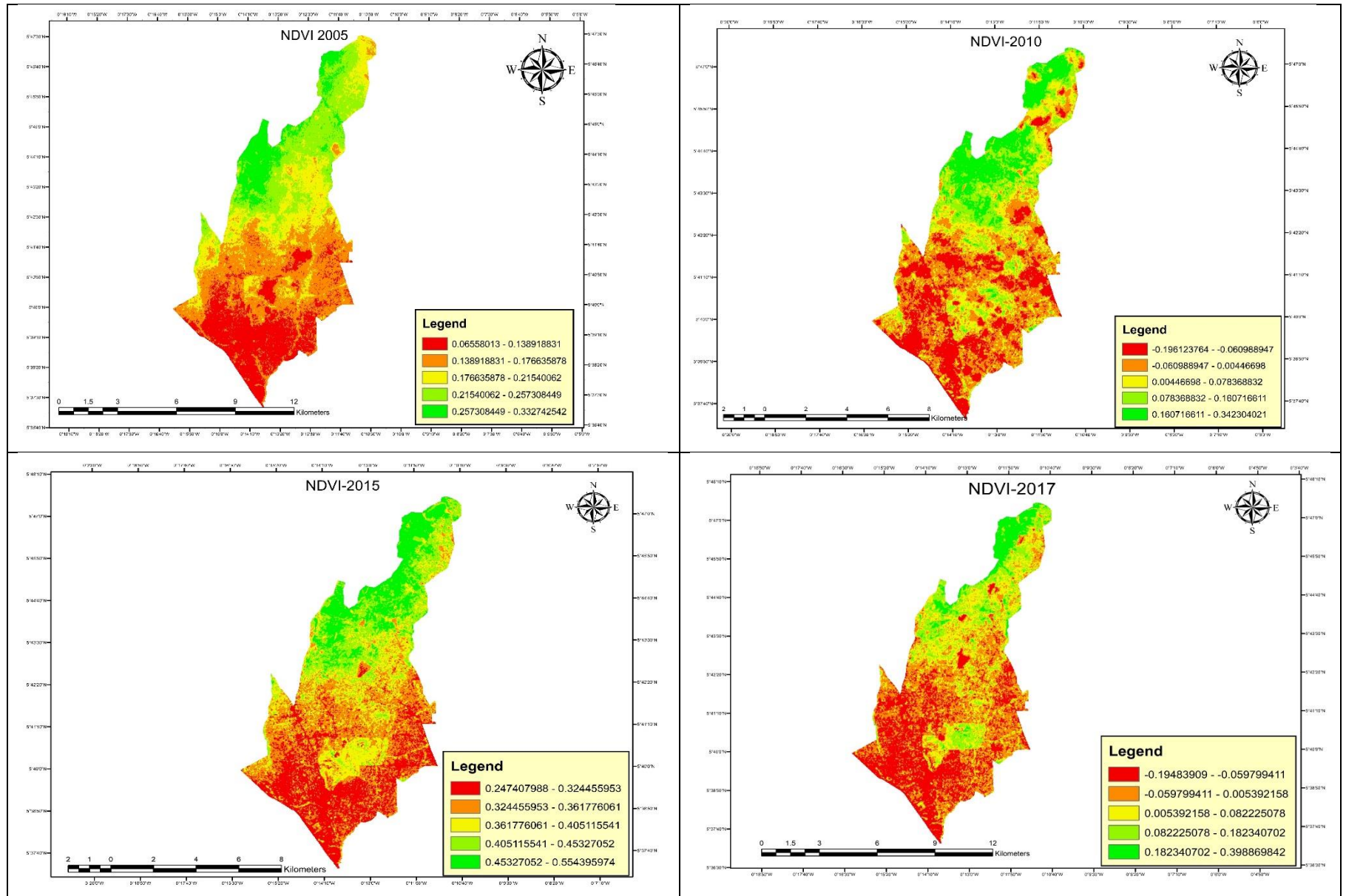


Figure 13: Normalized Difference Vegetation Index (NDVI) of GEMA – 2005-2017
 Source: Satellite image (Geography and Resource Development. University of Ghana, 2018)

As Accra expanded and became more urbanized, people started moving to the urban fringes including Abokobi. Migrants who could not afford the high rent in the city of Accra ended up in the peripherals of the city. This however, raised the land prices. This was revealed in a focus group discussion at Abokobi:

“With the influx of people into Accra, a lot of them started moving here. This created high demand for land. The chiefs started selling our farmlands” (**Respondent 1, Abokobi, 28th June 2018**).

The high demand for land for other activities has led to a reduction in the land sizes for farming activities. This was revealed during the focus group discussions.

“Right now there is no land, the Chiefs have sold all our lands and now where we used to farm has been replaced with building” (**Sesemi, Respondent 1, 30th June 2018**).

4.8 Factors Affecting the Availability of Farmland

The second objective is to identify factors that influence the availability of land for farming in Ga East Municipality. All the sampled farmers reported losing some farmland to other land uses. The most common reason for the loss of farmland is building or real estate construction (figure 14). Table 4.6 shows that about 58% of the respondents lost their farmlands to real estate construction. Aside building construction, 36% of the respondents reported that their farmlands were taken over by their land owners.

Table 4.6: Reasons for farmland lost

	Male		Female		ALL
	n	%	n	%	
Real estate construction	35	57.4	23	59.0	58
Unable to pay rent	6	9.8	0	0.0	6
Taken over by owner	20	32.8	16	41.0	36

Source: Field Data, 2018

According to the respondents as showed by figure 14, the most important reason for the scarcity of farmland is building construction (79%), followed by cattle grazing (11%).

During a focus group discussion, this is what some of the respondents had to say on the activities of real estate companies.

“We used to farm over there (pointing to flats of residential bungalows). I was having 3 acres of vegetable plantation. This real estate company just came to destroy all my produce without notice of entry or compensation for the destruction” (**GAEC-Bohye, Respondent 1, 7th July 2018**).

Another respondent also indicated:

“Initially my farms were at the other side (pointing to an ongoing building construction site which is presumed to be a new hospital for the municipality). About 4-5 years ago, they came to destroy all the crops without given us any compensation. We had invested hugely in this project but we run at a loss” (**GAEC-Bohye, Respondent 1, 5th July 2018**).

In Sesemi, this is what one woman said about the cattle destruction:

“The problem we face now on our farms is the issue of cattle grazing. The cattle also destroy the little crops we plant in our backyard gardens and building plots” (**Sesemi Respondent 5, 30th June 2018**).

Again, one respondent pointed out that

“My ripped crops were just destroyed by cattle from Mamana (another village close by). I did not get anything for my toil” (**Sesemi Respondent 6, 30th June 2018**)

Responses gathered through the focus group discussion revealed that respondents have lost a large chunk of the farmlands, hence their investment into these activities have also been lost. These could be attributed to the activities of real estate construction and cattle grazing in the municipality.

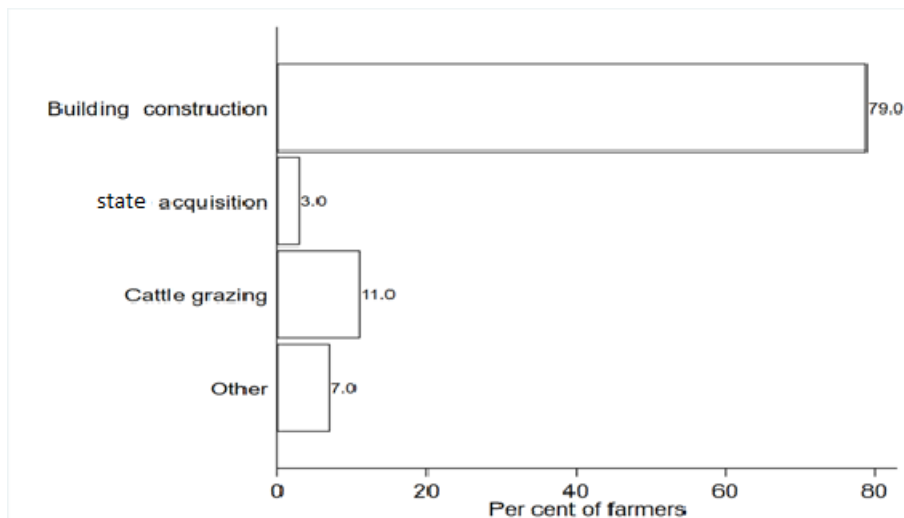


Figure 14: Perceptions of threats to farmland availability

Source: Field Data, 2018

Further, the study examined the extent to which this loss of the availability of arable lands has affected income. More than half of the respondents (56% shown by table 4.7) indicated that the loss of farmland, due to the change in land use had a very severe effect on their income. A higher proportion of female farmers (69%) than male farmers (48%) indicated that their incomes were very severely affected by the change in land use. This difference between sex of farmers is significant at 5% level (p -value = 0.033).

Table 4.7: Association between activities and the extent of the effect on farmers' income

	Male		Female		ALL
	N	%	n	%	
Very severe	29	47.5	27	69.2	56
Severe	24	39.3	10	25.6	34
Moderate	8	13.1	2	5.1	10

Source: Field Data, 2018

4.9 Livelihoods Outcomes

Table 4.8 reports the regression results that examine the relationship between farmland scarcity and income. This addresses the third objective of the study. The Breusch-pagan χ^2 statistic shows that the homoscedasticity assumption is not violated (p-value= 0.671); there is no statistically significant evidence of heteroscedasticity. The R-square value of 0.668, means that 66.8% of the variation in income is accounted for by the explanatory variables, which is high for cross-sectional data, meaning that the model fits well.

The results show that a 1% increase in size of land cultivated is associated with about 0.8% increase in average monthly income, holding other factors constant. The estimated elasticity of income with respect to cultivated area is statistically significant at the 1% level. This suggests that the larger the size of cultivated land, the higher the monthly income of the farmer. The study acknowledges the fact that rich farmers or farmers who have money may be able to rent or acquire more farmlands, making the land variable in the income model potentially endogenous. However, the study is not able to deal with this potential problem because of the small sample size and the unavailability of an appropriate instrumental variable. This result should therefore be interpreted with caution.

Holding all the other variables constant, the average monthly income of a male farmer is higher than that of a female farmer by approximately 94%. This difference is statistically significant at 1% level. The results also show that income increases with age up to a point and then begins to decrease with further increase in age. This result is consistent with the life-cycle hypothesis. Controlling for all the other variables, years of schooling is positively associated with monthly income. However, this association is not statistically significant. Similarly, being married is not significantly associated with income.

Table 4.8: Determinants of livelihood outcomes

Variables	Log(monthly income)
Intercept	5.021*** (0.909)
Log (size of cultivated land)	0.760*** (0.113)
Male farmer	0.940*** (0.208)
Age of farmer	0.088* (0.047)
Age of farmer squared	-0.001** (0.001)
Years of schooling	0.005 (0.015)
Married	-0.062 (0.169)
Household size	-0.081** (0.039)
Has secondary job	0.273* (0.161)
Observations	95
F (8, 86)	28.14
P-value of F-stat	0.000
Breusch-pagan/crook-weisberg test for Heteroscedasticity (χ^2)	0.18
P-value of Heteroscedasticity	0.671
R-squared	0.668

Heteroscedasticity robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Field Data, 2018

The results show a statistically significant negative association between income and household size at the 5% level. Adding another person to the households is estimated to decrease average monthly income by 8.1%.

Holding all the other variables constant, having a secondary job is significantly associated with higher average income at 10% level. The estimated average difference in income between a farmer who has a secondary job and one who does not is about 27%.

Thus, the regression results in this study shows that there is a direct relationship between average income of farmers and cultivated land size. This implies that as the cultivated land size of farmers reduces, their average income also reduces. This means that farmland loss due to change in land use could have a negative effect on urban farmer income.

The study went on further to examine the effects of urbanization on farmers' livelihood by asking them how often they found it difficult feeding their households. About 90% (figure 15) of the respondents indicated that there were times when they had difficulty feeding their families because of loss of farmlands.

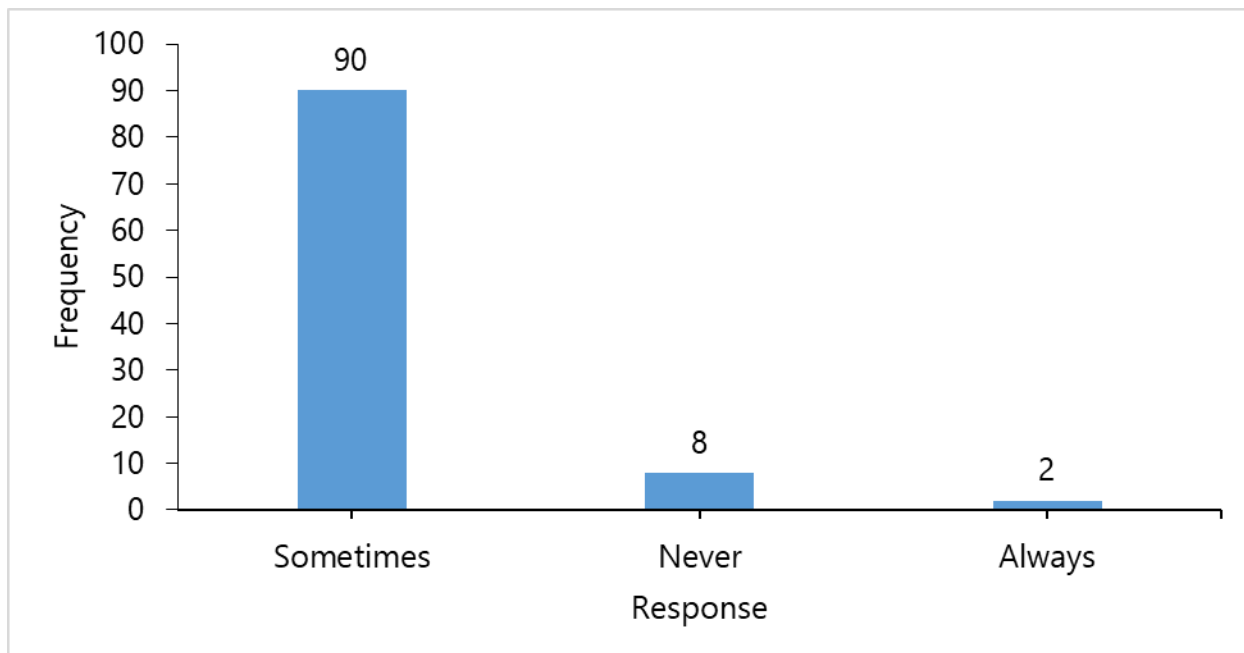


Figure 15: Respondents' perception of difficulties in family food needs

Source: Field Data, 2018

4.8 Coping Mechanisms

The third objective of the study also seeks to investigate the coping mechanisms or measures adapted by the farmers to cushion themselves because of the loss of their farmlands. Figure 16 shows that about 44% of the respondents have alternative jobs. Most of the farmers in the study area are part-time farmers who also work as carpenters, masons, plumbers, and petty traders. Some of the farmers (35% in figure 16) work on other farms within and outside the municipality. A study by Bugri et al (2017) revealed that the relocation of farmers to other farmlands affect their productivity and income as several hours are spent travelling from one farm to the other on foot or spending a portion of their income on transportation.

Some of the farmers (12%) adopted intensive farming practices involving the simultaneous production of different crops all year round. These farmers use irrigation systems and fertilizers to ensure that they cultivate crops throughout the year. Some farmers (9%) indicated that they had to sell their productive assets and use the proceeds as a coping strategy.

In a focus group discussion, the following measures were observed.

“After the death of my husband, his family took over the land we used to farm on. Now I don’t have any place to farm so I sold my husband’s motorbike for money to feed the family” (**Sesemi Respondent 3, 30th June 2018**)

“Because I lost an acre of the land I am working, I have to learn a new trade (carpentry) to help support me and the family”(GAEC, **Respondent 4, 5th July 2018**)

“I used to work with my brother but now we had lost three quarters of our farmlands, hence he has to seek another job (plumbing)”(GAEC, **Respondent 5, 5th July 2018**)

Responses from the focus group discussion showed that the respondents have resorted to alternative occupation and sale of personal assets.

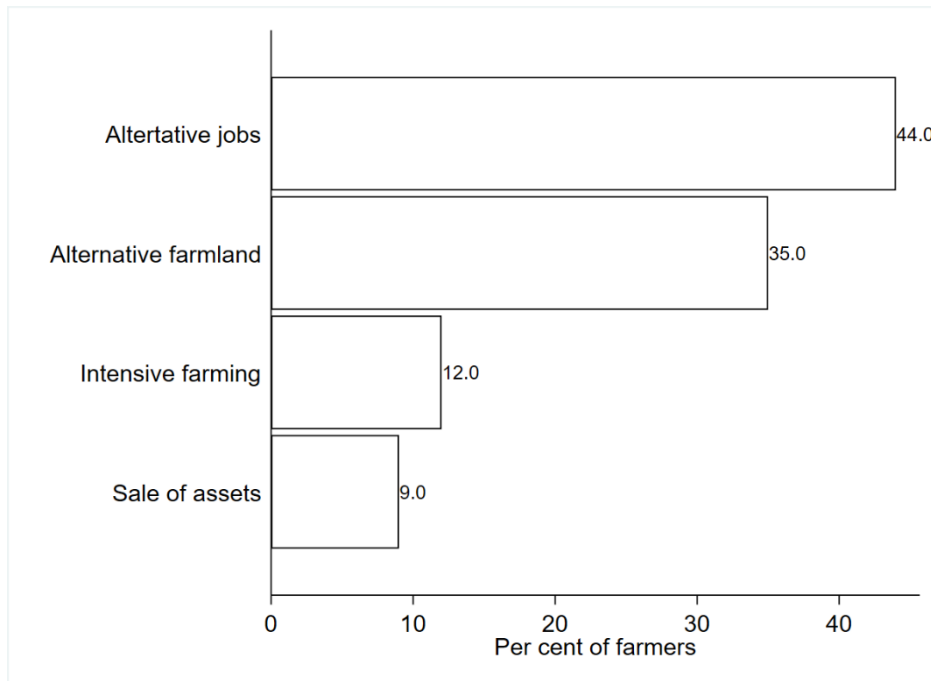


Figure 16: Coping strategies employed by respondents

Source: Field Data, 2018

4.10 Knowledge on Urban Agricultural Planning

Incorporating urban agriculture in the spatial planning of the municipality, it was revealed in an interview with the physical planning director that agricultural land use is not incorporated in the planning scheme of the area. She pointed out that no land or area is reserved for agricultural purposes. However, a large tract of land at GAEC is being used for farming. This was realized through an interaction with the agricultural extension unit of the Agricultural Department of the assembly. It was revealed that the Ghana Atomic Energy Commission released a portion of their land to farmers for vegetables cultivation.

In an interaction with the coordinator for crop farming under the Agricultural Department of the assembly, it was revealed that the number of farmers within the municipality has reduced drastically.

She attributed the reduction to the loss of suitable farmlands. With this background, farmers were asked to indicate whether they know of any area within the municipality reserved for farming. Out of 100 respondents, 91 of them indicated that they do not know of any place reserved for farming. The remaining 9% were of the view that, the GAEC lands are the areas they believed is reserved for farming. Given that 55% of the economically active population of the municipality are farmers, according to their composite budget report of 2016, an important question is, where these farmers are expected to obtain land for farming.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Land use in the Ga East Municipality has changed drastically from agriculture to real estate construction. The rate of the loss of arable land has intensified in the last fifteen years because of urbanization as shown by the NDVI data. This change has resulted in the scarcity of land for farming. This has also affected the farm size. Most of the farmers acquired their farmland through rental agreement, whereby some of the farmers are either paying cash or using produce from their farms as a form of payment. A majority of these rental agreements are under oral deed. This implies that the farmers' land tenure security is not assured because they can be evicted at any time under the wishes of their landowners. The risk of eviction seems higher for female farmers than male farmers because they are less likely to have a written deed over their farm land.

The study also revealed that a major opposing land use activities to urban farming in the peri-urban and urban localities is real estate development as also found by Gyasi et al., (2014). The results also showed that cattle grazing affects crop farming in the municipality. Qualitative interviews with the Agricultural Department of the Ga East Municipal Assembly revealed that the number of farmers under their extension programme has reduced. The department attributed this to the loss of farmlands, which has kicked out most of the farmers to seek other jobs. Yet, farming remains the main occupation for about 50% of the survey sample.

Moreover, the reduction in size of cultivated area has made almost all the farmers to seek other jobs either supplementary or primary. This reduction in farm has an effect on food insecurity. Most of the young farmers who are now working on reduced land sizes have resorted to other jobs such

as plumbing, carpentry, masonry, security services and trading. Some of the farmers have secured other farmlands within and outside the municipality for their farming activities. The study revealed that there is no area purposely reserved for agricultural land use within the municipality.

The results showed a positive association between size of land cultivated and income. This suggests that loss of farmland could have negative consequences for urban farmers. The study also revealed that the average income of a male farmer is higher than a female farmer. The results also show that the income of a farmer increases with age up to a point and then begins to diminish with further increase in age. Aging was mentioned as one of the reasons for seeking to exit farming.

Some of the farmers have adapted intensive farming methods because of the reduction in the size of farmland. They use fertilizer and irrigation to ensure that they utilized the small farm size efficiently. The farmers are also engaging in secondary jobs as a strategy against farmland loss. Almost all the female farmers have petty trading as a secondary job.

5.3 Recommendations

Firstly, in order to ensure credible access to farmland, it will be prudent for farmers to have a written deed or agreement with their landowners. This deed should state the terms of usage of the farmland, which could include the duration of usage, type of crops to be cultivated and the rent which has to be paid. The Lands Commission should recognize farmland under tenancy so that the interest of tenant farmers can be protected for a stipulated time. With this, the financial institutions can give credit opportunities to farmers by just using their farmlands as collateral.

In addition, district assemblies should incorporate agricultural land use in their planning schemes in order to sustain the livelihoods and improve food security. This can be done through a coordination between the Department for Agriculture and Physical Planning Department.

Finally, farmers adapting the intensive farming system should be supported with subsidized irrigation system and fertilizers to enable them to cultivate all year round. The Planting for Food and Jobs' policy should identify these farmers to provide them with reliable and regular technical assistance through extensions. There is also the need to move the focus of urban farming to greenhouse farming technologies which will encourage intensive farming for high end revenue and incomes with the use of less land.

Also, a study devoted solely to animal farming in the urban areas would be worthwhile since the cattle grazing, according to this study, posed a threat to urban crop farming, hence food security.

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Appendix 1: Questionnaires for crop farmers

UNIVERSITY OF GHANA, LEGON

INSTITUTE OF STATISTICS, SOCIAL AND ECONOMIC RESEARCH

MA IN DEVELOPMENT STUDIES DISSERTATION

QUESTIONNAIRE GUIDE FOR CROP FARMERS IN THE GA EAST MUNICIPAL

This Research Instrument is designed to seek relevant primary data for the conduct of an academic study on the “EFFECTS OF URBANIZATION ON THE AVAILABILITY OF LAND FOR CROP FARMING: A CASE STUDY OF GA EAST MUNICIPAL ASSEMBLY.” Your support and co-operation are very much anticipated.

Community..... Name of interviewee.....

Date of administration

A. Socio-demographic characteristics of the household respondents

1. Sex : 1. Male [] 2. Female []

2. Please, what is your age (in years)?

3. What is your highest level of education completed?
 1. None [] 2. Primary 1 [] 3. Primary 2 [] 4. Primary 3 [] 5. Primary 4 [] 6. Primary 5 [] 7. Primary 6 [] 8. Junior High school 1 [] 9. Junior High school 2 [] 10. Junior High school 3 [] 11. Senior High School 1 [] 12. Senior High School 2 [] 13. Senior High School 3 [] 14. 1st Degree [] 15. Masters Degree []

4. Marital status
 1. Married [] 2. Single [] 3. Divorced [] 4. Widowed []

5. How many people in your household are;
 1. below 14 years of age [] 2. Between 15-64 years [] 3. Above 65 years []

6. What is your main occupation?

1. Trading [] 2. Farming [] 3. Plumbing [] 4. Carpentry [] 5. Teacher [] 6. Security officer [] 7. Food vendor [] 8. Other (specify)

7. Do you have any secondary occupation? 1. Yes [] 2. No []

8. If Yes to Q7, kindly indicate.....

9. What is your average monthly income?

10. If unemployed which industry were engaged in before you became unemployed?

1. Service [] 2. Agricultural [] 3. Industry []
4. Construction [] 5. Other []

11. How many years have you been farming?

12. How many farms do you have?

	How did you acquire it	Size of Farm (in acres)	Terms of Ownership
Farm 1			
Farm 2			
Farm 3			

(Terms of ownership: 1= Tenancy 2= Freehold 3= Leasehold)

13. What is your main reason for farming?

1. For food [] 2. for cash [] 3. Both food and cash []

14. Food and cash, which one is more important?

1. For food [] 2. for cash []

15. How did you acquire your main farmland?

1. Customary freehold or from citizenship of the locality []
2. Tenancy share cropping []
3. Tenancy renting or hiring []
4. Matrilineal inheritance []

5. Patrilineal inheritance []

6. Purchase []

7. Other (Specify)

16. Are you paying anything for the use of the land? 1. Yes [] 2. No []

17. If yes to Q16, please indicate appropriately.

1. Sharecropping [] 2. Tenancy renting/hiring [] 3. Other, specify

18. Is your farm covered by any formal agreement?

1. Yes with a written deed [] 2. Yes with an oral a deed [] 3. No []

19. What other activities have affected the availability of farmlands in your locality?

1. Road construction [] 2. Building Construction [] 3. Sand winning [] 4.

Government acquisition [] 5. Others (specify)

20. From Q19., which one is the most severe?

21. How has it affected your farm?

1. Extremely High [] 2. High [] 3. Moderate []

4. Low [] 5. Extremely Low []

22. Have you ever lost a farm? 1. Yes [] 2. No []

23. If yes to Q22, how did you lose the farm?

1. For construction purpose [] 2. Unable to pay rent [] 3. Owner takeover []

24. Did the loss of your farm affect your income? 1. Yes [] 2. No []

25. If yes to Q24, to what extent has the loss of your farm affect your income?

1. Very Severe [] 2. Severe [] 3. Moderate []

4. Low [] 5. Very low []

26. How do you compare the overall economic situation of the household from the time you lost your farmland to now?

1. worst now [] 2. worse now [] 3. Same [] 4. Little better now [] 5. Much better now []

27. How often since you lost your farmland did you have problems satisfying the food needs of your family?

1. Never 2. Sometimes 3. Always

28. How did you deal with the loss of your farm?

1. Alternative job [] 2. Alternative farmland [] 3. Intensive farming []
 4. Productive asset sale [] 5. Other, specify

29. Has your landlord changed your tenurial arrangement in the past 5 years? 1. Yes [] 2. No []

30. If yes how has it changed?

31. How was the change in the tenurial arrangement? 1. Favourable [] 2. Not favourable []

32. Do you desire to be in agricultural within this locality in the next five years?

1. Yes [] 2. No []

33. Give reasons for your answer in Q32

.....

34. On a scale of 1 – 5, rank the following as a threat to agricultural activities? (*1 means extremely high, 2 = high, 3 = moderate, 4 = low, 5 = extremely low*)

Threat		Rank
a	Lack of credit	
b	Buildings	
c	Alternative jobs	
d	Unavailability of farmland	
e	Cost of acquiring land	
f	Poor soil fertility	
g	Other (Specify)	

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35. In your view what can be done to protect agricultural land?

.....

.....Do you know of any area within this locality which has been reserved for agricultural activities?

1. Yes []

2. No []

36. Do you agree that agricultural land should be part of urban planning? 1. Strongly disagree []

2. Disagree [] 3. Don't Know [] 4. Agree [] 5. Strongly agree []

37. Do you agree that the district assembly has a role to play in this? 1. Strongly disagree [] 2.

Disagree [] 3. Don't Know [] 4. Agree [] 5. Strongly agree []

38. If yes what role?

.....

.....

Appendix 2: Focus group discussion

UNIVERSITY OF GHANA, LEGON

INSTITUTE OF STATISTICS, SOCIAL AND ECONOMIC RESEARCH

MA IN DEVELOPMENT STUDIES DISSERTATION

FOCUS GROUP DISCUSSION FOR CROP FARMERS IN THE GA E MUNICIPAL

This Research Instrument is designed to seek relevant primary data for the conduct of an academic study on the **“EFFECTS OF URBANIZATION ON THE AVAILABILITY OF LAND FOR CROP FARMING: A CASE STUDY OF GA EAST MUNICIPAL ASSEMBLY.”** Your support and co-operation are very much anticipated.

Community.....

Date of administration

1. History of farming in the area
2. How this has evolved or changes over time
3. What are the factors responsible for all these changes?
4. How have you been coping with the changes?
5. How are you affected by the infrastructure development or construction activities?
6. How do you pay for the use of the land?

Appendix 3: Interview guide for Planning Unit

UNIVERSITY OF GHANA, LEGON

INSTITUTE OF STATISTICS, SOCIAL AND ECONOMIC RESEARCH

MA IN DEVELOPMENT STUDIES DISSERTATION

INTERVIEW GUIDE FOR PLANNING UNIT GA WEST DISTRICT

This Research Instrument is designed to seek relevant primary data for the conduct of an academic study on the **“EFFECTS OF URBANIZATION ON THE AVAILABILITY OF LAND FOR CROP FARMING: A CASE STUDY OF GA EAST MUNICIPAL ASSEMBLY.”** Your support and co-operation are very much anticipated.

1. What is the process involved in drawing up planning schemes for District?
2. What are the land uses incorporated in planning schemes in the district?
3. How many areas in the district are zoned for agricultural land use?
4. Is agricultural land use an integral part of the district planning schemes?
5. Does the Ga East Municipal assembly have a development control unit?
6. What is the staff strength of the unit?
7. Are they able to enforce zoning regulations in the Municipal?
8. How does the planning unit deal with haphazard developments?
9. Does the planning unit liaise with the agricultural office to identify and zone agricultural lands?
10. Can the planning unit zone areas for various uses such as agricultural without the landlord's consent?
11. What are some of the challenges facing the planning unit in drawing and implementing planning schemes?
12. How does the unit deal with the increasing physical development within the district?

13. Are any areas zoned for sand winning in the district?

14. How in your view can agricultural land use areas be protected

Appendix 4: Interview guide for the Agricultural Department

UNIVERSITY OF GHANA, LEGON

INSTITUTE OF STATISTICS, SOCIAL AND ECONOMIC RESEARCH

MA IN DEVELOPMENT STUDIES DISSERTATION

INTERVIEW GUIDE FOR AGRICULTURAL DEPARTMENT- GA EAST MUNICIPAL

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LAND FOR CROP FARMING: A CASE STUDY OF GA EAST MUNICIPAL

ASSEMBLY.” Your support and co-operation are very much anticipated.

1. How many farmers work with the agricultural extension unit?
2. Where do they farm?
3. Have your farmers increased or reduced in the last five years?
4. How often do farmers lose their farms?
5. Do you liaise with Ga East Municipal assembly to choose agricultural land to zone?
6. What is the major type of farming undertaken in the Municipal?
7. Do both women and men farmers in your view have the same access to agricultural land?
8. Is there any area in the Municipality which has been reserved for farming?
9. What are the major threats to farming in the Ga East Municipal?
10. What in your view can be done to protect agricultural land in the district?