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GHANA FEED THE FUTURE AGRICULTURE POLICY SUPPORT PROJECT (APSP)

The Impact of Land Use Pattern and Change on Farmers' Access To Land For Urban And Peri-Urban Agriculture In Ghana

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USAID

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The Impact of Land Use Pattern and Change on Farmers' Access To Land For Urban And Peri-Urban Agriculture In Ghana

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EXECUTIVE SUMMARY

In Ghana, more and more of the food needs (especially vegetables) of the urban population are being met by people farming in the urban/peri-urban areas, giving rise to what has become known as Urban and Peri-urban Agriculture (UPA). UPA is a farm and non-farm activity adopted for livelihood and domestic food security improvements. These activities have had challenges and dwindled growth over time period due to urban expansion and the lack of proper land use plans for that activity.

This study with funding from USAID-Ghana sought to identify some of the major UPA activities in the key cities / big towns in Ghana that serve as livelihood source for urban/peri-urban dwellers. It examined the major areas of production and marketing of UPA livelihood activities and assessed the profitability of the key UPA livelihood activities identified in the designated cities and towns with particular attention to the cost of inputs such as land and its tenure security. In particular, it reviewed critical and relevant policies, laws and by-laws guiding land use and access in urban and peri-urban areas, the adequacy of regulations in guiding and protecting UPA activities. Lastly, the study examined and described the changing land use patterns in each of the designated major cities and towns and their effect on the profitability and sustainability of UPA in the country. This study aims to provide a set of recommendations to influence policy that will contribute to a sustainable UPA and food security in Ghana.

Methodologically, the study adopted mixed method approaches including interviews, survey questionnaire, focus group and key informant discussions with some state institutions and UPA practitioners using a sample of 244 respondents through purposive and cluster sampling frames as well as document reviews. Gross Margin Analysis and descriptive statistics were used for the analysis.

The results indicate that policies on UPA were quite pronounced in the country's agricultural and land policy frameworks. The relevant state institutions such as MoFA, LPSA and Metropolitan, municipal and District Assemblies have been established with the requisite mandates. However, there are overlapping and competing responsibilities between these institutions. With no strong coordinated and integrated effort at harmonizing similar and cross-cutting responsibilities of state institutions on UPA, implementation of UPA policies in the field was affected. The result is that UPA has been affected as land used for agriculture in those areas have been taken over by commercial, industrial and residential development. Many farmers have been pushed to the periphery of the urban areas which are mostly infertile. The study establishes that most lands used for UPA are government owned (5.3%), owned by private individuals (27%), along streams and valleys (36%) and 8% for open spaces. The percentages of crops cultivated are Maize (29%), cabbage (16%), Lettuce (11%), Onions (10.2%) and Okoro (9%) in UPA in Ghana. The study also found out that farmers' main reason for farming in these areas were mainly to earn an income (74%), food (19%) and for both income and food (7%). In terms of land acquisition, 47% said they are farming on the land with permission and 14% without permission/squatters. About 57% claim they were not harassed, whilst 5% were constantly harassed by owners for farming on the lands.

With an average seasonal revenue of GHC 2,081.40 GHC 1,460.90, GHC 826.80 and GHC 2,657.20 for onions, cabbage, lettuce and sweet pepper respectively per hectare per farmer

in the study areas, UPA can be said to be profitable. This is because these earnings are higher than the average annual earnings of GHC340.00 reported by the Ghana Statistical Service Living Standards Survey Round 5 in 2008.

With these findings, the study recommends that;

1. MOFA, Town and Country Planning and the Assemblies should collaborate to designate agricultural lands for these urban and peri-urban areas
2. That institution like Town and Country Planning should use their regulatory powers to carry through designated areas for use
3. That government should carry out nationwide zoning of lands into UPA, real estate and industrial and lobby chiefs into it as stakeholders
4. That UPA activity should be regulated to ensure best practices and constant supply food to the urban areas
5. MOFA should establish a UPA desk at each regional office to support UPA activities
6. MOFA together with the chiefs and Town and Country Planning should liaise and ensure that only zoned and mapped lands are sold to people.

ACRONYMS

AMA	Accra Metropolitan Assembly
DA	District Assemblies
FASDEP	Food and Agricultural Sector Development Policy
FAO	Food and Agriculture Organization
GNDF	Ghana National Development Framework
GSS	Ghana Statistical Service
GoG	Government of Ghana
METASIP	Medium Term Agriculture Sector Investment Plan
LSPA	Land Use and Spatial Planning Authority
MMDAs	Metropolitan, Municipal/District assemblies
MOFA	Ministry of Food and Agriculture
NSDF	Spatial Development Framework for Ghana
NLP	National Land Policy
SPSS	Statistical Package for the Social Sciences
TDC	Tema Development Corporation
TCPD	Town and Country Planning Division
UPA	Urban and Peri-Urban Agriculture
USAID	United States of Agency for International Development

INTRODUCTION

1.1. Urban and Peri-Urban Agriculture (UPA)

Within the context of accelerating population growth rates, demographic changes, immigration dynamics and stresses on food production systems in the world especially in developing countries, millions of people have been experiencing poverty and food insecurity. Urbanization has also surged over the past decades, creating increased demand for food in the cities and big towns. However, with the slow pace of agricultural growth in the rural areas, where the bulk of agricultural production takes place, more and more of the food needs of the urban population are being met by people farming in the urban/peri-urban areas giving rise to what has become known as Urban and Peri-urban Agriculture (UPA) (Feedifuture, 2016).

> The FAO (2007) defined the UPA as;
>
> "the growing of plants and the raising of animals for food and other uses within and around cities and towns, and related activities such as the production and delivery of inputs, processing and marketing of products".
>
> Mougeot (2000);
>
> 'Urban agriculture is located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, and grows or raises, processes and distributes a diversity of food and non-food products, (re-)uses largely human and material resources, products and services found in and around that urban area, and in turn supplies human and material resources, products and services largely to that urban area.'
>
> According to Adam Gashus, (2007),
>
> 'the term urban and peri-urban agriculture (UPA) could be used to denote a "place' or "concept". As a place, it can mean a rural agriculture area, located between urban built areas in cities and predominately rural agriculture areas, and as a "concept", 'peri-urban could be seen as an interface between rural and urban agriculture activities" (Adam Gashu 2014 a: 5).

A good number of researchers (Nugent (2000, 2001); Itty (1992); Armar-Klemensu and Maxwell (2000); Fialor (2002); Danso et al. (2002b) have established the importance of UPA and its profitability to urban poor households which creates employment and source of livelihood to millions of people worldwide. For instance, Smit (UNDP, 1996) reported that nearly 800 million urban citizens worldwide are involved in urban agriculture (UA) in one way or the other. However, in terms of regional distribution of the number of people engaged in UPA, Eastern Europe and Central Asia leads with 7% of their total agricultural population engaged in UPA, followed by Middle East and North Africa 6% with Sub-Sahara Africa and Latin America and Caribbean constituting 3% each (FAO, 2001). The 3% engagement in UPA in Sub-Saharan Africa translates to over 11 million registered households involved in UPA in Sub-Sahara Africa alone, of which Ghana is inclusive. FAO posits that UPA in Sub Saharan Africa is considered to be a heterogeneous practice which spans from being small-scale in nature, market-oriented commercial vegetable growing activity or dairy farming, to a more capital-intensive form due to the locations of these farms (FAO, 2007).

The benefits of UPA to participating households and the urban food markets are enormous, with the potential to disentangle poor urban households from the bondage of poverty and make non-participating UPA farmers in the urban dweller's food and nutrition needs secured. According to Argenti (2000), food production in the city is often a response of the urban poor to inadequate, unreliable and irregular access to food and lack of purchasing power. That in urban settings, lack of income translates more directly into lack of food than in rural settings. The costs of supplying and distributing food from rural areas to the urban areas, or to import food for the cities, are rising continuously, and distribution within the cities is uneven resulting in urban food and nutrition insecurity. Also, large quantities of the food produced by the urban farmers are supplied to the urban market, amounting to 15-20% of the total world's food supply (Armar-Klemesu, 2000). UPA is thus very important because it serves to improve urban livelihoods through employment, income generation and diversification, environment, urban planning and local economic development.

The practice of UPA helps to create jobs for people in urban areas directly (farmers and market women) and indirectly (distributors, food industry) and generally ensures sustainable livelihoods. For profitability, some farmers in a season in parts of Kumasi and Accra earn from USD 400 to USD 800 with good sources of water (Danso et al. 2006). For Kessler, (2003), the annual profit for farmers in Lomé, Cotonou, Bamako and Ouagadougou, range from US$20 - US$700, depending on the UPA agronomic practices, water availability and size of farm land. Danso et al. (2003) argued that, with low cost of inputs and other variable costs, UPA farmers in these areas are likely to generate an average monthly income of US$170 - US$200 in Ghana.

From the environmental and health aspects, UPA is considered important because of the use of stagnant water in open and unused spaces for farming. This tends to reduce the incidence of breeding mosquitoes and general water pollution in urban neighbourhoods (Klinkenberg, 2008 and Chimhowu, 1993). It is argued that UPA practice helps to improve the urban waste recycling process by generating composts for productive uses from organic wastes. Such organic wastes normally arise from harvested agricultural produce and animal manure. However, the dangers of using waste and polluted water to irrigate crops cause critical health risk to consumers. Amuzu & Leitmann (1992), Akpedonu (1997) and Abdul-Raouf et al. (1993) explain that water bodies and sources for UPA in Accra, for instance, are heavily polluted with both human and industrial waste discharge, resulting in microbial and faecal contamination which poses serious health risk to people.

Notwithstanding the above contributions, the dynamics associated with political and socio-economic developments in urban areas are negatively impacting UPA. Increasing urbanization implies the need for the construction of social and economic infrastructure such as more residential buildings, markets, industries, schools, roads and health facilities. These developments are creating resource-constraints through increased competition for land and water for various uses. Furthermore, due to lack of security of tenure and rights of use, urban/ peri urban farmers are compelled to move continuously from the farm plots they cultivate and invest in through soil and water and fertility management.

From the foregoing, farmers access to land for UPA is seen to be largely been influenced by existing land use patterns in the country, trends in economic and industrial growth, and a boom in estate development and agriculture. Oftentimes, the availability of finance and other opportunities such as land availability and use rights determines the frequency of usage of land.

As generally agreed, agricultural activities and UPA in particular, are subsistence in form with small holder orientation given their minimal capacities and financial wherewithal to own urban lands for agriculture.

Despite the great potential of UPA to increase income generation for farmers and actors in the UPA value chain and general economic growth, city and urban planners have failed to purposively allocate land and to formulate appropriate urban land use policy to facilitate and protect its practice. This situation threatens the sustainability of UPA practice due to the changing land use patterns in the wake of the rapid urbanization. However, it is worth noting that UPA has come to stay and it is an issue that will continue to engage the attention of policy makers for due recognition and for appropriate policy intervention.

It is against this background that the USAID APSP and the METASIP/SAKSS Secretariat and the Faculty of Agribusiness and Communication of the University of Development Studies partnered to research into these issues with the following objectives.

1.2. Research Objectives

The main objective of the study was;

To analyse prevailing policies, laws and by-laws, as well as traditional systems of land administration, to determine how changing land use patterns and accessibility impact on UPA profitability and sustainability.

Specific Objectives

Specifically, the study seeks to achieve the following objectives;

1. To identify major UPA activities in key cities / big towns in Ghana that serve as livelihood source for urban/peri-urban dwellers
2. To establish major areas of UPA production and marketing activities
3. To assess the profitability of the key UPA livelihood activities identified in the designated cities and towns with particular attention to cost of inputs such as land and its tenure security
4. Review policies, laws and by-laws guiding land use and access in urban and peri-urban areas and the adequacy of these regulations and by-laws in guiding and protecting UPA activities
5. To describe the changing land use patterns in each of the designated major cities and towns, and their estimated effect on the profitability and sustainability of UPA in the country

1.3. Research Significance

The output of this research will benefit SAKSS NODE 2 of the METASIP which is "Increased Growth in Incomes". The policies that will be made based on evidence provided by this research will go a long way to benefit people who depend on UPA for their livelihood and other actors in the UPA value chain (such as UPA farmer organizations, marketers and consumers, lands administration, input suppliers, Civil Society Organizations, and traditional land owners) as well as consumers. The policy recommendation of this study can contribute to the food security status of the country.

CHAPTER TWO

LITERATURE REVIEW OF CHANGING LAND USE PATTERN AND EXISTING UPA POLICIES

2.1. The Nature of UPA and the Effects of Urbanisation on the Sustainability of UPA

2.1.1 The Nature of UPA

Crops such as vegetables, grains, legumes and root crops are mostly grown in UPA with vegetables dominating the kinds of crop species grown in most UPA areas. In other situations, UPA farmers' rear animals including poultry, rabbits, goats, sheep, cattle, pigs, fish, etc (RAUF Foundation, 2017) and cultivate other known agricultural products such as flowers and herbs. These activities take place in open places, reserved lands, undeveloped pieces of land, rented/leased lands and squatters (Danso et al. 2006) which normally have good sources of water from natural or from supplementary sources (dug outs, wells and boreholes). Beyond crop production and animal rearing, RAUF Foundation (2017) claims that UPA actors also engage in other skilled and unskilled jobs (public sector jobs, artisan and other vocations) to augment their income levels. Women play an important role in UPA as they are involved in all key segments of the UPA value chain such weeding, processing and marketing activities. Women participate in UPA because these activities can often be more easily combined with their other tasks in the household.

2.1.2 The Effects of Urbanisation on the Sustainability of UPA

UPA has become important in many parts of the developing world, including Sub-Saharan Africa for decades, due to accelerated urbanization (Owusu, 2008, Kassange et al, 1996, Duta, 2008). It is due to growing urban population and migration from the rural areas. The rapid urbanization over the past decades has increased demand for food in the cities and big towns (Kasange et al, 1996, Obiri-Opareh et al, 2005, Naab et al, 2013).

It has been observed that the process of urbanisation will accelerate in Sub-Saharan Africa to the extent that by 2030, about 30% of the population of Sub-Saharan Africa will inhabit urban centres (UN Habitat, 2010). In the case of Ghana, the 2010 population census indicates that Ghana`s population stood at 18.9 million in the year 2000, representing 53.8% increase over the 12.3 million recorded 16 years earlier in 1984. Currently, in 2017, Ghana's population stands at 28,646,534 people and it is expected that more of the people will be engaged in UPA.

With the foregoing as a background, a number of researchers (Kuusaana et al 2015, Naab et al 2013, Nsia- Gyabaa, 2000) have found a relationship between rapid urbanization, access to land and the sustainability of UPA in cities and towns in Ghana. A study by Kusaana et al (2015) on peri-urbanization and food systems in Ghana, shows that, as urbanization increases, farmers are pushed into less favourable locations where they continue production. This implies that rapid urbanization leads to "push and pull" effects, which influence land use decisions by smallholder farmers. The "push" effect refers to the displacement of smallholder farmers away from their urban farms to the peripheral areas due to the expansion of cities and towns. This means that as lands in the urban centres are taken up for industrial and commercial activities, the only available lands for UPA can be found at the fringe areas of the

cities /towns. The "pull effect" is the income and survival necessity that drives smallholder farmers to cultivate the lands available in the peripheral areas in order to earn a livelihood. This situation prevails because as Alonso (1964) has argued, growth in the urban population happens without an equivalent growth in land supply and for survival, UPA farmers have to cultivate available land at the periphery in the absence of gainful employment. The land is fixed in supply. The pressure exerted by increases in population and rapid urbanisation deprives other sectors such as agriculture of the needed land.

As Owusu and Agyei (2007) have noted, the key feature of the urbanization process is the rapid conversion of prime agriculture lands for non-agricultural purposes. This conclusion supports the assertion made by Cobbina (2012) that rural agricultural land uses are becoming converted into peri-urban land uses and ultimately urbanized at the rural-urban fringes, at rates faster than anticipated. This implies that land uses for residential, industrial commercial, civic and educational purposes tend to be more dominant than land use for agriculture in the competition for space in urban areas. This dominance tends to deprive farmers of arable land to cultivate in urban areas thereby reducing agricultural production. Concerning some of the factors motivating the conversion of agricultural lands to no-agriculture uses, Masanja (1999) observes that high economic gains from the conversion to other uses outweighs that obtained from the continued use of land for agriculture. This economic rationality of the land owners, indicates that they would opt for other activities with high returns on their lands against agriculture. Naab et al (2013) in a study estimates that, from 1990 to the year 2020, a total of approximately 14 million hectares of land (approx. 475,000 ha/yr.) in developing countries will be converted for urban purposes.

Whereas urbanization is seen as a threat to UPA, the Ghana National Development Framework (GNDF) claims that urbanization drives Ghana`s economic development and deserves to be promoted. GNDF (2006), explains that regions with higher urbanization levels have higher GDPs per worker, a greater share of private formal sector jobs, and a higher share of manufacturing as well as better food security status. It notes that the contribution of urban and peri-urban agriculture to food availability and healthy nutrition for the urban population is one of its most important assets, aside from the support to household incomes and livelihoods of the people (World Bank, 2013).

2.2. Land Use and Policies on UPA Globally

The land use pattern has changed quickly as customary lands have been given out to the real-estate market in the form of gated communities, religious and college complexes, and individual residential properties often built without approval (Allen et al. 2015). Michael, Ulrich and Petermann (1998) claim that, most governments in Africa completely failed to establish functioning land tenure systems for all citizens (men and women, agriculturists and pastoralists, old and young generation), as there exists a delink between customary and statutory land laws regarding sustainable land use. In this regard, policies on land use and planning are important due to the increasing scarcity and complex competing land uses and demand. Aside the scarcity and competing uses of land, land degradation and conflicts between different user groups in the agricultural sector have resulted in a situation where increasing food demand is not met since lands used for farming have being taken out of production. This development results from such unplanned changes in land use patterns due to industrialization and faster urbanization (Michael, Ulrich and Petermann, 1998).

The issue of food security and land use in urban / peri urban areas is of such critical importance that it requires policy to address. This is important as it affects the status of UPA in cities in relation to the availability, access and use of land. Considering the importance of UPA, it is expected that land policies especially in the cities will deal with agricultural land usage as well as land for recreational, industrial and commercial use. Policy and regulatory frameworks regarding planning, zoning, allocation and use of land for UPA need to be established and implemented. However, as Michael et al. (1998) points out, the existing policies have not dealt with the city planning-agriculture-UPA nexus. The Food and Agriculture Organization (FAO) in 2005 revealed that, most African countries had no elaborate and encompassing policies on UPA. Due to this challenge, the FAO supported many African governments to develop and mainstream policies supporting UPA by organizing national workshops, baseline studies, project formulations and commissioned papers on UPAs in Botswana, Tanzania, Congo, Côte d'Ivoire, Guinea and Namibia, among countries (FAO, 2007).

Following these initiatives, in Tanzania, UPA has received attention and support at various policy levels. Due to this, agriculture which forms at least 60% of the informal sector is the second largest urban employer representing 20% of those employed (Mlozi, 1997: 5). In view of this, in the Strategic Urban Development Plan (SUDP), special land-use zones have been designated for agriculture (Kalokola 2010: 17). This policy functions as an important strategy for ensuring food security in the cities and towns in Tanzania. Again, zoning lands for UPA activities may contribute to local economic development, poverty alleviation and social inclusion of the urban poor.

According to Byerley (1996), the Botswana Ministry of Agriculture (MoA), has put together a multi-sectorial policy to push for the development and inclusion of UPA in National Development Planning. In view of this, the MoA has implemented certain projects which are geared at meeting the food and nutrition objectives of the country. These include having demonstration gardens in offices as a way of encouraging communities to develop backyard gardening, producing booklets for vegetable production to guide individual families and communities on how to produce vegetables, provision of formal and informal training in agricultural training centres, provision of technical assistance on production and marketing aspects of home and community gardens to individuals, families and communities (Byerley, 1996: 5). The policy of having demonstration gardens in offices may positively impact upon the greening and cleaning of the city by turning open spaces into green zones. Again, the provision of training, and booklets for vegetable production to UPA farmers could improve the knowledge and skills of UPA practitioners.

Furthermore, according to FAO (2001), Governador Valadares in Brazil has formulated a City Ordinance that regulates the temporal use of vacant municipal land by organised groups of urban producers. The vacant land (that might be land that is earmarked for other uses but not yet in use or land that is not fit for construction e.g. flood zones, land under power lines, etcetera, or buffer zones and land reserves for future use) is given out on short or medium term lease to organized groups of urban poor for gardening purposes (FAO, 2001:286).

In Asia countries such as Thailand, Indonesia, Cambodia and Laos, reforms on land use planning and tenancy continues with some incentives for long-term sustainable land use management. This encourages private ownership of registered lands for development, customary land rights improvements and decentralization as well as local cooperation with urban agricultural land users ((Michael, Ulrich and Petermann, 1998). This type of policy

reforms allows for a better land use system where sectorial needs (real estates, health, agriculture etc) are zoned for use.

Larbi et al. (2005) claim that in Ghana, there is no specific policy on UPA though there exist great opportunities for farmers and stakeholders in the sector. For Allen et al. (2015), land planning and zoning related to UPA have not been well captured especially at the national policy level. They argued that, agricultural lands available for farmers in Accra for example, exist under different circumstances (open, unused, water logged etc). In analysing the availability and use of these spaces, the study by Allen et al. (2015) reveal the variety of planning and land issues, which increase the potential for urban agriculture to contribute towards an environmentally sustainable and just urbanization process. However, Kasanga et al. (1996), Gough and Yankson (2000), Owusu (2008) claim that, the lack of updated urban and spatial planning in Ghana, as well as poor coordination between planning departments together with weak enforcement have resulted in weakened the land-use planning initiatives, allowing the real estate sector to dominate other land use activities such as urban agriculture.

IWMI (2014) indicates that in some places in Ghana where there are open spaces owned by state institutions and which can be used for UPA activities, these agencies are often reluctant to recognize farmers working on such lands with the fear that such activity could change the land use pattern of the area. On the other hand, Larbi et al. (2005) and IWMI (2014) claim that, most of the government institutions allow farmers to farm on the unused spaces on their lands to safeguard it from encroachment. This argument underscores the need to encourage these institutions and stakeholders to integrate UPA in their land use planning or encourage informal arrangements between these institutions and urban vegetable growers to regulate and ensure a planned land use pattern.

To advance the activities of UPA, scale up its potentials in Accra and later throughout the country, and resolve the challenges due to land access by farmers, a working group called the 'Accra Working Group on Urban and Peri-urban Agriculture' (AWGUPA) comprising some key government institutions, research organizations and civil society groups was established in 2005 according to Allen et al. (2015). Though funding challenges affected the operations of the group in their attempts to advocate for urban land use reforms, the urban land use challenges confronting the state provide opportunities for dealing with the issues in a manner that comprehensively meets the needs of all land users including land policies related to a sustainable UPA.

2.3. UPA Policies, Laws/By-Laws, and Regulations Issues in Ghana

One key objective of this study is to review critical and relevant policies, laws and by-laws guiding land use and access in urban and peri-urban areas and the adequacy of these regulations and by-laws in guiding and protecting UPA activities in cities and towns in Ghana. In this regard, this research tried to highlight smallholder agriculture developments in most major policy documents such as the FASDEP II, National Land Policy of 1999 and the Medium-Term Agriculture Sector Investment Plan (METASIP) from the key institutions like the Ministry of Food and Agriculture (MoFA), Land Use and Spatial Planning Authority (LSPA), Metropolitan, Municipal/District assemblies and others.

Against the above background. it is worthy to note that Larbi et al (2005) and other researchers such as Allen et al. (2015) and Michael et al. (1998) claim there is less of UPA policy issues captured in major policy documents of the country. Below is an overview of the

mandate of several institutions in land and agriculture and a review of policies pertaining to UPA.

Ministry of Food and Agriculture

The Ministry of Food and Agriculture (MOFA) is the lead institution responsible for the development and growth of agriculture in Ghana. Its primary roles are the formulation of appropriate agriculture policies, planning and coordination, monitoring, and evaluation of agriculture activities within the context of national economic development.

Land Use and Spatial Planning Authority (LSPA)

The Land Use and Spatial Planning Authority is the new name of the Town and Country Planning Division which derives its mandate from the Land Use and Spatial Planning Act (Act 925, 2016) and the Town and the Country Planning Ordinance (Cap 84, 1945). Its key functions are: preparation and provision of technical and human settlement planning as may be required by the National Development Planning Authority and performing spatial land use and human settlements planning.

Municipals/Metropolitan/District Assemblies

The Metropolitan, Municipal and District assemblies are the political administrative units at the decentralized level and are backed by the Local Government Act (Act 462, 1993) to regulate any form of activity within their jurisdictions including UPA activities. These assemblies have the general responsibility of policy making for agricultural, industrial and the general social and economic development of the local areas.

2.3.1. Food and Agriculture Sector Development Policy (FASDEP) I & II

The central role of agriculture in generating income, providing livelihoods for the majority of Ghanaians and catalysing economic transformation is acknowledged in the Food and Agriculture Sector Development Policy (FASDEP). FASDEP I was developed in 2002 as a policy framework to modernize the agriculture sector (MoFA,2007). Modernizing the agriculture sector was meant to provide good infrastructure, technology, access to credit and market access to farmers (MoFA, 2007:1). FASDEP I could not achieve the desired impact because the expectations of modernizing poor smallholder farmers suffered due to the fact that problem analysis of smallholder farmers was weak and did not sufficiently reflect farmers' perspectives on their needs and priorities. In addition, some of the smallholder farmers did not have adequate access to technology, infrastructure, credit and market. (ibid). Due to these limitations in the policy, MoFA in 2007, again came up with FASDEP II which sought to enhance the environment for agriculture and also provide further support to UPA. FASDEP II captured the long-term policy objectives of government in relation to the development of the agriculture sector. It aimed at ensuring that the sector's stakeholders were best positioned to take advantage of the emerging opportunities (ibid)

The FASDEP II policy on UPA stipulated the following: "Promote the development of community land use plans and enforce their use, particularly in the urban and peri-urban areas (FASDEP II: 2011-2015). This position sought to promote the integration of UPA in urban land use planning and zoning. In addition, the policy also acknowledged that, practitioners of

urban agriculture are confronted with problems of access to land, water, and extension services, particularly on the safe use of agrochemicals.

Again, previous studies on UPA (MoFA, 2007, and Armar-Klemas, 200) have found the need for more focused attention to address poor agricultural land and environmental management issues. In connection to this, FASDEP II encouraged "Improved access of operators in urban agriculture to sustainable land and environmental management practices, supported and facilitated adaptation and widespread adoption of farming and land use practices in harmony with natural resource resilience, and also underpinned the need for viable and sustainable production levels"(FASDEP II: 2011-2015). This means that access to adequate provision of land and good environmental practices are critical to the successful integration of UPA within urban and peri-urban areas. The policy thus encouraged practitioners of UPA to engage in good environmental management practices.

While the potential benefits and risks of UPA activities are clearly perceived and known, it is surprising to note that, in most cases, the captured policies, laws and by-laws by the mandated institutions to regulate UPA are not known by UPA practitioners and by the public. For instance, a regional level policy review and capacity need assessment survey conducted by FAO in 2014 revealed that less than 29.4% of UPA practitioners at the regional levels in Ghana are aware of the FASDEP II.

FASDEP II also encouraged institutional collaboration to enhance the activities of UPA. In relation to this, the policy thrusts are: "strengthen the intra-sectorial and inter-ministerial coordination through a platform for joint planning" (MoFA 2007:33). The guiding principle of this section of the policy sought to encourage collaboration of the stakeholders in UPA through the Ministry of Food and Agriculture (MoFA). This issue is very important because institutional gaps or inadequate institutional collaborations can exacerbate problems and neglect opportunities from UPA.

The review of both FASDEP I & II revealed that the framework for institutional collaboration within MoFA and across MDAs as promoted by the said policy frameworks have not been adequately and effectively managed. There is a little collaboration between MoFA, LSPA, Non-Governmental Organizations, and traditional authorities. Lands have not been zoned for UPA activities, and above all, UPA activities have not been adequately modernized as required by FASDEP I.

2.3.2. The Medium-Term Agriculture Sector Investment Plan (METASIP)

The METASIP was developed for the period 2011-2015 to implement development policies outlined in the FASDEP II. The objectives of METASIP, in line with the objectives of FASDEP II are as follows: Securing food security and emergency preparedness; improve growth in incomes; increase competitiveness and enhanced integration into domestic and international markets; sustain management of land and environment; science and technology applied in food and agriculture development and improve institutional coordination, (FASDEP II 2007, P: 23).

The METASIP was a medium term investment plan that sought to ensure that the country was a food secured nation by 2015 (Boateng et al 2014:1). Food security has been defined by Bigman 1982) as the ability of food deficit countries to meet target consumption levels on a year to year basis. Similarly, the World Bank (1986) defined food Security as the "access by all people at all times to enough food for an active, healthy life". In order to ensure "access

by all people at all times to enough food" most especially in the urban and peri-urban areas, component 2.6 of METASIP which supported UPA becomes relevant. METASIP (2011-2015: Pg.42) asserts that UPA makes a significant contribution to a variety of foods in urban markets, and creates employment, livelihoods leading to poverty alleviation. In order to enhance food security and growth in incomes through UPA, METASIP recommended the following:

> "Metropolitan, municipal and district authorities to zone areas within urban and peri-urban areas for agricultural activities. Identify owners and potential users of such lands for agricultural purposes and discuss and agree on conditions of use".

Among other things, METASIP (2010, pg 42) advocated urban land use planning and zoning through collaboration between stakeholders in UPA and MMDAs. Furthermore, it encouraged landowners to give vacant lands to UPA practitioners on longer term leases for UPA activities. Other recommendations by METASIP were that that peri-urban producers should be trained in Good Agricultural Practices (GAPs), Tuberculosis and Brucellosis screening tests should be conducted in the peri-urban milk collection areas as well as perform mass vaccinations, and that endo and ecto-parasitic control interventions be undertaken against these endemic diseases in peri-urban areas.

These recommendations from the METASIP are important and can form part of any revised UPA policy that may be developed. The recommendations deal with training and provision of technical advice/ extension services to UPA practitioners, with a strong focus on good farming practices, proper land management and marketing as well as promote health issues. In recognition of the importance of UPA, the METASIP between 2011 and 2015, made a provision of 0.9% of the agricultural sector investment budget to UPA activities. This was aimed at increasing UPA output by 20% over the period. It must be noted that there are gaps in the METASIP concerning UPA especially regarding the framework for ensuring stronger institutional collaboration between MMDAs, MoFA and other stakeholders in UPA which currently is largely ineffective.

2.3.3. Laws and by-laws guiding UPA

Although many benefits are derived from UPA activities, some UPA produce are often associated with health risks. These developments have led to the enactment of by-laws to guide UPA activities in Ghana.

2.3.4. Local Government Act (462), 1993.

The Local Government Act, 1993 (Act 462) provides the institutional and legal framework for the functions of Metropolitan Assemblies (MAs), giving them executive and deliberative powers to plan for the overall development of their metropolitan areas. The law recognizes MAs as the planning authority in their respective areas of jurisdiction (Appiah Williams, 2012: 18).

The Accra Metropolitan Assembly (AMA) bye-laws (Growing and Sale of Crops, 1995) restrict urban agriculture to land outside one's premises (open-space farming) and requires mandatory registration with the metropolitan officer of health with the intention to maintaining good sanitary conditions in the city" (METASIP 2010, pg. 37). Due to such health and environmental concerns, the by-law stipulates that no person shall grow crops anywhere

other than on land within his/her premises unless he/she has registered with the medical officer of health, furnishing his/her name and address and the description of the site where the crop is to be grown (AMA 1995, pg. 171-202). Though this by- law is laudable, the local government law (Act 462) is not felt at the level of metropolitan/ municipal/ district levels because of lack of implementation capacity in the MMDAs, and inadequate flow of funds to the MMDAs.

2.3.5. UPA and Sanitation and Health Issues

The use of waste water in urban agriculture is a centuries-old practice. Ackerson et al (2010) observed that, the environmental and health risks posed by wastewater irrigation are alarming especially when untreated and or/partially treated wastewater is used for UPA activities. In this regard, by-laws have been promulgated to guide Metropolitan and District Assemblies (MDAs) to prevent environmental and health risks associated with UPA activities. For instance, the AMA by-law (1995) stipulates that,

> "No parts of the crops consumed in the fresh or raw state shall be watered or irrigated directly from a drain or any surface water from a drain which is fed from any water from a street drainage, unless appropriate risk reduction measures such as drip irrigation, furrow irrigation and cessation of irrigation prior to harvesting as outlined in the WHO/FAO guidelines (wastewater reuse) of 2006, or simple water treatment options are put in place."
> (AMA 1995, pg. 171-202).

This by-law is aimed at minimising the public health risks associated with waste water irrigation even though waste water irrigation has been noted to create a convenient means of disposing waste products, adding valuable plant nutrients, and improving urban vegetable security and the livelihood of farmers and traders (Ackerson et al, 2010: 2). The Ghana Statistical Service (2000), revealed that most urban centres in Ghana have no means of treating wastewater and that the sewage network serves only 4.5% of the population. This implies that the bulk of the generated waste water enters the environment without treatment. This is likely to contaminate water bodies. On account of the fact that urban vegetable farmers do not have consistent source of safe water for irrigation, they often rely on waste water for year-round production (Ackerson et al, 2010). The use of waste water irrigation affects the quality of vegetables because of the presence of pathogenic micro-organism, such as bacteria, viruses, and protozoa. The pathogens are often transmitted by direct contact to farmers and also to the general public through consumption of irrigated produce (ibid). On the contrary, Klemesu and Maxwell (1998) in study on urban farming in Accra, revealed that vegetables irrigated with tap water have a lower bacterial count than those irrigated with wastewater which is a major source of contamination in the UPA marketing, handling and distribution system.

Similar findings are made in a recent study by researchers at Ardhi University, Tanzania (entitled "Characterisation and assessment of heavy metals by accumulation in water, soil, and vegetable grown in the Msimbazi river"). The study found some health risks posed by the consumption of urban agricultural products (in particular Spinach, Pumpkin leaves, Chinese cabbage Amaranths, which only requires 3 weeks to harvest), due to the reliance on polluted water sources for irrigation (Andrews, 2008). The use of polluted water sources for irrigation has resulted in high levels of heavy metals, such as lead, cadmium, copper and chromium that exceed World Health Organization standards (Kalokola, 2010). In the same

study, it was observed that there are a number of secondary health impacts due to the proximity of urban agriculture to high density residential development. These include the transmission of animal diseases from the removal of livestock waste (animal dung can be a source of tetanus), improper disposal of animal corpses, and chemical contamination from the overuse of antibiotics and pesticides. Malaria is also a concern, as vegetables and field crops can harbour mosquitoes that carry malaria.

2.3.6. The Town and Country Ordinance of 1945

The Town and Country Ordinance was developed in 1945 as a sequel to the 1925 ordinance (Appiah Williams, 2012: 33). The preamble of the Town and Country Ordinance of 1945 states that:

"An ordinance to make provision for the orderly and progressive development of land, towns and other areas, whether urban or rural., also, Section 4(1) of the Ordinance then provides a sanction that where an area has been so declared no person should carry out any development of land or any construction, demolition, alteration, extension or repair of any building until final scheme is approved under section 13 of the same ordinance". (Appiah Williams, 2012:23)

This implies that, the Town and Country Planning Department was responsible for developing lands in towns, cities and rural areas, preparation of planning schemes and setting of planning standards and regulations. In addition, subsection 3 of the Local Government Act (462, 1993), sections (46-78) also creates each District Assembly as a planning authority (Appiah Williams, 2012:26). In this context, assemblies are expected to design their own development plans and take actions and decisions necessary to bring about the overall development plan so far as it is not inconsistent with national development plan. These provisions put the Town and Country Planning Department under the decentralized departments under the MMDAs. In the performance of their planning functions, MMDAs have had to rely on the Town and Country Ordinance of 1945. In addition, while Act 462 recognizes MMDAs as planning authorities within their respective areas of jurisdiction, there is no subsidiary legislation regulating and coordinating the physical planning functions, standards and roles of the MMDAs and other state institutions, resulting in conflict and overlapping of the discharge of the responsibilities with the Town and Country Planning Department.

2.3.7. National Land Policy of 1999

The quest for a credible land management policy in Ghana led to the promulgation of the National Land Policy (NLP) in 1999. A section of the NLP (1999), under "sustainable land use" stipulates that:

"Land categories outside Ghana`s permanent forest and wildlife estates are available for such uses as, agriculture, timber, mining and other extractive industries and human settlement within the context of human land use plan"(NLP 1999:11).The policy further states that: "Uses of wetlands for farming, grazing, fishing and timber production and salt-winning will be encouraged, but declares a minimum of 100 meters (m) off the high water mark as protected area" (NLP, 1999:12)

The policy provides a framework and direction for dealing with human land use and settlement and the use of wetlands for UPA purposes. This policy supports sustainable productivity of wetlands, but declares a minimum of 100 meters (m) off the high-water mark as protected area. This prohibition is targeting on the one hand flood control, i.e. the sealing of natural drainage areas through constructions, and on the other hand aims at the protection of the water bodies from pollution.

2.3.8. The National Spatial Development Framework for Ghana (NSDF)

Another policy which touches on agriculture is the National Spatial Development Framework for Ghana (NSDF, 2015-2035) developed for use under the Town and Country Planning Agency which is now the Land and Spatial Planning Authority. The framework promotes the concept of "foodsheds" and section 4.13 of the NSDF proposes the development of "urban foodsheds". This framework supports the production, processing, and distribution of farm produce within certain distances in urban and peri-urban areas. The policy outlines the benefits of "urban foodshed" as:

> "Food grown nearby reduces transportation cost, energy and potential disruption of the supply process of the commodities. Locally produced food is more nutritious. The greater access to fresh produce, the less likely we are to suffer from diet related illness such as obesity and diabetes" (NSDF II, pg.129).

The framework acknowledges that goods produced in the cities are generally cheaper than those imported because low transport costs are incurred from the urban production areas to the urban consumption centres. The production of food within the urban areas ensures the freshness and quality of perishable foods because of easy access by urban consumers thus increasing overall variety and the nutritional value of food available. In effect, both the rich and the poor in urban and peri-urban areas can get access to quality food at a reduced cost.

2.3.9. The Ghana Poverty Reduction Strategy (GPRS II)

Agriculture modernization constitutes a major strategic policy objective that has been enshrined in the Ghana Poverty Reduction Strategy document (GPRS II). The GPRS II section on agriculture outlines some key strategies for ensuring access and sustainable management of agricultural land. Some of the key strategies are:

> "Sustainable land and environmental management practices will be mainstreamed for agriculture sector planning and implementation, development of community land-use plans and the enforcement of their use, particularly in urban and peri-urban agriculture" (GPRS II, pg.120).

Agriculture under the GPRS II seeks to achieve shared growth and poverty reduction through sustainable land use planning, enforcement of their use in urban and peri-urban areas. It provides a framework to ensure easier access and more efficient land ownership and title processes.

2.4. Summary of the Policy Reviews on UPA

Land policies have considerable bearing on UPA. Many of these laws acknowledge and provide legal backing for urban agriculture and mandates some state institutions to regulate UPA. However, due to lack of funding and implementation mechanisms, such legislations have been largely ineffective. For example, most of the UPA policies captured by MoFA are not executed strongly in the field. For Cisse et al. (2005), urban agriculture is marginalized in the statutory and legal codes of most African countries including Ghana. Even in cases where some provision exists for this activity, those provisions are inadequately implemented or contradictory due to duplication and overlapping of roles and mandates of the institutions charged with the responsibility for planning, use and management of lands (Arku et al, 2012).

CHAPTER THREE

METHODOLOGY

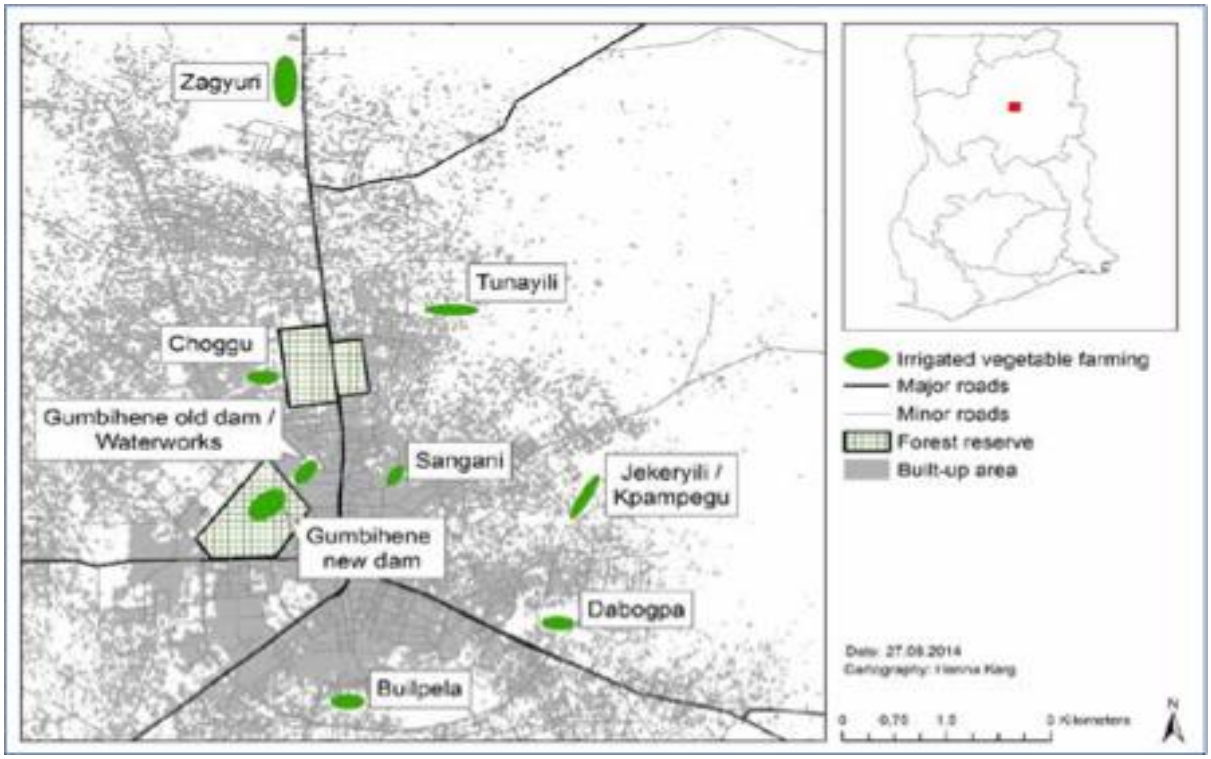
The study used a mixed methodology in the data collection process and the analysis in three cities namely, Accra, Tamale and Sunyani. Survey questionnaires were designed to reach individual farmers, focused group discussions to farmer groups and key informant discussions with relevant institutional stakeholders.

3.1. The Study Areas

3.1.1. Tamale Metropolitan

The Metropolis has a total estimated land size of about 647 km sq. with 115 communities and lies about 600 km north of the nation 's capital, Accra (GSS, 2010; 2014). The Metropolis is between latitude 9°16 and 9° 34 North and longitudes 0° 36 and 0° 57 West (GSS, 2014). The strategic and central position of Tamale serves as a catalyst that attracts people from the Southern part of the country and the people from landlocked countries. Agriculture is the mainstay of the people, with some provision of goods and services complementing the agricultural activities of the people in the Metropolis. After rapid growth in the late twentieth and early twenty-first century, population in the 2010 census estimated the population to be 371,000 (Ghana Statistical Service, 2010 Population and Housing Census). UPA activities are widespread in the city as seen in the areas shaded green in Fig 1 below.

Figure 1. The study area of Tamale with UPA

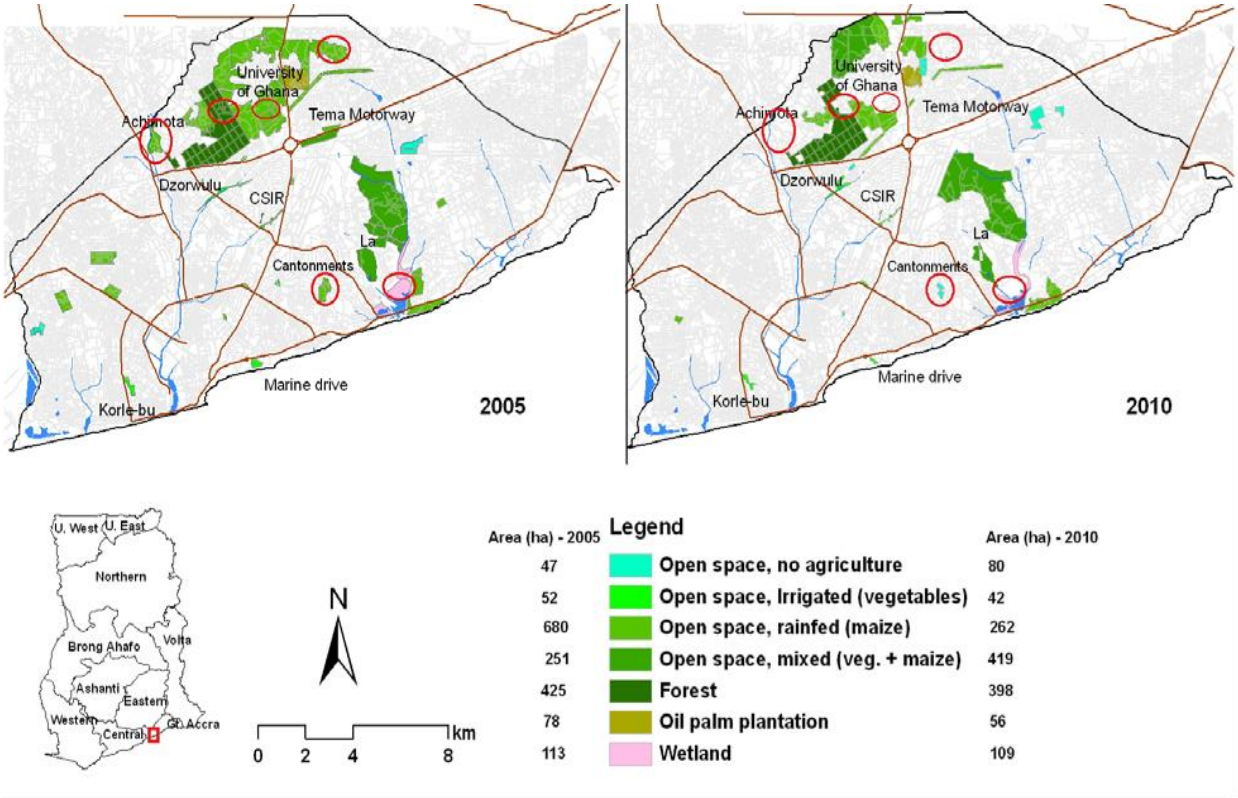


Source: IWMI

3.1.2. Accra Metropolitan

Accra is the seat and hub of the Government of Ghana. Accra borders the Volta, Eastern and Central regions of Ghana and it is a coastal city. According to the 2010 Population and Housing Census, the population of Accra Metropolitan Assembly (AMA) was estimated at 1,665,086, representing 42% of the region's total population. Males constituted 48.1% and females 51.9%. The major household agriculture activities in the metropolis are crop and livestock rearing, which represented 77.7% and 23.5% respectively of agricultural activities (GSS, 2010). It is a metropolitan area with vibrant agricultural activities, including UPA as illustrated in the green areas on the map shown below.

Figure 2: The study Area of Accra with UPA



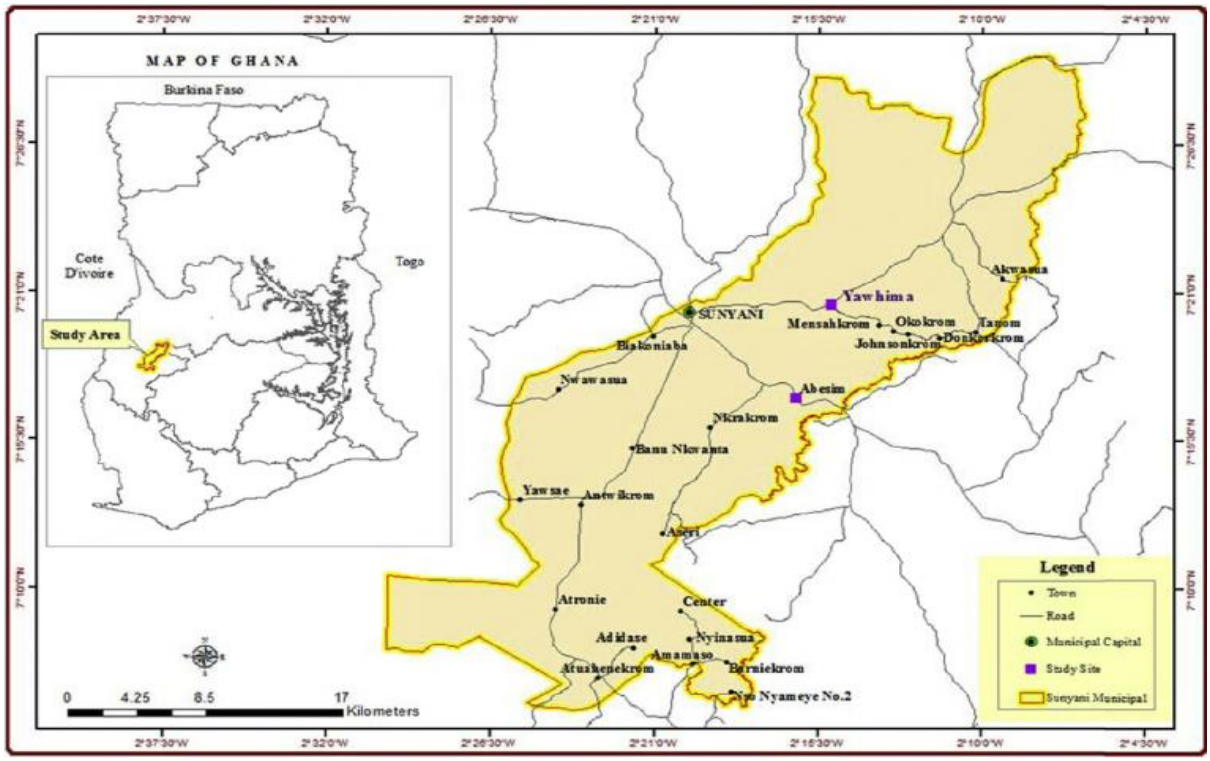
Source: IWMI

3.1.3. Sunyani Municipal

The Sunyani Municipal Assembly covers a total land area of 506.7 Km2. It is bordered on the North by Sunyani West District; on the West by Dormaa East District and on the South by Asutifi District and the East by Tano North District (Figure 1, GSS, 2010). The monthly temperatures vary between 23°C and 33°C with the lowest around August and the highest around March and April with an average rainfall is 88.99cm. The Sunyani Municipality has as high as 34.3 percent of people engaged in agriculture. In the rural localities, eight out of ten households, representing 72.2 % are agricultural households, while in the urban localities,

28.0% of households are into agriculture. (Ghana Statistical Service, 2010 Population and Housing Census) as captured in the yellow areas on the map shown below.

Figure 3: The study Area of Sunyani with UPA



Source: IWMI

3.2. Population and Sampling Size

A total sample size of 244 farmers were selected from 24 UPA communities. Simple random sampling method was then used to select individual respondents from each community for the survey which involved the administration of a well-structured and semi-structured questionnaire. This technique ensured that each farmer within the group of 244 farmers had the equal chance of being selected into the survey. A total of 14 community focus group discussions and 6 institutional key informant interactions as captured in Table 1 were also done. Also, purposive sampling method was also used to select the relevant stakeholders (farmer group leaders and other opinion leaders'/extension officers) for the interview.

3.3. Data Collection

For the surveys, 6 graduate assistants who served as enumerators were engaged and trained for the data collection process together with the researchers. To generate quality data, they were taken through the structure and nature of the questionnaire, approach to interacting with respondents, getting leads, filling the forms, time management, community entry and reporting the output of the surveys. A pre-testing to improve on the quality of the questionnaire to generate the needed data adequately was carried out as well as a reconnaissance survey to know the communities, establish contacts and arrange for scheduled meetings with key informants and individual interviewees. During this period, the researchers

familiarized themselves with the issues under study. Introductory letters explaining the purpose of the survey were also sent to the relevant organizations and farmer groups in Tamale, Accra and Sunyani to schedule an appropriate time for the interviews. These organizations included Ministry of Food and Agriculture (MoFA), Tema Development Corporation (TDC), Lands Commission and the Town and Country Planning Authority. Policy positions of these institutions including the Municipal and Metropolitan Assemblies on UPA, land use trend, rights, changing patterns were discussed and reviewed.

Table 1: Study Areas

Agro-Ecological Zones	Cities	Urban Cluster	Peri-Urban Cluster
Savannah Zone	• Tamale Metropolis	• Jekarayili • Gumbihini VRA • Gumbihini New Dam • Choggu Chefuriguni • Sangani • Nyanshegu • Builpiela	• Fuo • Kobilimahigu • Dabopaa • Datoyili • Nyohini • Gumani • Tunayili • Gurugu Baani • Zagyuri • Fushegu • Tugu Yapala
Transitional Zone			
	• Sunyani Metropolis	• Abesim • Yawhia • Kontonkrom • Nwowasu	• Odumase • Nsoatre • Chiraa
Forest Zone			
	• Accra Metropolis	• Dzorwulo • GBC • Marine Drive • Korlebu • CSIR • Air port	• Shaiman • Adjei-Kojo • Tema Fishing Harbour • Motorway • Amasaman • Pokuasi • Oyibi

3.4. Data Analysis

The data was qualitatively and quantitatively analyzed. The quantitative data was analyzed using SPSS and the qualitative data by using NViVO. The coded questionnaire was punched into SPSS and analyzed based on the research objectives. The qualitative data which embodied focus group discussion, key informant discussion as well as policy review were coded, clustered into themes, categories, sub categories for concept and trend analysis.

3.4.1. Analytical Methods

The study used the following analytical method to analyze the specific objectives of the study.

Table 2: Analytical Framework

Objectives	Analytical method
To identify major UPA activities in the key cities / big towns in Ghana that serve as livelihood source for urban / peri-urban dwellers.	Basic descriptive statistics, means, frequency, percentages
To establish major areas of production and marketing of UPA livelihood activities	Basic descriptive statistics, (means, frequency, percentages) into charts and tables
To assess the profitability of the key UPA livelihood activities identified in the designated cities and towns with particular attention to cost of inputs such as land and its tenure security	Basic and descriptive statistics, Using profitability and Gross Margin analysis
Review policies, laws and by-laws guiding land use and access in urban and peri-urban areas and the adequacy of regulations and by-laws in guiding and protecting UPA activities.	Document review of existing policies, use of key informant interviews for content analysis
To describe the changing land use patterns in each of the designated major cities and towns and its estimated effect on the profitability and sustainability of UPA in the country.	• Basic descriptive statistics, (means, frequency, percentages) into charts and tables • Use of focus group discussions for trend analysis

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

This section discusses the findings of the research in relation to the stipulated objectives focusing on the demographic characteristics of the responders, the UPA policy and regulatory issues, the production, marketing of the produced commodities and the profitability of the agricultural enterprises relative to the changing trends of land use in the study areas.

4.1. Personal Characteristics of respondents

Age Distribution

One of the issues determined by the study is the age distribution of the respondents. The study found out that the oldest UPA farmer was 83 years old and the youngest, 17 years. The mean age of the respondents was 42 years. Table 4 below shows the age distribution of the sample studied.

Gender and Marital Status

The analysis of the survey data in the three cities indicates that 82.4% males and 17.6% females are engaged in UPA activities in the study areas. Table 4 below shows the sex distribution of respondents. The study observed that 79.5 % of the responds were married, 14.5% single, 2.5% divorced, and 3.3% widow/widower, showing that those who have some family responsibilities were more likely to be involved in UPA activities amongst the respondents. The result of few women engaging in UPA activities from the current study is contrary to some previous studies in Kampala and Harare (Maxwee and Zziwa, 1992; Mbiba, 1995) which concluded that, in most urban areas of Africa, women are increasingly resorting to UPA to help meet the deficits in their families' food needs. Ebouebe and Hope (2014) however affirmed that men dominate vegetable farming in urban spaces in Ghana.

Level of Education

The study examined the level of education of respondents engaged in UPA activities in the study areas and found that 38.5% of the respondents have no formal education, 30.3% have JHS/middle school, Secondary/SHS 10.2%, Primary, 9.8%, Tertiary.5.3% Islamic/Arabic education 4%, Non-formal education 3.7%, and others 8% (see Table 4).

Household Dependants

To determine the level of dependency of the UPA practitioners in the study areas, the respondents were asked to give the number of dependents in their households. The result of the survey showed that 76.6% of the household dependents were less than 6 years, 13.1% of the respondents had dependants between the age range of 6-17 years, 6.6%, of the respondents had dependants between 8-35 years whiles 2.5% of the respondents had dependants in the 36-50-year range and only 4% of respondents had dependents above 50 years (see Table 3 below). From the results, 76.6% of the dependents were less than 6 years and therefore young.

Table 3: Personal Characteristics of Respondents

Sex	**Frequency**	**Percent**
Male	201	82.4
Female	43	17.6
Total	244	100
Level of Education	**Frequency**	**Percent**
No formal education	103	42.2
Primary	24	9.8
JHS/middle	74	30.3
Secondary/SHS	25	10.2
Islamic/Arabic	3	1.2
Tertiary	13	5.3
Others	2	0.8
Total	244	100
Marital Status	**Frequency**	**Percent**
Married	194	79.5
Single	36	14.8
Divorced	6	2.5
Widow/widower	8	3.3
Total	244	100
Household dependents	**Frequency**	**Percent**
Less than 6years	187	76.6
6-17 years	32	13.1
8-35 years	16	6.6
36-50 years	6	2.5
Above 50 years	2	0.8
Total	244	100
Category	**Frequency**	**Percent**
Crop Farmer	238	97.5
Livestock farmer	3	1.2
Marketer	2	0.8
Total	244	100

Source: Field Survey, 2017

4.2. Major Occupational and Livelihood Activities of the Respondents

Data analysis revealed that 92% of the respondents were engaged fully in farming, 2% were salary earning respondents who were into farming as part time and lastly those engaged in petty trading constituted 3 % of the 244 respondents. The majority of the respondents interviewed during the study were therefore farmers. Table 4 shows that the percentage occupational participation in UPA as indicated above.

The study also surveyed the types of farming practiced in UPA in the study areas. The results showed that 97.5 % of the respondents were engaged in crop farming, 1.2 % in livestock rearing whiles 8% were into general petty trading of UPA products. The crops cultivated to support their livelihoods were mainly cabbage, lettuce, onions, maize, tomatoes, okra, pepper and others. Danso et al. (2002) confirmed that, these crops are widely cultivated by urban farmers in Kumasi, Accra and Takoradi under both rain-fed and irrigation farming systems.

Two women traders who were part of the survey revealed that without the farmers, their livelihoods will be affected and that trade in agricultural commodities was introduced to them while they were growing up as young adults. They revealed that in addition to just buying from the farmers, they added value by packaging the produce for sales to the stores/super markets, restaurants and hotels.

Table 4: Occupation/Livelihood Sources of Respondents

Occupation	Percent	Frequency
Farming	92.6	226
Salary employed	2	5
Petty Trading	3.3	8
Others (livestock)	2	5
Total	100	244

Source: Field Survey, 2017

Another two respondents who are livestock farmers, said animal rearing was what they know best and that, it was challenging to compare with crop farming because of the high expenditures involved in rearing livestock in confinement.

> *'We feed and fatten our cattle targeting rich people and other livestock buyers like the butchers, which is profitable' FGD*

4.3. The Changing Land Use Patterns in Tamale, Accra and Sunyani and its Estimated Effect on the Profitability and Sustainability of UPA in the Country

Fuller & Gaston (2009) explained that changes in land use patterns are outcomes of anthropogenic activities of man in space and time. These changes in cities and communities differ by levels due to differences in their growth patterns and intensity of economic activities. Accra, Tamale and Sunyani experience different forms and levels of changing land use patterns. Respondents intimated that 70% of farm lands they were farming on within the urban catchment in Accra, Tamale and Sunyani have all been taken up their land owners and used for residential buildings and other activities. During focus group discussions with the farmers, they recounted that the loss of their farm lands has been due to property development for

homes, offices and industries. This development is driven by population growth and other economic uses of land. They further revealed that;

"Farming vegetables in Tamale have not been easy and is characterised by water problems, pressures from land owners who take over their lands with the result that land sizes are decreasing all the time. We all now have very small parcels of lands for the vegetables we produce. Our members in Chefurigini, Katariga, Zagyuri, Gumbihini and the Koblimahigu areas are the suppliers of vegetables to the people of the Tamale Metropolis. Why can't we have a permanent place given to us to farm in these suburbs? In addition to that where we are pushed to farming are areas which are not fertile" **FGDs Gumbihini, Tamale**

"*We don't farm to our capacity because there are not enough lands*" (FGDs **Nyansagu, Tamale**)

"We used to farm around Opebia area, Roman Ridge, Nyaho Clinic areas and most parts of Dzorwulu. *Most parts of those places now have high rise buildings as offices and apartments. We have been moving as development pushes us away. We used to rear animals and produce many crops. Now, only produce very few vegetables"* (**FGD, Dzorwulu, Accra)**

*"There are fewer lands for cultivation as real estate developers and private individuals now buy the land we have been cultivating and are building residential and commercial properties. Lands we were using for agriculture is now being competed for by non-agricultural users. Urban and peri-urban agriculture is shrinking because of this. Our food supply is impeded as land put under cultivation is reduced" (**FGDs, Abesim, Sunyani**).*

"*Now the farming lands have all been converted to communities*"
(**FGDs Chira, Sunyani**)

The above statements made during FGDs indicate that lands for UPA activities have been converted for non-agricultural purposes by estate developers and private individuals. The same development trend happened in Lurigancho Chosica in Peru between 2002 and 2006. During this period, the city lost 305 hectares of agricultural land due to changes in land use, to quarrying and brick-making for the construction industry of the city (World Bank, 2014). An additional factor contributing to the changes in land use pattern is the lack of tenure security of land. The effect is that such changes imped food supply in urban and peri-urban areas, as most lands have been converted for non-agricultural activities. Land tenure security issues are considered challenging for UPA and therefore land use in such areas are often characterized as informal (De Zeeuw, 2000) because those who use the lands do not have titles or leases to claim ownership. To sustain the activities of UPA in Ghana, it is observed that lands should be zoned at the metropolitan, municipal and district levels with clear rules concerning access, farming methods and systems to be used. In this context, experiences from countries that are successful with UPA could be adopted. In Freetown, in Sierra Leone for instance, all wetlands and low-lying valleys are zoned for UPA and this helps to increase water infiltration, reduce flooding, keep the flood-zones free from illegal construction and promote the production of food as well as increase job creation. In Senegal, as a result of government funding to the UPA sector (World Bank, 2014), about 3,000 family vegetable farms were created which resulted in over 14,000 jobs created cumulatively.

From the study in the three cities, it came out that three classes of crops namely, cereals, legumes and vegetables were the main commodities produced in the past. Currently, only

vegetables are largely produced due to challenges related to difficulty in accessing lands resulting from the rapid urbanization currently on-going. It was only in Sunyani that plantain was produced alongside vegetables. This situation in Sunyani can be attributed to the fact that that the farmers are not under extreme pressures to give up their farm lands compared to Accra and Tamale. In the latter case, pressure on land is due to increasing population density of 35.2 people per square kilometre. GSS (2014) revealed that 28% of the urban households in Sunyani Municipality are engaged in agriculture whilst 26.1% in the Tamale Metropolitan and only 3.2% in the Accra Metropolis. The high percentage of 28% in Sunyani and 26.1% in Tamale engaged in urban household agriculture are an indication of how entrenched UPA activities are to their livelihoods in both Sunyani and Tamale. Data from the Ghana Statistical Services revealed that all three major cities have showed a significant increase of the population since 2010. These increases in population will require accompanying essential social and infrastructural amenities to offer social welfare and to spur economic growth. Hence, the intense competition for alternative uses of land other than agriculture.

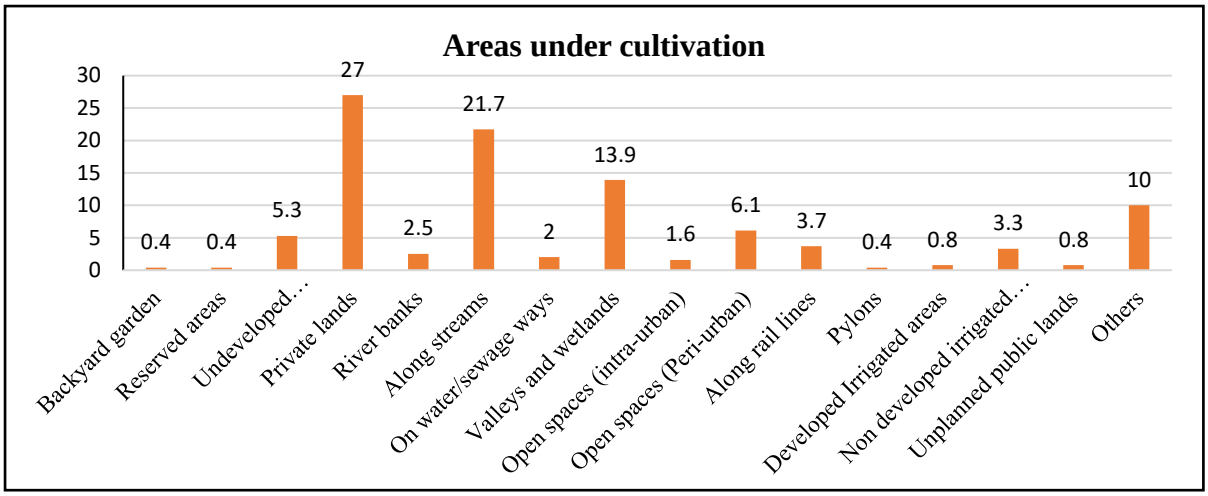
Table 6: Population of the Three Cities between 2010 and 2014

City	2010 Census	Population estimates 2014
Accra Metropolitan	1,848,614	2, 270,000
Tamale Metropolitan	233,252	371,351
Sunyani Municipality	123,224	248,496

Source: GSS, 2014

Regarding how conducive the areas are for UPA activities, the farmers revealed that they farm along water streams (21.7%), on peoples' private lands when the lands not been used (27%), valleys and wetlands (13.9%), unused government lands (5.3%) and open spaces (6.1%) as seen in Figure 4 below.

Figure 4: Land spaces where UPA production is done



Source: Survey Field Data, 2017

From the foregoing, two key factors are influential in the choice of areas for vegetable farming in the cities. These are access to water for irrigation and to land. As has been explained earlier, the lands the farmers crop on are in the outlying areas which are normally infertile. These areas are normally government lands which often are unused spaces/reserved areas which have sources of water such as streams. UPA is also done in areas under electricity pylons (Figure 4). Other areas are valleys and irrigated sites developed by Ghana Irrigation Development Authority (GIDA). The practice of UPA in all these areas normally require the use of lots of soil enhancing inputs because they are largely infertile. Farmers claim that most of these spaces they cultivate are free of litigation issues which provides them with the safe conditions for their farming activities.

It must be noted that ideally, these irrigated areas used for UPA activities should have been reserved, zoned and maintained to keep the city's green vegetation and general healthy ambience. These agricultural lands should have been designated UPA areas in the cities.

In an interaction during a focused group discussion, a participant indicated that;

> *"I use my backyard for cultivation, and cultivating on my back-yard helps a lot. It helps in environmental cleanliness, protects against reptiles' attacks, and promotes access to fresh foodstuff"* ***(FGDs, Fuo, Tamale).***

The above statement shows that farmers doing UPA yearn for safe areas where they can earn incomes and safeguard themselves against reptiles and other environmental hazards. Against the background that city authorities and other government agencies are not proactive in officially designating urban agricultural lands for UPAs, farmers are taking advantage of available spaces in the urban areas to make substantial incomes from UPA activities.

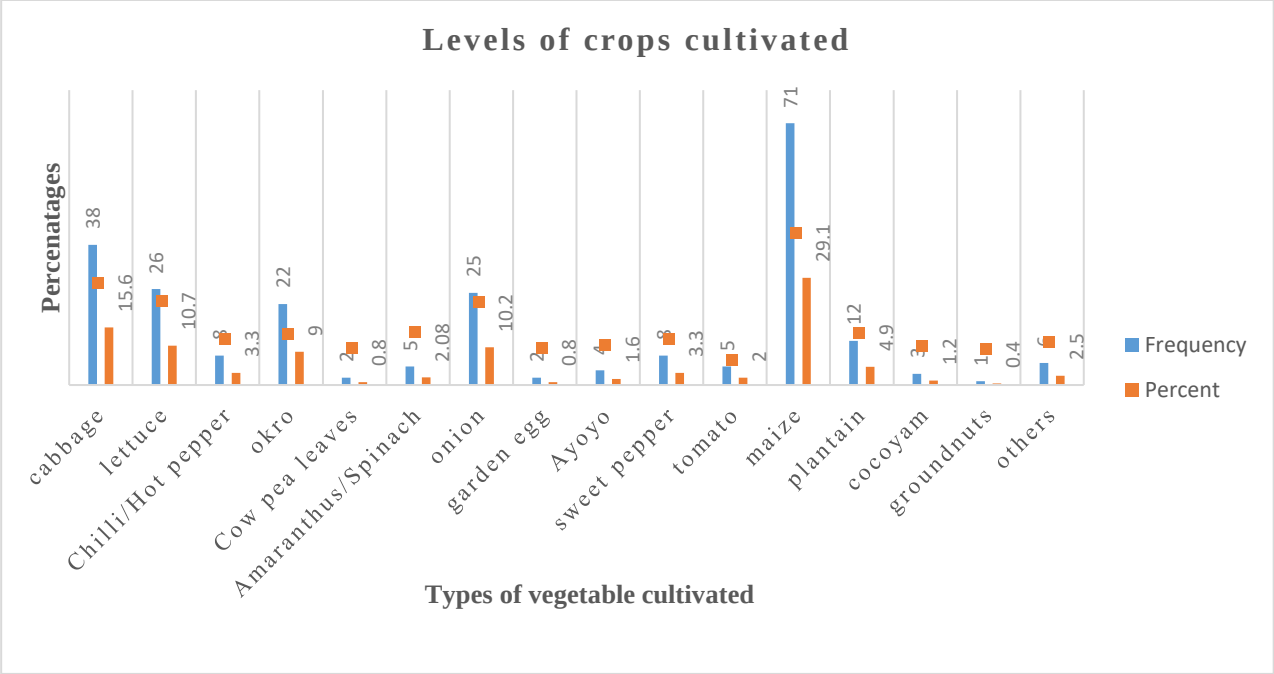
With an average seasonal income of GHC 2,081.40, GHC 1,460.90, GHC 826.80 and GHC 2,657.20 for onions, cabbage, lettuce and sweet pepper respectively per hectare (Table7) cultivated respectively per farmer, per hectare, UPA can be rewarding in all the cities studied. Table 7 below shows the various levels of incomes earned by UPA farmers in the cities of Accra, Sunyani and Tamale per hectare of land.

Farmers in Accra obtained better incomes except for maize, which are attributed to the higher price of the commodities in Accra compared to Tamale and Sunyani. This is because the purchasing power of the inhabitants in Accra is generally higher than those of the other cities increasing the effective demand for these commodities and consequently raising prices which inure to the benefit of the farmers in Accra. Per these findings, it could be assumed that all things being equal, if more land is allocated for UPA in these cities, farmers' incomes will increase, cost of vegetables will reduce because of higher levels of production and the produce will become more accessible and available to consumers thereby reducing household food expenditures.

4.4. Assessing the Profitability of key UPA Livelihood Activities Identified in Accra, Tamale and Sunyani.

For the 3 cities surveyed, 29% of the 240 respondents cultivated maize, 16% cabbage, 11% lettuce and onions each, 9% onions, 3.3% sweet pepper, 2.2% tomatoes, and 18.5% other agricultural food products. These vegetables and maize are the common commodities demanded in the cities. The findings of Armar-Klemesu and Maxwell (2000) and Allen et al. (2015) affirm these results- that these vegetables are the most widely grown in urban settlements. These produce widely serve and contribute to food security and nutrition in the urban and peri urban areas. As a result of continuous cultivation of these crops over the years, the farmers have gained a lot of knowledge in terms of the applying required good agronomic practices. The farmers revealed they do that they purposely cultivate these crops to earn income (74%), food (19%) and for both income and food (7%). These findings are confirmed by Danso et al. (2007) who revealed that, all urban and peri-urban agricultural cultivation in Ghana are for mainly income purposes and followed by food for domestic consumption.

Figure 5: Crops grown by farmers in Accra, Tamale and Sunyani under UPA



Source: Field survey, 2017

Table 7: Average Cost (GH₵), Revenue (GH₵) and Gross Margin (GH₵) per Hectare of UPA Crops in the Study Area

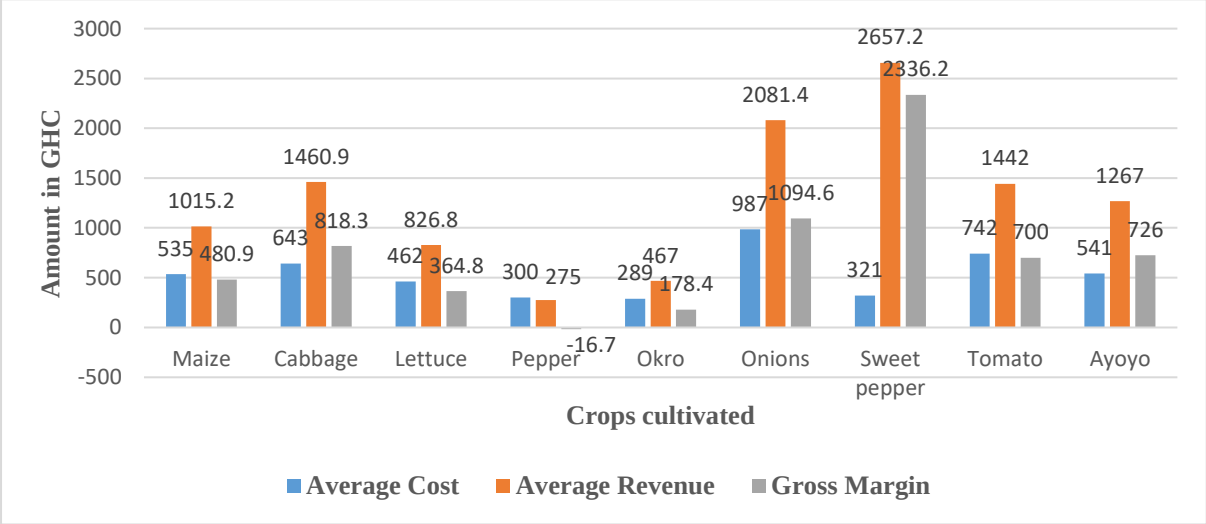
Crops	Tamale			Accra			Sunyani			Pooled		
	Average Cost	Average Revenue	Gross Margin	Average Cost	Average Revenue	Gross Margin	Average Cost	Average Revenue	Gross Margin	Average Cost	Average Revenue	Gross Margin
Maize	452	1337.2	885.2	632	993.6	362.6	520	714.8	195	535	1015.2	480.9
Cabbage	633	1752	1119	653	1050.8	397.8	642	1580	938	643	1460.9	818.3
Lettuce	413	819.2	406.2	511	834.4	323.4		n/a		462	826.8	364.8
Pepper	297	224	-73	n/a	n/a	n/a	303	326	23	300	275	-16.7
Okro	270	252.4	-18	307	853.2	546.2	289	295.6	7	289	467.0	178.4
Onions	n/a	n/a		989	3869.2	2880.2	985	293.6	-691	987	2081.4	1094.6
Sweet pepper		n/a		321	2657.2	2336.2		n/a		321	2657.2	2336.2
Tomato	723	2316	1593		n/a		761	568	-193	742	1442	700
Ayoyo	515	798	283	567	1736	1169		n/a		541	1267	726
	472	**1071**	**599**	**568.6**	**1713.5**	**1145.0**	**583**	**630**	**47**	**536**	**1276.9**	**742.5**

Source: Field Survey Data, 2017

The seasonal production cycle differed from community to community due to differences in the availability of water resources for irrigation of their crops. Whilst many farmers produce all year round using irrigation, those who depend on the rain-fed system only produce once. The study found that most UPA farmers were using basic farm tools (hoe, cutlass, watering cans, knapsack sprayers) for their farming operations, implying that the production process was not mechanised. The manual form of production in the study areas contributed to the low seasonal cost of production if costs fertiliser and chemicals are not factored in the production of these selected crops. Table 7 below shows the average cost of producing any of these crops within the local UPA system for the three cities studied.

Table 7 shows the costs of production in the studies areas. It was observed that tomato, onions and cabbage had the highest cost drivers (Figure 6) due to the high levels of agro chemical required to control pests and diseases. At the city level, production cost was low for Tamale compared to Sunyani and Accra (Table 7). The variable cost factors were rented labour, land rent and ploughing whiles cost of inputs was almost the same across all 3 cities.

Figure 6: Average seasonal cost of production by cities/farmer



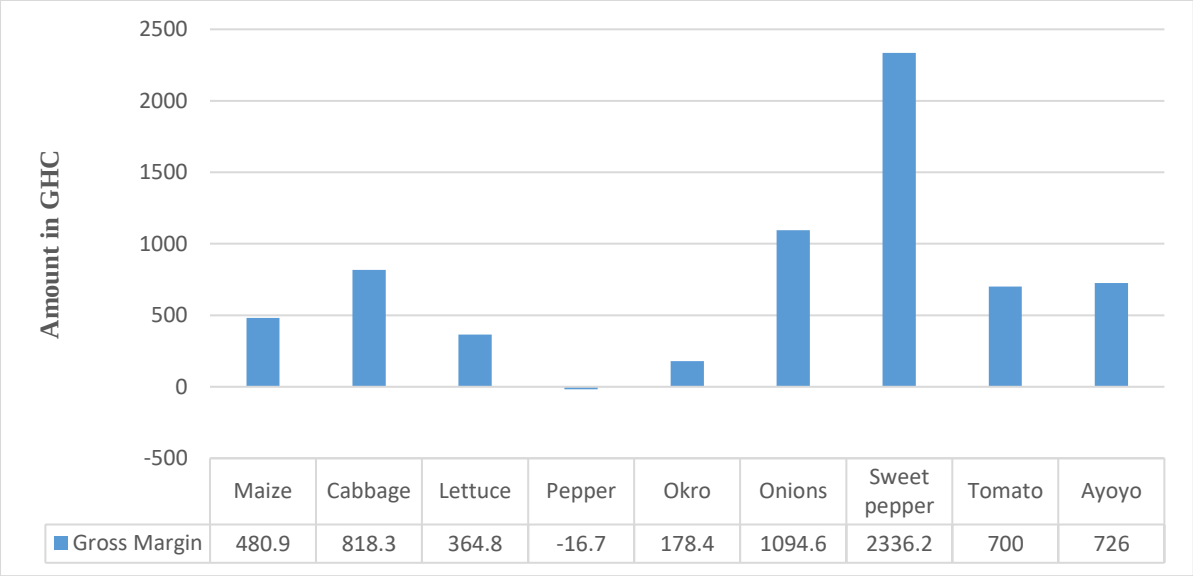
Source: Field Survey, 2017

4.4.2 Profitability and Gross Margins in UPA

The profitability and gross margin of UPA earned in the areas indicates that farmers carry out UPA as a business enterprise. Within sound economic and agricultural service provision, (efficient and appropriate extension service delivery, access to land inputs, credit and market, backed by effective monitoring) an average UPA farmer earns a gross margin of GHC 599, GHC 1145 and 47 GHC per hectare per season (Table 7) in Tamale, Accra and Sunyani respectively. Gross margin obtained from the cultivation of vegetables in Accra was the highest followed by Tamale and then Sunyani in that order. This confirms the role of high demand in increasing prices for vegetables which is attributable to the high disposal income of consumers within Accra and its environs. With regular availability of water for irrigation, farmers can significantly increase their all year-round profits. These gross margins and profitability figures were calculated from cultivation the vegetable crops; the costs and incomes from petty trading, salaries, and other non-farm activities and sources, were not

taken into account. Some researchers (Nugent (2000, 2001); Itty (1992); Armar-Klemensu and Maxwell (2000); Fialor (2002); Danso et al. (2002b) have all affirmed the profitable nature UPA activities in urban settlements and its poverty reduction ability. With adequate support to access land, improved land use rights and tenure security, the profitability of UPA can improve.

Figure 7: Gross Margin of UPA Crops in the Study Area



	Maize	Cabbage	Lettuce	Pepper	Okro	Onions	Sweet pepper	Tomato	Ayoyo
Gross Margin	480.9	818.3	364.8	-16.7	178.4	1094.6	2336.2	700	726

Source: Field Survey, 2017

Relatively high profits mean that farmers' food security level, household needs, investments and wellbeing are improved and catered for. According to the Ghana Living Standards Survey Round 5 (GLSS 5, 2008) report, the average annual household income from agricultural activities in Ghana is about GHC340.00 Comparing this figure to the average income/ha for the UPA farmers in each city as indicated in Table 7, the latter shows a higher level of earning than the former national average earning of farmers generally. Onyango (2010) explained that, with a developed value chain system for UPA, secured land, ready market, available storage facilities for the perishables, urban poverty and hunger can be halved by UPA. Accra alone according to Obuobie (2006) has over 200,000 vegetable consumers with a further claim that 32% of national household food budget is spent on vegetables produced by UPA.

Apart from the cash benefits that UPA practitioners get as revealed in Table 7, statements expressed during FGDs show that UPA provides opportunities for side employment to public sector workers and students.

> ***"****Urban and peri-urban agriculture is a sure way of generating income for our households. Most of the cash expenses are met through urban and peri-urban agriculture because the bush farms are mainly arable crops for house consumption. Public workers and students are also able to practice it and complement their income"* ***(FGDs, Nsuatre, Sunyani)***

The opportunity to farm in urban and peri urban areas will cut travelling cost to farming communities in the rural areas and this will result in earning additional income.

On land use and tenure security amongst farmers, the study sought to find out farmers' land tenure security level in these areas. During focus group discussions, the group in Accra and Sunyani revealed a higher risk of land tenancy insecurity. In Accra;

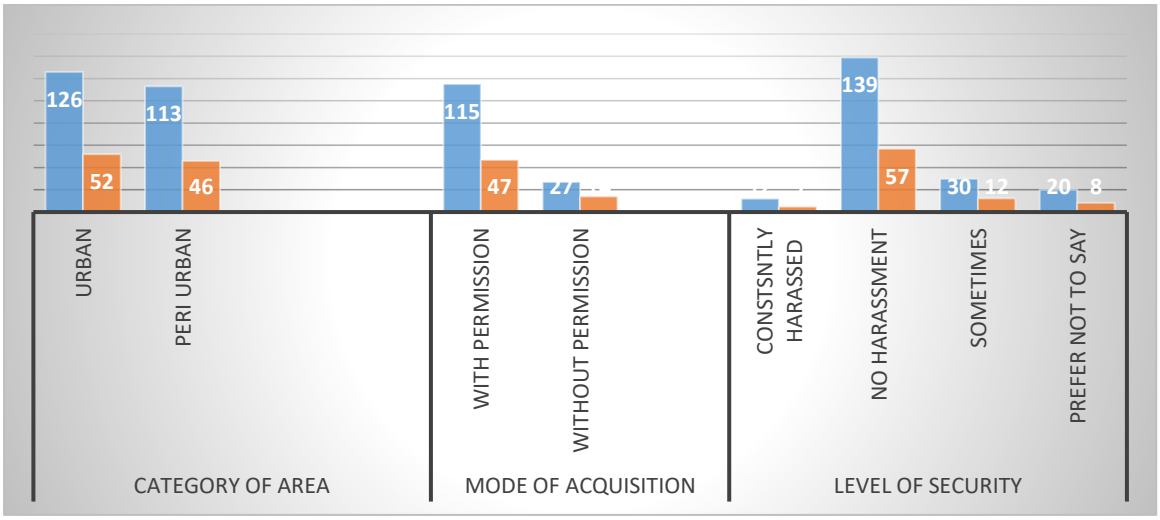
> *"Accra is Accra. Your land can be taken from you at any time whether with permission, agreement or without. If the owner can get better use of his/her land, they don't care about your agreement with them. So we are ready all the time knowing that they can take the land especially for construction. Our group members who are occupying government lands are better. For government land, it takes time for them to take it back and we all want unused government lands".* **(FGD Field Data, 2017, Accra)**

In Sunyani, they revealed that;

> *"Private owners do take their lands from us and they always inform us especially if we have an agreement or permission. But it is not so rampant, with permission we are secured for some period" (***FGD Field Data, 2017, Sunyani)**

From the findings, it is observed that the mode of acquisition of the land determines the level of tenure security. Those with permission from the land owners were exposed to low risk and there is higher risk for the squatters and those without permission (Figure 7).

Figure 7: Mode of land acquisition and security



Source: Field Survey, 2017

4.5. Major Areas of Production and Marketing of UPA Livelihood Activities

Market access for vegetables is not a major problem as revealed by the study. The major production areas as captured in Table 11 show that these communities have areas of more or better water resources/valleys suitable for agricultural purposes. Studies done by IWMI (2014) Obuobie et al. (2007), Bellwood-Howard et al. (2015) including MOFA reports also affirm some of these areas as major UPA production areas.

Table 11: production and Market Areas of crops

City	Production areas		Market outlets	
Tamale	Chogu	Water works area	Central market	Aboabu
	Gumbihini	Chefuriguni	Vodafon wall	Zagyuri
	Nyanshegu	Kalpohin	Chogu	Koblimahigu
	Zagyuri	Katariga	Fuo	Bulpela
	Bulpela	Gurugu		
	Koblimahigu	Fuo		
Sunyani	Chiraa	Odumasi	Yawhia	Chiraa
	Abesim	Nwawasua	Nsuatre	Odumasi
	Yawhia	Nsuatre	Sunyani	
	Sunyani West	Market circle		
	Chiraa Zongo	Fukuo Krom		
Accra	Ashaima	IDA	Ashaiman	
	Jericho	Atomic Haatso	Legon	Motor way
	Legon	Dzorwulo	Dzorwlo	Boteiman
	Tema	Boteiman	Atomic	
	Opeibia	Madina	Madina	
	CSIR	VRA		

Source: Field survey, 2017

Farmers revealed that these production areas are chosen because of several factors which include regular access to water (waste water, irrigated water, pipe born water, from wells, streams and dams, boreholes and rain-fed systems) which make vegetable farming flourish better. The choice of these areas is also due to the proximity to their homes, places of work and to the markets. The cluster of vegetable farms in such areas exposes farmers there to peer learning and sharing of experiences especially regarding good agricultural practices.

Regarding the marketing of produce, the study found that the farm gate system of marketing was practiced in all the three cities of Accra, Tamale and Sunyani. Middlemen and women marketers go directly to vegetable farms to make purchases from the farmers. In this regard, farmers do not struggle to sell their produce. Aside that, the locations of their farms are closer to market centres in each of the communities. This confirms Abdul-Halim and Abdul-Ganiyu's (2014) study which reveals that, about 70% of the UPA farmers sell their crop commodities at the farm gate level and prices to middle women and men. This current study observes that the prices of the vegetables were relatively cheaper in Tamale than in Sunyani and Accra respectively. The farmers revealed that, whilst they sell their produce to the market women often at cheaper prices at the farm gate level, the market women benefit more than they the farmers as the traders sell at higher prices at the market centres. Another finding is that farmers lose more incomes during the raining season, when there is glut on the market arising from widespread cultivation of vegetables in people's backyard gardens and the excess supply has to be sold at very low prices to cut down on loses from the perishability of the commodities due to lack of adequate cold storage facilities.

Though urban farmers have relative easy access to markets, the general public's perception about the quality of produce has been key factor undermining their business. Farmers intimated that the general public view that they all use contaminated water in producing their vegetables adversely affects the level of demand for vegetables and the volumes they are able to sell. During FGD's, the majority of respondents countered that view and indicated that they use good and safe water to irrigate their crops and assured the public of contaminated free vegetables. For instance, during a FGD in Tamale, a respondent said:

> *"The water we use is not of low quality at all, but sometimes we use waste water during water shortage in the dry season which is not so good but it is naturally filtered. In the raining season, we resort to water from the stream"*
> ***(FGDs, Koblimahigu, Tamale**).*

The view expressed is an acknowledgement by some of the UPA farmers that they use wastewater for irrigating their farms during the dry season, when they lack access to other sources of safe water. One advantage of this method is that it provides UPA farmers with cheap irrigation water, as well as variety of nutrients for their crops. However, there are important associated health risks in the usage of wastewater for irrigating farms to both consumers and UPA farmers. In this regard, UPA farmers acknowledged that the need for more education on the health risks associated with re-use of wastewater for UPA activities.

> *"urban and peri-urban agriculture is beneficial to our livelihoods because we use a lot of urban and peri-urban wastes as farm yard manure" (**FGDs, Atomic junction, Accra)***

This practice by many UPA farmers has both agricultural and environmental implications. In terms of agricultural production, the practitioners of UPA need to be trained in the safe conversion of urban waste into fertile farm composts/ manure to achieve higher yields. Environmentally, UPA farmers could become a key part of the urban environmental management system. This practice has the potential of helping reduce the large amounts of waste that need to be transported out of the cities and towns in Ghana.

CONCLUSION AND RECOMMENDATION

5.1. CONCLUSIONS

The study clearly shows that UPA policies have been quite prominent in Ghana's agricultural policy documents, and that the institutions with the required mandates for implementing these policies exist. Despite this institutional framework, there have been no definite implementation mechanisms to effectively execute these policies in the field. A review of the policies, laws/ by-laws and regulations shows that the Ministry of food and Agriculture (MoFA) has policies on UPA. FASDEP I & II and METASIP explicitly mention issues in relation to UPA but MoFA has no regulatory authority like the Land use and Spatial Planning Authority (LSPA) to designate special areas for UPA. Consequently, MoFA's implementation of UPA policies appears not be working. Even though LSPA (formerly the Town and Country Planning Department) is now a regulatory, mentoring, advisory and monitoring institution, the law establishing it – the Land Use and Spatial Planning law has no specifically pronounced policy on UPA aside general land use management and zoning. Further analysis of the country's policies and legislation on UPA indicates levels of overlapping and competing responsibilities between the LSPA and the mandates of Metropolitan, Municipal and District Assemblies (MMDAS). It is noted that because the MMDAs have not prioritized UPA activities no enabling bye laws have been enacted to promote this economic activity. The implementation challenges at the LSPA and MMDA levels with regard to demarcation of lands for UPA require effective implementation mechanisms including bye laws to make the policies achieve the desired impact.

Land use in UPA is continuously changing due to high demand for alternative uses of land

UPA farmers have access to both government and private owners' lands in the big towns and cities. With time and economic development in the big towns and cities, land use trends are changing. Hitherto open spaces and other lands used for UPA have been taken over by real estate and community development, commercial and industrial purposes. Such developments have posed threats to land tenure security of UPA farmers and have affected their activities.

UPA is highly Profitable

From the study, it has been established that UPA is not only a profitable venture, but also a strong livelihood option for farmers in the urban/ peri-urban space. With seasonal gross margins of GHC 1,094.60, GHC 818.30, GHC 364.80 and GHC 2,336.20 for onions, cabbage, lettuce and sweet pepper respectively per hectare, the production of these crops within UPA environments is rewarding. UPA production activities is mostly undertaken in clusters with good access to water resources, and have a history of vegetable production as well as relative easy access to market. These factors of production and marketing generally enhance the profitability of UPA.

5.2. POLICY RECOMMENDATIONS:

Based on the findings and conclusions of the study, the following four broad recommendations is hereby made.

1. Integrate Legal and regulatory support at all Levels

UPA issues should be integrated into all land development policies and MMDAs should be encouraged to enact enabling bye laws to provide comprehensive and transparent guidelines for the development of UPAs at those levels. This will ensure that UPA activities are regulated to ensure good agronomic practices, environmental protection and for sustainable production and supply of food to the urban areas. National and local governments should support the provision of affordable urban lands with long term tenure security in designated areas.

2. Strengthen Institutional Collaborations

Due to the fact that implementation of UPA at the MMDA levels has been hampered as result of the different mandates and responsibilities of Ministry of food and Agriculture (MoFA), Land Use and Spatial Planning Authority (LSPA), there is the need to strengthen coordination and collaboration between them. Such collaboration could lead to demarcation of agriculture lands in urban and peri-urban areas solely for UPA. These demarcated areas should be gazetted as UPA lands. MoFA and LSPA should create desk offices in their departments at all levels to promote UPA activities in urban and peri-urban areas.

3. Build Capacities of UPA Farmers in GAPs and Phyto Sanitary Measures

To ensure that UPA farmers produce quality and hygienically safe commodities, MoFA and the other institutions should build the capacities of the UPA practitioners on GAPs. Training in the safe application of agrochemicals and post-harvest handling (including phyto sanitary measures) will protect the farmers, consumers and the environment. Regular monitoring of UPA activities should be mainstreamed into the support of UPA to ensure compliance with GAPs and environmental protection laws. Ghana Water Company limited and MMDAs should endeavour to put in place mechanisms that promote safe water recycling and treatment in cities to enhance the quality of water used for UPA activities.

4. Strengthen UPA Associations

UPA stakeholders such as MoFA, LSPA and development partners should support the establishment and strengthening of UPA associations. Strong UPA farmer organizations will be critical in ensuring representation of the interests of UPA farmers, assist them in their production, and marketing activities and contribute to urban and peri-urban policy making and programme planning. Strengthened UPA Associations can effectively contribute to the current governments Planting for Food and Jobs programme aimed at increasing agricultural production.

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ANNEXES

Annex 1 Community Selection in regions

Cities	Communities	Sample size of farmers
Tamale	Gumbihini	10
	Nyanshegu	10
	Bulpela	10
	Chefurigini	10
	Gurugu	10
	Koblimahigu	10
	Zagyuri	10
	Fuo	10
Accra/Tema	Legon	10
	Ashaiman	10
	Motor Way/Boteima	12
	Dzorwulo	12
	Jericho	10
	Korlebu	10
	CSIR	10
	Madina	10
Suynani	Yawhiima	10
	Kontonkrom	10
	Nwowasu	10
	Odumase	10
	Nsoatre	15
	Chiraa	10
	Abesim	15
Total *Respondents		**244**

Annex 2. Crops/Vegetables produced by farmers

Crops	Frequency	Percent
cabbage	**38**	**15.6**
lettuce	**26**	**10.7**
Chilli/Hot pepper	8	3.3
okro	**22**	**9**
Cow pea leaves	2	0.8
Amaranthus/Spinach	5	2.08
onion	**25**	**10.2**
garden egg	2	0.8
Ayoyo	4	1.6
sweet pepper	8	3.3

tomato	5	2
maize	**71**	**29.1**
plantain	12	4.9
cocoyam	3	1.2
groundnuts	1	0.4
others	6	2.5
Total	240	100

ANNEX 3- SURVEY QUESTIONNAIRE

UNIVERSITY FOR DEVELOPMENT STUDIES
FACULTY OF AGRIBUSINESS AND COMMUNICATION SCIENCES
NYANKPALA CAMPUS, TAMALE

CHANGING ACCESS AND USE PATTERN OF LAND IN URBAN AND PERI-URBAN AREAS: A THREAT TO AGRICULTURAL PRODUCTION IN GHANA

(SURVEY INSTRUMENT)
SECTION A: SURVEY INSTRUMENT IDENTIFICATION AND TRACKING
1. Survey Instrument ID No.: |_____|

2. Region_____ 3. City/Town _____

4. Community/Neighborhood_____ 5. Location/Site_____

6. Category of Location/Site: 1. Urban; 2. Peri-urban; |___|

7. Respondent's Name_____ 8. Contact (if any) _____

9. Category of Respondent: 1. Crop Farmer; 2. Livestock Farmer; 3. Marketer; |___|

10. Name of Interviewer_____ 11. Place of Interview_____

12. Time: |___|___||___|___| 13. Date: |___|___||___|___||___|___|

SECTION B: GENERAL INFORMATION ON RESPONDENT

14). Age (in years)	15). Status in the HH	16). Sex	17). Marital Status	18). Level of Education	19). Major Occupation	20). HH Members' Age Distribution		20). Total HH Size
						Male	Female	

Codes:
Status in the HH: 1= HHH, 2=Wife, 3=Sibling, 4=Relative 5=Other (specify)
Sex: 1=Male, 2=Female,
Marital Status: 1=Married, 2=Single, 3=Divorce, 4=Widow/Widower
Age distribution: 1=under 6yrs, 2=6-17yrs, 3=18-35yrs, 4=36-50yrs and 5= >50

Level of education: 1=None, 2=Non-formal education, 3=Primary, 4=JHS/Middle School, 5=Secondary/SHS, 6=Islamic/Arabic, 7=Tertiary (e.g. University, College, Polytechnic or equivalent) and 8=Other (specify)
Major occupation: 1=Farming, 2=Salary employed, 3=Trading and 4=Others (specify)

SECTION C: LIVELIHOODS, CHARACTERISTICS AND LOCATIONS

22. If crop farmer as in (Q9. (1) above), provide details of your farm enterprise last year.

No.	Crop Type (*please fill in ONLY the code)*	Land/ Plot Size (Acres)	Main reason for cropping: (1) Food (2) Cash (3) Other (specify)	Yield obtained last year (bags/acre)	Quantity sold last year (bags)	Quantity consumed last year (bags)	Quantity given out last year (bags)
1							
2							
3							
4							
5							

Crop Type Codes: 1=Cabbage; 2=Lettuce; 3=Chilli/Hot pepper; 4=Okro; 5=Cow pea leaves; 6=Amaranthus/Spinach; 7=Onion; 8=Garden eggs; 9=Ayoyo; 10=Sweat paper; 11=Tomato; 12=Cauliflower; 13=Carrot; 14=Maize; 15=Plantain; 16=Cocoyam; 17=Ground nuts; 18=Other (specify----------)

23. Which of the following best describe your land/plot?

No.	Crop Type (*please fill in ONLY the code)*	Land/ Plot Description	Mode of Acquisition (*1=by permission; 2=without permission*)	Level of Security (*1=no harassment; 2=constantly being harassed*)
1				
2				
3				
4				
5				

Codes for land/plot description:
1=backyard garden; 2=reserve areas along highway/shoulders of roads; 3=undeveloped government land; undeveloped private land; 4=river banks; 5=along streams; 6=along waterways/spillways/sewage ways; 7=valley/wetland; 8=open-space intra-urban; 9=open-space peri-urban; 10= along rail lines; 11=along electricity lines; 12=designated irrigated land; 13=designated non-irrigated land; 14=unplanned public land; 15=others (specify----------)

24. What challenge did you face acquiring the land/plot?
……
……

25. What source of water are you using in crop farming? a). Rain-fed b). Stream c). River d). Dugout/spring e). Gutter/waste water f). Irrigation g). Pipe-born/borehole h). Others (specify)…….

26. Please provide the detail on your water usage in the table below.

No.	Water source	Cost of water last year (GHS) (if any)	Water quality (1=excellent, 2=very good, 3=good and 4=poor)
1	Rain-fed		
2	Stream		
3	River		
4	Dugout/spring		
5	Gutter/waste water		
6	Irrigation		
7	Pipe-born/borehole		
8	Others (specify)……..		

27. Provide details of the quantity of produce sold last year.

No.	Crop Type	Unit Price (GHS)	Total Quantity Sold (bags)	Place/Market Sold (1=farm gate, 2=satellite market, 3=distant market, 4=other (specify)
1				
2				
3				
4				
5				

28. Please provide detail on the place and persons sold to last year.

No.	Place/Market Sold	Market location	Crop type	Category of persons sold to					
				Consumer		Retailer		Wholesaler	
				Total Qty sold	Unit Price (GHS)	Total Qty sold	Unit Price (GHS)	Total Qty sold	Unit Price (GHS)
1	Farm gate								
2	Satellite market,								
3	Distant market								
4	Other (specify)…….								

29. If sold in the market, what is the distance from your farm to the market? (km)…….

LIVESTOCK FARMERS' SECTION

30. If livestock farmer as in (Q9. (2) above), provide details of your livestock enterprise last year.

No.	Type of Animal	Herd Size (in numbers)	Number of years of rearing	Main reason for rearing: (1) Food (2) Cash (3) Other (specify)
1				
2				
3				
4				
5				

31. Please provide detail on the place and persons sold to last year.

No.	Place/Market Sold	Market location	Crop type	Category of persons sold to					
				Consumer		Retailer		Wholesaler	
				Total Qty sold	Unit Price (GHS)	Total Qty sold	Unit Price (GHS)	Total Qty sold	Unit Price (GHS)
1	Farm gate								
2	Satellite market,								
3	Distant market								
4	Other (specify)…… ….								

32. If sold in the market, what is the distance from your farm to the market? (km)…….

SECTION D: INPUT REQUIREMENTS, COST AND PROFITABILITY OF LIVELIHOODS

33. Cost of Inputs on your crop farm last year.

Input Type Used	Fertilizer Usage			Source of Inputs
	Qty (# of bags)	Price (GHC/bag)	Qty (Litres)	
NPK				
SA				
Urea				
Organic				
Field pesticide				
Weedicides				
Storage pesticides				

Other (specify)……				

34. Labour Cost on your crop farm last year.

Farm activity (where applicable)	Family labour				Hired labour					
	Male		Female		Male			Female		
	Qty	# of days	Qty	# of days	Qty	# of days	Wage (GHC)/day	Qty	# of days	Wage (GHC)/day
Land clearing/ stumping										
Ploughing/ripping										
Harrowing										
Planting/sowing										
1st Herbicide /weedicide application										
1st weeding: Manual										
2nd Herbicide /weedicide application										
2nd weeding: Manual										
Fertilizer application										
Insecticides/Fungicides application										
Harvesting										
Primary processing										
Packaging/Bagging										
Transportation										
Seeds										

35. If livestock farmer, please provide details on cost of production.

Supplies	**Unit Cost (GHS)**	**Total**
Feeding/feed supplements		
Veterinary services		
Housing		
Pen attendant		
Day old chicks		
Electricity/water		
Transportation		
Other (specify)……		

SECTION E: LAND COST, CHANGING LAND USE PATTERNS, SECURITY, ACCESSIBILITY AND SUSTAINABILITY OF URBAN AND PERI-URBAN AGRICULTURE

36. Provide details of your farm land/plot in this table.

No.	**Type of Land/ Plot Area**	**Type of land/plot ownership**	**How long have you been using the land/plot?**	**How long can you continue to use the land/plot?**	**Reason for the years of continue usage**
1					
2					
3					
4					
5					

Code for Type of land/plot ownership: 1=owner cultivated; 2=rented; 3=purchased; 4=borrowed; 5=squatting; 6=other (specify……..)

37. If type of land/plot ownership is owner cultivated, which of the following best describe your ownership?

(1) Family owned (2) Community owned (3) Personal ownership by purchase (4) Borrowed (5) Other (specify)……

38. If rented or purchase how much is paid per year? (GHC) …….

39. If borrowed or crop sharing, state terms?

(1) Borrowed for a period for free
(2) Share crop/income from sale 1:1 (Land lord: tenant)
(3) Share crop/income from sale 2:1 (Land lord: tenant)
(4) Share crop/income from sale 1:2 (Land lord: tenant)
(5) Other (specify).....

SECTION E: LAND USE INFORMATION FROM 2000 TO 2016

(GIS Data to be obtained from Secondary Sources – preferably Satellite Data taken over 15years period)

40. Please provide information on the following land used types in your city/town.

Land Used Type	Years							
	2000	2001	2002	2003	2004	2005	2006	2007
Farmland								
Built-up Land								
Unused Land								

Land Used Type	Years								
	2008	2009	2010	2011	2012	2013	2014	20015	2016
Farmland									

Built-up Land									
Unused Land									

41. Please provide information on population of the following cities/towns.

City/Town	Years							
	2000	2001	2002	2003	2004	2005	2006	2007
Tamale								
Sunyani								
Accra								

City/Town	Years								
	2008	2009	2010	2011	2012	2013	2014	20015	2016
Tamale									
Sunyani									
Accra									

Annex 4- FOCUSED GROUP DISCUSSION GUIDE

A. General Issues

1. Region_____ 2. City/Town _____

3. Community/Neighborhood_____ 4. Location/Site_____

5. Name of Moderator_____

6. Date of FGD: |___|___||___|___||___|___ 7. Time: |___|___||___|___|

8. Moderator's Contact Number_____

DISCUSSANTS

Number	Male	Female

Interviewer……
Date……
Name of land development agency ……
1. Name……...
2. Sex [ ] Male [ ] Female

A: LAND USE POLICIES AND BYE-LAWS GUIDING UPA AGRICULTURE IN GHANA

1. What are the current regulatory frameworks for UPA agriculture lands?
2. What guidelines must be provided to effectively promote UPA agriculture?
3. What are some of the rights of UPA agriculture farmers?
4. How are the rights of UPA agriculture farmers protected?

5. What are the opportunities for UPA land use policies under the traditional communal system?
6. What are the challenges for UPA land use policies under the traditional land customary system?
7. What are the opportunities of the English common law system for UPA agriculture?
8. What are the challenges of the English common law system for UPA agriculture?
9. What are the laws guiding land use for UPA agriculture?

B: ROLE OF KEY INSTITUTIONS/ORGANIZATIONS IN PROMOTING UPA AGRICULTURE

1. What is the purpose for establishing your organization?
2. What is the structure of your organization?
3. What role(s) is/are played by your organization in promoting UPA agriculture?
4. What processes are involved in acquisition of land for UPA agriculture?
5. What policies do you have in place concerning access to land for UPA agriculture?
6. What policies do you have relating to the usage of UPA agriculture lands?
7. What land use policy has your organization developed to protect lands for UPA agriculture?

C: CHALLENGES FACED BY INSTITUTIONS/ORGANIZATIONS IN PROMOTING UPA AGRICULTURE

1 What are some of the challenges encountered by your organization in promoting UPA agriculture?
2 What is your institution's response to the challenges of UPA agriculture?

D: SUGGESTIONS FOR PROMOING UPA AGRICULTURE IN GHANA

1. What do you think could be done to improve the current management of UPA agriculture?
2. In your view, what plans can we put in place to create effective land use policies to guide UPA agriculture lands?
3. What guidelines must be provided to effectively enforce the by-laws for UPA agriculture?
4. What is the capacity of your organization to formulate policies to promote UPA agricultural?

E: CHANGING LAND USE PATTERNS IN CITIES AND TOWNS IN GHANA

1. What are some of the effects of urbanization on the sustainability of UPA agriculture activities in Ghana?
2. How has urbanization affected the demand for UPA agriculture lands in cities and towns in Ghana?
3. What are some of the causes of changing pattern of land use in cities and towns in Ghana?
4. What are the opportunities for converting UPA agriculture lands for residential/ industrial purposes?
5. What are the effects of converting UPA agriculture lands for residential/ industrial purposes?

F: FARMING METHODS, TECHNOLOGIES AND MARKETING OF UPA AGRICULTURE PRODUCE

1. What farming method(s) do you use for your UPA agriculture?
2. What farm inputs do you use to enhance productivity?
3. Who are the main suppliers of your farm inputs?
4. What are the effects of the inputs used on production?
5. What are the environmental effects of some of the inputs used on production?
6. How do you access water for your farms?
8. What forms of retail and wholesale outlets have you used to market your farm produce?
9. Who are your target customers?
10. How do you identify your target market?
11. How do you ensure that your farm produce are safeguarded from hazardous chemicals?

Annex 5-KEY INFORMANTS INTERVIEW GUIDE

B. General Issues

1. Region_____ 2. City/Town _____

3. Community/Neighbourhood_____ 4. Location/Site_____

5. Name of Moderator_____

6. Date |___|___||___|___||___|___ 7. Time: |___|___||___|___|

8. Moderator's Contact Number_____

DISCUSSANTS

Number	Male	Female

Interviewer……
Date……
Name of land development agency ……
1. Name……...
2. Sex [ ] Male [ ] Female

A: LAND USE POLICIES AND BYE-LAWS GUIDING UPA AGRICULTURE IN GHANA

10. What are the current regulatory frameworks for UPU agriculture lands?
11. What guidelines must be provided to effectively promote UPU agriculture?
12. What are some of the rights of UPU agriculture farmers?
13. How are the rights of UPU agriculture farmers protected?

14. What are the opportunities of UPU land use policies under the traditional communal system?
15. What are the challenges of UPU land use policies under the traditional land customary system?
16. What are the laws guiding land use for UPU agriculture?

B: ROLE OF KEY INSTITUTIONS/ORGANIZATIONS IN PROMOTING UPU AGRICULTURE.

8. What is the purpose for establishing your organization?
9. What is the structure of your organization?
10. What role(s) is/are played by your organization in promoting UPU agriculture?
11. What processes are involved in land acquisition for UPU agriculture?
12. What policies do you have in place concerning access to land for UPU agriculture?
13. What policies do you have relating to the usage of UPU agriculture lands?
14. What land use policy has your organization developed to protect lands for UPU agriculture?

C: CHALLENGES FACED BY INSTITUTIONS/ORGANIZATIONS IN PROMOTING UPU AGRICULTURE

3 What are some of the challenges encountered by your organization in promoting UPU agriculture?
4 What is your institution's response to the challenges of UPU agriculture?

D: MANAGEMENT OF UPU AGRICULTURE IN GHANA

5. What do you think could be done to improve the current management of UPU agriculture?
6. In your view, what plans can we put in place to create effective land use policies to guide UPU agriculture lands?
7. What guidelines must be provided to effectively enforce the by-laws for UPU agriculture?
8. What is the capacity of your organization to formulate policies to promote UPU agricultural?

E: CHANGING LAND USE PATTERNS IN CITIES AND TOWNS IN GHANA

6. What are some of the effects of urbanization on the sustainability of UPA agriculture activities in Ghana?
7. How has urbanization affected the demand for UPU agriculture lands in cities and towns in Ghana?
8. What are some of the causes of changing pattern of land use in cities and towns in Ghana?
9. What are the opportunities for converting UPU agriculture lands for residential/ industrial purposes?
10. What are the effects of converting UPU agriculture lands for residential/ industrial purposes?

F: FARMING METHODS, TECHNOLOGIES AND MARKETING OF UPU AGRICULTURE PRODUCE

1. What farming method(s) do you use for your UPU agriculture?

2. What farm inputs do you use to enhance productivity?

3. Who are the main suppliers of your farm inputs?
4. What are the effects of the inputs used on production?
5. What are the environmental effects of some of the inputs used on production?
6. How do you access water for your farms?
8. What forms of retail and wholesale outlets have you used to market your farm produce?
9. Who are your target customers?
10. How do you identify your target market?
11. How do you ensure that your farm produce are safeguarded from hazardous chemicals?