Space, Land-Use Planning and the Household Economy:
The Role of Urban Agriculture in the Accra Metropolitan Area, Ghana.

By

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A Thesis Submitted In Conformity With The Requirements For The Degree of Doctor of Philosophy Graduate Department of Geography University of Toronto

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The implementation of the Structural Adjustment Program have brought untold hardship to millions of urban residents in Ghana to the point of undermining their social safety nets. In response to growing economic hardship, an increasing number of residents in Accra are resorting to urban cultivation as a means of meeting their household needs. Information obtained from a field survey reveals that urban cultivation in Accra contributes, significantly, to the household economy of the practitioners in the form of providing food, generating income, reducing household budget, recycling household wastes, and abating floods. The research also demonstrates that the extent to which urban cultivation is beneficial to urban farmers differs on the basis of gender, household income, garden location and land security.

The study identifies critical variables in Accra that have influenced the evolution of farming in the metropolis over the years. Such variables could be described as either prohibitive, discouraging or encouraging to urban agriculture. In addition, the research identifies various institutional constraints on urban agriculture and how they have hindered the swift growth of urban cultivation in the Accra Metropolitan Area (AMA). But the good news is that, urban agriculture in Accra is a mobile activity, and has evolved a series of adaptive responses to these threats. The research finds that variations in land value, distance of urban gardens from the CBD and land tenure arrangement go a long way to influence a gardener decisions on what to produce, where to produce, who produces, when to produce and why to produce.

This research has also demonstrated that urban cultivation in Accra is not a temporary, stop-gap measure to combat food scarcity, but a permanent initiative on the part of the urban poor to improve their standard of living; in other words, urban agriculture in Accra is a long-term phenomenon which reflects a transformation of the urban landscape to the realities of urban needs and priorities. To promote urban cultivation in Accra, the author suggests means of incorporating urban agriculture into the urban management of Accra through policy formulation, land-use zoning, institutional regulations and infrastructural development.
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1.1 RESEARCH QUESTION

Urban food insecurity is one of the significant issues undermining sustainable development in African cities. As more people decide to live in cities in Africa, feeding them has become an onerous task. In Ghana, a trend is emerging where rural areas are falling short of producing enough food to feed the growing urban population. In the Accra Metropolitan Area (AMA), in particular, the problem of food accessibility is becoming acute as more rural people, due to either rural poverty, rural unemployment or environmental degradation, are migrating to the metropolis. In addition, the prevalence of urban poverty and rising urban unemployment have intensified the problem of food accessibility in Accra. The growing problem of food scarcity in Accra has translated into a higher cost of living, especially for the urban poor. UN data reveal that, world-wide, city dwellers spend more of their income on food than their rural counterparts (UNDP, 1996). In addition, the need for more food, particularly of high nutritional value, is most acute among the urban poor whose daily intake of calories is lower than that of the rural poor in most developing countries (Sanyal, 1987). Thus, to a large extent, the poverty problem facing the residents of Accra is manifested as a food security problem. Consequently, a number of residents in Accra are resorting to urban cultivation as a means of supplying food to the household and managing poverty. It is therefore my intention to undertake a practical and vivid assessment of the contribution of urban agriculture to the urban economy by using Accra as a case study to ascertain the actual extent to which the sector is an opportunity and a tool for sustainable urban development, especially in respect to household food security, poverty alleviation, income provision, employment generation and environmental management.
In the wake of growing unemployment and the higher cost of living in cities, the management of urban poverty in developing countries has become an important area of research and has consequently led to enormous policy debates among urban researchers, city authorities, policy makers and urban planners. However, in spite of the serious research attention paid to the management of urban poverty in developing countries, the role that food security can play towards the management of urban poverty in Africa is ignored in the policy debates by officials of most African cities (Maxwell, 1997). Maxwell argues that urban food insecurity, while very real, has become a politically invisible problem in African cities for a number of reasons. First, the issue of urban food insecurity is relatively invisible to urban planners and managers in comparison to more urgently visible urban problems such as unemployment, decaying infrastructure and poverty, although food insecurity and malnutrition are intimately linked with all of these other problems. Secondly, the general impression that urban residents are better off, economically, than their rural counterparts reinforces the invisibility of urban food insecurity. Thus, famine is perceived as a rural crisis and not as an urban phenomenon. Thirdly, urban food insecurity is made invisible to urban managers and national policy makers by the very nature of its manifestation; unless there are major supply problems, or sudden price hikes which affect a large percentage of the urban population negatively and simultaneously, urban food insecurity is a household phenomenon, and rarely becomes a community or area-wide issue. Thus, according to Maxwell (1997) the food problem in urban communities is not particularly linked to seasonal changes or other community-wide phenomena, but rather to the fortunes of households or even individuals within households. Thus, implicit in Maxwell’s argument is the notion that abject poverty can lie side by side with prosperity in urban communities, making the detection of food insecurity and vulnerability much more difficult. In brief, food insecurity in
African cities is much more an individual or household level phenomenon, and much less a community phenomenon, than in rural Africa.

The reaction to the “urban bias” thesis postulated by Michael Lipton has also intensified the neglect of food security in cities. Lipton’s thesis posits that some African leaders are more likely to appease the most vocal political interest, better organised urban constituencies by appropriating money, people, food and raw materials from the rural areas to restructure the urban economy (Lipton, 1988). At the centre of the “urban bias” argument is the issue of cheap food for a politically volatile urban populations. The attempt to correct the “urban bias” anomaly by national and international institutions has led to a series of economic development initiatives specifically directed toward rural communities while the poor in the urban centres were excluded. Thus, the reaction to the “urban-bias” thesis is another source of contemporary institutional blindness towards the problem of urban food security by planners and policy makers in African cities.

In her recent overview of urban food security, Atkinson noted that given the current trend of food supply and demand, the question of urban food security could become the “greatest humanitarian challenge of the next century” (Atkinson, 1995:152). She identified the decline of formal safety nets and their replacement by informal responses as the major issue to be considered in the analysis of food access in the urban community. She argues that the problem of urban food security hinges on entitlement failures; thus, urban poverty and declining real income are the major causes of urban food insecurity as they limit the ability of urban residents to acquire food from the urban market. The appropriateness of Atkinson’s assertion is underscored by the human impacts of the Structural Adjustment Program (SAP) implemented by some African countries, including Ghana, since the early 1980’s. The implementation of the SAP in Ghana has led to the end of state control in food pricing, marketing and distribution, and this has subsequently led to the escalation of food
prices, especially in the cities. In addition, the adjustment program has also led to the termination of thousands of public service jobs. Besides, the SAP undermined most of Ghana's social safety nets - food transfers, consumer subsidies and price controls. According to the World Bank (1995) and Alderman (1994), the impact of the economic restructuring of the structural adjustment program has contributed significantly to urban poverty in most countries where it was implemented. In Ghana, the social cost of the SAP was compounded by food supply failure which occurred between 1982-83 when a nationwide drought severely reduced the harvest, triggered massive food shortages and drove up food prices. At the height of this crisis, Nigeria expelled an estimated one million Ghanaian expatriates who had migrated to Nigeria during the economic boom of the latter. For many of the returnees, there was little alternative to self-employment in the urban informal sector.

By 1987, it was clear that the first phase of the implementation of the SAP (also known as the Economic Recovery Program) had brought unjust social costs on the Ghanaian population (Loxley, 1990). In response to the growing dissatisfaction with the social burden emanating from the implementation of the SAP, in 1988, the Government of Ghana, in conjunction with the World Bank, launched the "Program of Action to Mitigate the Social Cost of Adjustment" (PAMSCAD). The major components of the PAMSCAD initiative included a free food package, a government-financed retraining program and a short-term income supplement program - all intended to assist the "new poor" who emerged due to the implementation of the SAP. Thus, the PAMSCAD concept was intended as an institutional coping mechanism, or mitigating initiative, in response to the harsh economic realities brought on by the SAP. While it was couched as "adjustment with human face", Gayi (1995) noted that little progress was made by the PAMSCAD to identify vulnerable groups, specifically women and children, while Maxwell (1997) noted that, practically, the
PAMSCAD, which lasted for only a few years, was a tactical move intended to deflect opposition to the SAP, and not a deliberate anti-poverty strategy.

In the wake of the harsh realities of the SAP and the general economic depression in the 1980’s and 1990’s, a number of coping strategies were adopted by urban residents in Ghana. In 1996, a report by the Ga Mashie Study Team noted a wide variety of coping strategies adopted by the urban poor in Accra in response to the harsh economic realities from the late 1980’s to the mid 1990’s. These strategies can be grouped into the following categories: income-related strategies (diversification, migration and heavy reliance of remittances from family members); income pooling (either at the household or family compound level, or through saving groups); expenditure-reduction strategies (cutting expenditure on housing, health and education); consumption-reduction or rationing strategies (dietary change, rationing and reduction of consumption); commercialisation of ritual ceremonies; distress sales of personal effects; and petty crimes or anti-social activities (prostitution, petty crimes, and abandonment of spouses and children). The major response at the level of the household to the economic crisis and the ensuing policies of structural adjustment has been the need to diversify income sources or to seek an alternative job. With very limited job opportunities in the formal sector, coupled with the laying-off of thousands of civil servants in the late 1980s, most urban unemployed in Accra sought jobs in the informal sector.

In respect to the high cost of food in Accra, the major responses include making changes in the basic diet of the urban households, mostly by substituting expensive food commodities such as plantain and yam with inexpensive ones such as cassava and grains, and increasing use of small parcels of land in the city for agricultural production (Maxwell, 1997). This later response was also identified by Rogerson (1993), Sawio (1993), Freeman (1991) and Maxwell and Zziwa (1992) in other African cities. They indicated that, in terms of
direct entitlements to food, a common response to the economic crisis across Africa has been a resurgence of household-based agricultural production within cities. Thus, in order to improve their standard of living as well as to meet part of their household nutritional requirements, a growing number of urban dwellers in Accra are resorting to the cultivation of food crops in the metropolis. Thus, in Accra, an interesting scenario is emerging whereby there is a noticeable upsurge in household cultivation by the urban poor. According to the Ghana Statistical Services, in 1995, about 390,000 urban households (33%) in Ghana own or operate a farm or keep livestock (Ghana Statistical Services, 1995). With respect to Accra, specific estimate was not provided by the Ghana Statistical Service.

The resurgence of urban agriculture as an adaptive response to the unemployment and nutritional problems in African cities, unfortunately, has attracted the wrath of some policy makers, urban planners and law enforcement agencies in Africa. Maxwell (1997) noted that the institutional objection to urban agriculture as a recognisable urban land-use activity and viable economic venture came about because of a national agricultural policy which perceives agriculture as an engine of economic growth based on its dependence on the growth in domestic (urban) demand for continued impetus. Thus, Maxwell argues that since urban agriculture arose outside the realm of official planning or state control to secure a non-market source of food as a protection mechanism against the high cost of living, national planners fear that any state or municipal support for such a source of food will likely dampen urban demand for food, thereby undermining the fragile national recovery which significantly depends on agriculture. Implicit in Maxwell's argument is the view that the only way to protect food security for the urban poor is to stimulate greater rural production and not urban production. Some urban planners also perceive urban agriculture as a direct confrontation to initiatives to clean up the city, while for some urban managers the toleration of urban cultivation could reduce the value of prime land which could lower the investment
attraction of the city. As a result of these impressions, the metropolitan authorities in some African countries are urged by the business community, policy makers and the investment community not to tolerate or encourage food cultivation within the city. In Accra, the most evident form of this institutional intolerance is the C4 Unit of the Accra Metropolitan Authority (AMA) which is charged with the responsibility of keeping the streets in the CBD clear of street vendors and itinerant hawkers, and to destroy any activity whose location is contrary to the official layout. This unit often intensified its actions during important ceremonial periods such as the PANAFEST festival in 1994 when the metropolitan managers want to present a "modern city" image of Accra Metropolitan Authority (Ga Mashie Study Team, 1996).

The quest to transform AMA into a "modern city" has contributed significantly towards the present-day intolerance and prohibitive attitudes of the metropolitan authorities toward urban agriculture. The so-called "modern city" mentality and its incorporation into the planning and management of African cities constitute a colonial legacy. The main tenents of colonial urban policy in Africa, which were embedded in the Town and Country Act, were generally hostile to any form of informal activities. Colonial urban design was geared to the needs of the colonial settlers, often to the explicit exclusion of indigenous inhabitants. Architecture, urban layout and planning reflected European styles, fashions and norms, with occasional concessions to the local environment and climate (Simon, 1992). Before colonialization, indigenous settlements were scattered and isolated, and these permitted the cultivation of food and rearing of livestock in the open spaces between these scattered settlements. With the advent of colonialism, the physical form and structure of the pre-colonial settlements changed, as the colonial authorities either destroyed, ignored, or incorporated these settlements within a newly planned colonial city. Unfortunately, the social character of the vast majority of the indigenous people was not considered in the planning
and management of these new colonial-design settlements in Accra (Maxwell, 1997). Thus, under colonialism, urban planning was an imported concept from Europe. The colonial authority failed to appreciate that settlements such as Accra do not only comprise arrangements of concrete, steel and glass, but most importantly, that they are cultural artefacts reflecting the economic system, cultural values and social norms of the people. In short, the colonial authority was either unaware of, or declined to acknowledge, the socio-cultural specificity and planning implications of the indigenous people of Accra.

Most of the colonies in West Africa were established not for the purposes of large-scale European settlement, as was the case in East Africa. Instead, the motives were mercantile or resource extractive. In this regard, only a few lands were dispossessed from the indigenous people, with most of the lands bought or leased from the indigenous people under colonial tenurial arrangement. This led to significant changes to the traditional land tenure system, as communal use of land was replaced by private use. Thus, the traditional land tenure system, which hinges on communal ownership and use of land, and which provides the impetus to community activity such as community farming, was undermined by the replacement of communal land-ownership with private ownership. What made the above issues more troubling is that the impact of colonial town planning in Ghana has persisted way beyond colonialism to the present-day independence era. It would seem appropriate and important to indigenise town planning practice as part of the post-colonial changes. However, today's urban planning still exhibits remarkable continuity from colonial practice. Thus, post-colonialism in Accra came with the erection of a new symbol of nationhood, the national flag and national anthem, as well as changes to the names of some major streets, cities, monuments and state buildings; however, no changes were made to the Town and Country Planning Act to reflect the culture and the aspirations of the indigenous people (Simon, 1992). According to Simon, after the attainment of
independence, relatively few substantive amendments to the corpus of inherited planning law and practice have occurred in Africa. Thus, the colonial tradition of zoning which separates various urban functions is still being practised, providing a contrast with the multi-functional nature of land use in the informal sector where the social use of space owes much to the indigenous culture.

The inappropriateness of the existing town planning is manifested by the failure of urban planners and policy makers to manage the growth and development of African cities efficiently as mentioned by O'Connor (1983), Peil and Sada (1984), and Stren and White (1989). In Accra, the current urban development process in the periphery is characterised by haphazard and leap-frog developments. In addition, the legal framework pertaining to land tenure and land rights remains fraught with numerous conflicts associated with the use of urban land. The culminating effect of all these emerging developments has been the lack of available land to accommodate the informal sector (including urban agriculture) in the AMA. In addition, urban planning and planners have failed to improve conditions of the majority of the urban residents, especially the poor, as slum clearance and persecution of informal sector operators carried out in the name of order, aesthetics and public health have distorted the means by which the urban poor earn some livelihood. In Accra, the reactions of local authorities have been varied and complex in the past and present. Thus, such reactions have ranged from prohibition\(^1\) to intolerance, inaction, and accommodation\(^2\).

Until very recently, the issue of urban agriculture in developing countries has been overlooked as a subject for serious study. Part of the reason for this lack of attention might be that this form of urban land-use is perceived as seasonal and ephemeral and, hence, might have escaped the notice of researchers who concentrated on more visible,\(^\)

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\(^1\) There were instances when gardens were destroyed by the Accra Sanitation Task Force or gardeners forbidden to enter their gardens.
permanent forms of urban land-use (Freeman, 1991). The lack of research support to urban agriculture is also exemplified by Maxwell (1997), who insisted that much of the current research that analyses the issue of urban food security is in the fields of food and nutrition (for examples, Atkinson 1992; and von Braun et al. 1993) and not in the fields of urban development, urban management, or urban politics. He indicated that, for too long, food questions have been dropped off the agenda of urban planners, managers and political leaders. However, he observed that a high profile and visibility are suddenly being accorded to urban agriculture in Africa. He asserted that "having been absolute anathema to urban planners in Africa in the 1980s, the topic has recently become highly visible in part due to a new appreciation for its rationale, and in part because of high level attention given to the topic by international agencies". Thus, recently, urban agriculture is assuming much attention in social science research.

As noted by Striffeler (1987) and Honghai (1992), urban agriculture is emerging as an important urban research area with a considerable potential because there is a need to be practical in solving real day-to-day poverty and its related issues. Many calls have been made to urban planners to adopt a more flexible approach to urban planning, which should include institutional re-organisation, land-use reforms and accommodative regulations regarding multifunctional use of urban land (Watt and Watt, 1986; Aina, 1988; Awotona, 1988). However, some authors are disputing the claims that urban agriculture plays a very significant role in the nutritional and economic needs of the urban poor. For instance, Wade (1986) contends that the relatively small spatial coverage of urban farms makes their contribution to the urban economy insignificant vis-à-vis other forms of urban economic

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Gardens sited in some parts of Accra (abandoned areas and derelict sites) are sometimes permitted if they serve the purpose of safety and enhancing the aesthetic attraction of the area.
activities. Similarly, Gutman (1987) also argues that urban agriculture does not benefit the urban poor as much as it may seem, but rather benefits more the high-income group who could easily afford the use of urban land and access bank credits to undertake intensive, improved forms of urban cultivation. Thus, overall, these opposing authors seem to suggest that the potential of urban farming for meeting the food and nutritional needs of the urban poor and generating adequate income and employment opportunities for urban communities is over-stated. It is part of my objectives to assess the actual role that urban agriculture plays in the household economy of the urban gardeners in Accra. There is a growing need to emphasise this research niche so as to assess the practical contribution of urban agriculture to livelihood enhancement, urban development and its implication for management policy. It is essential that city officials and other planning authorities involved in addressing the needs of the urban poor understand the urgency of the food and income crises facing the urban poor, the potential of urban agriculture in solving the intricate problems of food, poverty and unemployment, and the need to create an enabling environment to support urban cultivation.

One may be pondering whether urban agriculture represents the best use of urban land in 20th century Accra vis-a-vis higher value uses such as commercial and industrial developments. It is important to note that physical development in Accra is not a continuous pattern but fragmented across space, creating patches of open green space or gaps in between developed areas. Thus, the expectation of a gradual intensive and concentrated development of physical structures from the outer city towards the inner city, as seen in most cities in the developed countries, is not quite evident in Accra. In Accra, gaps or open spaces are found between built environs and these have provided important niches for food cultivation within the city. Furthermore, there remain in the inner core (CBD) of Accra, open spaces which are unsuitable or not permitted for any physical development. These spaces
include conflict lands\textsuperscript{3}, stool lands\textsuperscript{4}, excavation sites, derelict lands, dump sites, parks and recreational sites, and sites adjacent to utility-right-of-ways. These sites are often utilised by residents to cultivate food within the city. Thus, the promotion of urban cultivation should not be seen as an attempt to limit intensification of land use in Accra's inner core as it mostly utilises lands which will remain undeveloped even with urban intensification. Furthermore, food cultivation within the city can be justified on grounds that it provides an alternative model of development, an ecological city, which emphasises the integration of physical development (physical materials) and organic development (biological materials). Thus, any land-use initiative which increases the intensity (input) to which a land is used but fails to create the means by which unused output (wastes) emanating from the intensification can be absorbed and reused within the built environment, is unsustainable. Food cultivation within Accra should be seen as a strategy to create an urban sink within the built environment to absorb the wastes and residues (organic) emanating from physical development in Accra. As the metabolism of Accra can be enhanced through organic recycling, there is growing need for society to change its perception of cities as an open system to that of a closed system, a system which closes the production-consumption-disposal loop in the city. It is important to note that achieving efficient land-use should not be at the expense of the environment; consequently, balanced development should be pursued by sacrificing some benefits associated with land-use intensification for the benefits of creating urban sinks, through urban agriculture, to absorb urban wastes.

\textsuperscript{3} In Accra, protracted land litigation often leads to the ban in the use of such land for any physical development by the court. Such court decision enables some residents to temporarily cultivate the land for food.

\textsuperscript{4} Traditionally, custom demands that stool lands are not to be used for permanent physical development but for temporary activities. This is because such lands are supposed to belong to the past, present and future members of that stool clan; hence, permanent use is not allowed.
Although there are other ways of recycling these wastes, such as land-filling and incineration, the problems of lack of finance, low technology and lack of appropriate land sites have limited the feasibility of these methods. Consequently, according to an official of the Waste Management Department of AMA, the current waste practices of land filling and open disposal are inefficient and ineffective, and they pose health risk to the public.

The study focuses on an African city because urban agricultural research in Africa is not well developed compared to similar research made in Asian cities. According to the International Development Research Centre (IDRC) report "In the late 20th century, the largest advances in production and marketing systems for urban agriculture are found in and around major Asian cities" (Mougeot, 1994). In addition, in the western world, urban agriculture is more of a recreational activity or conservational initiative as compared with Africa, where the operators of urban agriculture perceive the activity as an important survival niche. Among the countries in Africa, my choice of Ghana stems from two factors; first, Ghana is the first country in Africa to fully implement the SAP. Consequently the human cost of the adjustment has taken its full toll on Ghanaians who are advancing survival strategies, including urban cultivation, to cope with the growing threat of poverty emanating from the implementation of the SAP. Secondly, the colonial experience of Ghana provides the avenue to explore the role that colonial policy has played in the development of urban agriculture in Ghana. The choice of the Accra Metropolitan Area (AMA), among other Ghanaian cities, as the focus of the research stems from the fact that the metropolis is the most urbanised community in Ghana with the most rapid rates of population growth and unemployment; hence, there is a growing necessity for its residents to pursue activities in the informal sector to secure their livelihood. Furthermore, the AMA is the centre of national policy making and headquarters of most government departments and agencies; hence, research on urban cultivation which focuses on Accra could easily become conspicuous to
national planners and attract the attention of the national authorities as they live and work closer to the actions and events associated with the activity. It can be said that Accra is typical of other African cities of similar size. Like most African cities, Accra has gone through the processes of pre-colonial agrarian economy, colonial governance, European-style town and country planning, and post-colonial economic crises of unemployment and poverty. Thus, Accra shares similar experiences with most cities in Africa.

1.2 RESEARCH OBJECTIVES

To assess the feasibility of urban agriculture as a sustainable initiative to enhance the livelihood of urban households in Accra, I have pursued a number of related objectives. The first objective aims at providing a historical perspective on urban agriculture in the AMA. Over the years, the growth and development of urban agriculture in Accra have been shaped by local and national events and actions that have altered, distorted, tolerated or encouraged urban agriculture in the metropolis. The goal is to trace the evolution of urban farming in Accra as well as to unravel critical variables and factors that have shaped this development and account for such change. This objective will also enable me to identify and understand the transformation of urban cultivation in the face of threats from institutions, policy markers and planners.

The second research objective aims at examining the spatial context of urban farming in Accra. That is, to identify the various locations or sites of urban cultivation in Accra, to explore what factors, if any, account for the distribution of urban gardens across the urban space of Accra, and how the locations or sites have in turn shaped the operation of urban farming in that specific location. Exploring this objective is crucial to the study as it injects some spatial parameters in assessing the importance of urban farming to the people of Accra, examining the problems confronting urban agriculture, evaluating institutional
responses to urban cultivation, and proposing policy recommendations to promote urban
agriculture in Accra.

Since the availability of, and accessibility to, protected open space is a critical
requirement in the present and future development of urban agriculture in the AMA, it is the
third research objective to undertake a policy analysis of land-use initiatives in the AMA to
explore the extent to which these present an opportunity or constraint to urban cultivation in
Accra, as well as to examine how some land management issues hinder the sector’s ability
to play an effective role in household economic sustenance and urban management in
Accra.

The assessment of urban agriculture in the household economy and urban
development in Accra constitutes the fourth objective of the research. This assessment will
be conducted within the context of the role urban agriculture plays in terms of meeting the
food and nutritional requirements of urban households, reducing household food budgets
and expenditures, generating income for its practitioners and creating long-term
employment opportunities for the urban poor. The outcome of this assessment, along with
other information, will enable me to ascertain whether urban agriculture is just a transitory
attempt to combat food shortages, or a viable long-term initiative on the part of the urban
dwellers to alleviate poverty and enhance their standard of living.

Urban gardeners are likely to be confronted with a complex problem of input
constraints, especially in relation to access to credit facilities, markets, market information,
and extension services. This problem is even more serious because, in response to lack of
vacant space in the inner city for urban cultivation, most urban gardeners are resorting to
capital intensive cultivation⁵, a production method which requires more financial resources to acquire inputs like hybrid seeds, nursing and transplanting materials, organic manure, watering cans and tubes, and hand forks. Consequently, it is the fifth objective of the research to assess the input and institutional constraints undermining urban farming in Accra which have prevented the beneficial development of urban cultivation from occurring in an efficient and sustainable manner. Finally, based on the analysis of inputs and institutional constraints to urban farming in Accra, the research aims at assessing the policy implications of urban cultivation by outlining policy initiatives to encourage and support urban cultivation through policy formulation, land-use planning, institutional regulation and infrastructural development.

1.3 RESEARCH PROPOSITIONS

To pursue the above stated objectives, I formulated a number of hypotheses or propositions to guide me in the analysis. These are grouped under four main sub-headings: one, the spatial analysis of the location and operation of urban agriculture in the AMA; two, the assessment of urban agriculture in the household economy of urban gardeners; three, the assessment of the input and institutional constraints to urban cultivation in Accra; and finally, the examination of urban cultivation as a long-term initiative.

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⁵ Capital intensive used in this sense refers to the use of more liquid capital (cash), not machinery capital, to acquire farm inputs. This method does not displace labor, rather absorbs more labor as some farm operations could not have been performed by labor without money to buy inputs.
1.3.1 Spatial Analysis of Urban Agriculture in Accra

According to Bryant and Johnston (1992), urban agriculture is by no means uniform in its character. Its characteristics may differ from one place to another within the city and the area surrounding it. This diversity takes place primarily because the impacts of urbanisation on agriculture vary depending on the distance to the urban core area. It is therefore my hypothesis that food cultivation located within Accra (inner city) differs in scope and operation from those located along the city’s periphery. It is also my hypothesis that these differences are attributed to the differences in the intensity, progress and configuration of the urbanisation process between these two zones - inner city and outer city. Thus, I propose that there are significant differences in the development, operation and management of urban gardens located within the AMA (inner city) from those located along the urban fringes (outer city) on the basis of gender, production mix, method of production, purpose of cultivation and land tenure arrangement as the varying distance of urban gardens to the city core will more than likely produce divergent reactions to urban farming. Thus, such diverse reactions could influence how land is made available for farming, what is produced, why it is produced, where it is produced, how it is produced, when it is produced and who produces it.

1.3.2 Assessment of the Contribution of Urban Agriculture to the Household Economy

Urban agriculture plays a crucial role in the economic livelihood of the urban households in the AMA. I hypothesise that the purpose or benefit of urban cultivation varies on the basis of income and gender of the urban gardener and the type of land tenure he/she practices. I propose that for the low-income group, the purpose of urban cultivation is to meet household food requirements and generate income; for the middle-income group the purpose is to reduce household expenditure and enhance savings and; for the high-
income group, the purpose is to generate business profit. The difference in the purpose of cultivation reflects Maslow's hierarchy of needs. Also, I propose that urban cultivation is more likely to be beneficial to low-income gardeners than high-income gardeners based on the following hypotheses; one, the lower the income of an urban gardener the greater the proportion of its household income spent on food; two, the lower the income of a gardener the more dependent is the household on produce from his/her garden; and three, the lower the household income of a gardener, the higher is the proportion of the gardener's income that is derived from the sale of his/her garden produce to his/her total income. On the basis of gender, I propose that the purpose of urban cultivation in Accra differs, as proportionally more female gardeners are likely to cultivate for subsistence reasons while their male counterparts are more likely to cultivate for commercial reasons. This is because women are expected to be managers of sustenance (Chowdhury and Furedy, 1994); hence, they are more concerned with the nutritional needs of their households.

1.3.3 Assessment of the Constraints to Urban Agriculture

In respect to the constraints to urban agriculture, the following are the research propositions; one, the present land-use pattern, which is characterised by haphazard development, lack of zoning enforcement, illegal encroachment and land litigation, hinders the development and the promotion of urban agriculture in Accra, especially as it relates to access to, and security of, urban land for farming; two, the limit imposed by input constraints such as poor access to production capital, irrigation facilities, improved seeds/seedlings, organic manure, agro-chemicals and farm implements has inhibited gardeners from adopting an intensive method of food production in Accra; three, based on the review of sanitation regulations by-laws, metropolitan enforcement and media propaganda, local government policy towards urban farming in Accra can be described as discouraging; and,
finally, the potential health and environmental risks associated with urban farming in Accra are not inherent but emerge as a result of inappropriate practices, lack of official recognition, and lack of regulation to monitor urban cultivation.

1.3.4 Assessment of Urban Agriculture as a Long-term Initiative.

It is my proposition that urban agriculture is part of a long-term initiative by its practitioners to combat the problem of food accessibility and lack of employment in the metropolis. This proposition is based on the following hypotheses which will be tested for their validity; one, urban gardeners in the AMA are predominantly not recent immigrants but individuals who have resided in the metropolis for a long period and are well established in Accra; two, urban gardeners have been involved in urban cultivation for a long period (at least 10 years) which provides an indication of their continued satisfaction with the activity and their intention of practising it as a long-term venture; three, urban gardeners in the AMA come from diverse backgrounds which cut across broad income, educational and occupational groups, indicating that urban agriculture is neither a marginal activity nor is the interest likely to fade with rising socio-economic status; four, even if offered jobs for which remuneration is equivalent to the earnings from urban gardening, most gardeners would continue to undertake urban cultivation and this indicates low horizontal mobility of labour associated with urban gardening in the AMA⁶; five, urban gardeners are likely to expand their level of cultivation if the problems of input and institutional constraints are effectively resolved; six, urban cultivation often does not obstruct more appropriate land development.

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⁶ This is based on my perception that for most practitioners, urban farming is a life-long activity which could be practiced without being faced with a problem of lay-off. Hence, this reduces the desire of urban gardeners to seek employment in the formal sector, which is characterized by workers' lay-off.
but in most cases puts to use lands which are devoid of any physical developments such as transmission lines, along roadsides, and along water streams; and seven, urban farming is sustained and supported by a wide range of urban niches and its practitioners adopt varying production methods suitable for each niche, hence enhancing its chances of surviving metropolitan pressures.

1.4. **RESEARCH METHODOLOGY**

To pursue the objectives of the research, three methodological approaches were employed. One, a review of primary documents obtained from some metropolitan departments in the AMA; two, a series of unstructured interviews with policy makers, planning authorities and extension officers on various issues relating to urban agriculture in the AMA; and three, a structured interview of randomly selected 60 households practising urban agriculture in the AMA. Overall, these approaches draw on the views and perceptions of both urban gardeners and urban managers on issues of substantive concern to the objectives of this research.

1.4.1 **Review of Primary Documents**

The research accessed and analysed a number of primary documents which provided critical insights into the planning and management issues relevant to farming in the AMA. A bibliographic database called "Historical Data on the Environment (HIDEN)" was accessed from the office of the Environmental Protection Council of Ghana (EPC) to derive information on the location of government documents and research information relevant to the research. HIDEN is a computerised documentation and an integrated set of information system (CDS/ISIS) software, developed as part of the Ghana Environmental Resource
Management Project (GERMP) to provide reference to critical research information on resource management in Ghana.

Three sources of historical documents were critically reviewed to provide a historical perspective on the development and urbanisation processes in the AMA. These are, one, the population census reports of 1948, 1960 and 1984 acquired from the offices of the Population Impact Project in Ghana; two, a report on the social survey of Accra by the West African Institute of Social and Economic Research, and; three, historical maps and documents of Accra from the National Archives of Ghana. The study also relied on documents and magazines from the Ministry of Food and Agriculture (MOFA) as well as newspaper reports on urban food security in Accra to construct a historical snapshots of the development of urban agriculture in Accra. In addition, information derived from informal interviews granted by an official of the Department of Town and Country Planning and the Director of the Department of Parks and Gardens also provided critical insights into the historical development of agriculture in the AMA. Two of the respondents interviewed, Mr Adongo Mumuni and Mr Ibrahim Mohammed alias “Santana”, who have been engaged in urban farming, intermittently, over the past 38 and 44 years respectively, provided vivid information on events and actions that have influenced farming in the area, as well as how urban agriculture has evolved in response to the growing urban pressures and changing conditions. The farming experiences of these two respondents are long enough to reflect situations experienced both under the colonial and post-colonial era.

An assessment of past and present land-use policies for Accra was undertaken to unravel the various initiatives that have presented obstacles to the promotion of urban agriculture in Accra, and to ascertain the extent to which these obstacles have undermined the sustainability of urban agriculture in Accra. The assessment was made to ascertain the extent to which the various land-use initiatives have addressed the sustainability objectives
of making urban land accessible for urban cultivation by the urban poor, enabling gardeners to derive optimum yield and income from their farming undertakings, presenting opportunities for farmers in the AMA to recycle organic wastes, and enhancing gardeners' access to facilities relevant for the promotion of urban farming in the AMA. This assessment was made possible by the review of three land-use planning documents - the Town and Country Planning Ordinance (CAP 84), Land-use Planning Committee Report and the Strategic Action Plan for Accra - which were obtained from the offices of the Town and Country Planning Department and the World Bank's Urban II Project, both in Accra.

The Town and County Planning Department is responsible for initiating, formulating, and implementing land-use policies in Accra. The Department's planning document contains comprehensive and detailed information on policy, regulations and laws governing the use of urban space in the AMA. I relied primarily on the above-mentioned documents to assess the implications, especially the enforcement, of existing land-use initiatives on urban farming in Accra. Three proposed alternative concepts for the future development of the AMA - urban consolidation, multi-city structure and twin city structure - which are currently being considered under the strategic action plan for the AMA, were also examined to assess their likely impacts on the future development of urban agriculture in the AMA. Documents from other metropolitan departments which relate to the substantive concerns of the research were also relied upon to aid this assessment. Finally, to assess the nature of local government response to urban cultivation in Accra, I reviewed the 1995 metropolitan by-laws of the AMA and some sanitation regulations which have significant bearing on food farming, distribution, marketing and consumption in the AMA. The purpose of the review is to assess the extent to which such by-laws and regulations are prohibitive, restrictive or accommodative to urban cultivation as well as to critically evaluate the scientific and the logical bases for the formulation of such policy.
1.4.2 Unstructured Interviews

A number of unstructured interviews were conducted to elicit information needed to validate some of the research propositions. I met with a group of front-line staff of the Greater Accra Regional Extension Services of the Ministry of Food and Agriculture at their bi-annual regional meeting at Dodowa. The meeting with the front-line staff became possible after permission was sought from, and granted by, the Regional Extension Officer. The focus of the discussion was to derive information on the problems facing farmers in Accra. As a result of their regular and direct contacts with the farmers in the district, the front-line staff were able to provide a vivid picture of the nature of the problems facing the farmers during pre-production, production and post-production of food crops in the Accra district. They also provided suggestions as to how some of these problems could be addressed.

To examine the influence of land value on urban cultivation in the AMA, written and oral information were derived from the offices of the Ministry of Works and Housing, Land Valuation Board, Ministry of Food and Agriculture (Extension Services), Ghana Real Estate Developers Association and the Regimanuel Real Estate Agency. In addition, a detailed interview was carried out with selected gardeners who were cultivating rented plots to explore the extent to which changes in the cost of urban land have influenced their gardening activities, and the various responses they have adapted to accommodate such changes. Open format interviews were also granted by the Planning Officer of the Town and Country Planning Department, the Public Relations Officer of the AMA and the Public Health Officer of the Public Health Department to explore their opinions and concerns about the practice of farming in the city, and their responses towards a future policy to support farming in the metropolis. Institutional response to urban agriculture was assessed from these interviews, and this provided critical insight to the
nature of the official position on urban agriculture in the AMA. Based on the review of
scientific literature, these official concerns were critically examined to assess the validity of
their claims and concerns especially as relate to health risk, food contamination, traffic
congestion, aesthetic depreciation and environmental pollution, among others.

A trip to urban farms in diverse locations was undertaken with logistical support
provided by the Accra District Extension Service of the Ministry of Food and Agriculture (see
Plate 1.1). Four locations were visited - two in the inner city (Kaneshie and Abossey Okai)
and the other two in the outer city (Madina and Shiashie). The tour, which was led by Ms
Grace Andah of the Accra District Extension Services, took place early morning after a mid-
night rainfall, a condition appropriate to meet a large number of gardeners taking advantage
of the moisture present in the soil to work on their gardens. The purpose of the trip was to
undertake a reconnaissance survey of selected sites of urban gardens within the AMA, and
to explore the various farming methods being practised. I also had the opportunity to
interact with a group of gardeners working on their gardens in Kaneshie who had extensive
knowledge about farming in the AMA, and who were able to provide valuable information on
the development and growth of farming in the AMA. (see Plate 1.2). During the forum
discussion, five farmers, who attended a seminar on book-keeping and farm management
organised by the Operation Division of the Ministry of Food and Agriculture, provided
accounting records of their respective farm operations for the year 1994. This information
was found very useful in providing critical insight into the profitability and the economic
viability of urban gardening in the AMA. Photographs were taken of some of the gardens for
a pictorial presentation of their respective locations and crops under cultivation, as well as
other issues which were relevant to the research objectives.
Plate 1-1  The author and Ms Grace Andah, the Accra District Extension Officer, during a trip to some locations of urban gardens in Accra. The utility vehicle was provided by the MOFA to assist in the research.

Plate 1-2  The author and some community gardeners in Kaneshie.
1.4.3 **Structured Survey of Urban Farmers**

To explore the dynamics of urban agriculture in Accra, and particularly, to assess the contribution of urban agriculture to the household livelihood, as well as to examine the scope of the problems facing the sector, a structured survey of randomly selected urban gardeners was conducted to elicit their views on the above issues. The survey was conducted for a period of four and a half months, beginning in February and ending in June 1996.

1.4.3.1 **Defining the Problem**

The purpose of the survey was to investigate the contribution of urban agriculture to the household economy of the urban gardeners in the AMA, and to explore obstacles hampering the effectiveness of urban agriculture in urban development. In addition, the survey explored the perception of the respondents regarding the institutional response to urban agriculture in the AMA, and assessed the potential of urban cultivation as a long-term initiative in Accra.

1.4.3.2 **Defining the Target Population**

The target population interviewed were individuals who are involved in the production of food or vegetables within the administrative jurisdiction of the Accra Metropolitan Authority (AMA).

1.4.3.3 **Sampling Frame**

Like most cities in Africa, Accra has no list of residents or any form of city directory. This always presents a problem to urban researchers who try to draw samples from urban households for interview. However, in respect to this research, a list of farmers prepared by some front-line staff of the Accra office of the Extension
Services of the Ministry of Food and Agriculture was relied upon to identify and locate potential individuals to be interviewed. The list was originally compiled by the Ministry of Food and Agriculture to identify and locate gardeners within the Accra District who might require technical assistance from the extension service. This list was, however, supplemented by an additional one compiled during the field reconnaissance survey.

1.4.3.4 Statistical Unit of Analysis

The research used urban gardens, and in some cases the gardener's household, as a statistical unit of analysis. That is, the study relied on statistical data collected at the farm level for the research analysis. The process began with the identification and the preparation of a list of urban gardeners of which 60 were randomly sampled for the questionnaire interview. Thus, for each of the garden units sampled, an individual (a gardener) was selected as the respondent or the interpretational unit of analysis. Where there were two or more individuals from the same household involved in the cultivation of the same piece of land, only one of them was considered for the interview, which in most cases was the one most involved in the actual farming activity.

1.4.3.5 Sampling Design

It is the view of this study that the location of an urban garden significantly influences a gardener's perception on the benefits, problems and the operation of the garden. Since it is one of the study's objective to analyze the above issues, a stratified sampling technique was employed. With this method, I stratified the various urban gardens in the AMA into two distinctive zones based on their spatial location - one, the inner city gardens which referred to the gardens located within the built-up areas of
Accra, including the CBD and its immediate environs and, two, the outer city gardens which referred to the gardens located along the fringes or the periphery of the AMA. This delineation was aided by a map of Accra by Kufogbe (1988) which outlined the approximate limits of closely built-up areas and urban periphery of AMA (refer to Fig. 1.1).

Having stratified urban gardens on the basis of their spatial location, the next step involved the selection of administrative units that conform to each of the stratified sample zones and from where the questionnaire interviews were to be conducted. The administrative units selected to represent the inner city gardens were Kaneshie and Abossey Okai, while for the outer city gardens, the administrative areas selected were Madina and Shiashie (Fig. 1.2). Kaneshie and Abossey Okai were chosen because they are typical inner city communities where competition for land for commercial, administrative, industrial, recreation and agricultural uses is very keen. Madina and Shiashie are typical outer city communities with a vast expanse of vacant land which are being encroached upon by new physical developments. Thus, the stratified sampling technique provides a firm basis for the extrapolation of the sample survey results to the whole of the Accra Metropolitan Area.
FIG. 1.1 The Delineation of the "Inner City" and "Outer City" in the Accra Metropolitan Area (AMA)

Source: Kufogbe, S.K. 1995
FIG 1.2 A MAP OF ACCRA SHOWING THE SAMPLE AREAS.

LEGEND
1 James Town
2 Ussher Town
3 Adabraka
4 Korle Gono
5 Mamprobi
6 Sabon Zongo
7 Abossey Okai
8 Kanshie
9 Kokomlemle
10 New Town
11 Nima
12 Cantoments
13 Osu
14 Labadi
15 Teshie
16 Nungua
17 North & West
17 Outskirts
18 Madina
19 Tema
20 Tema New Town
21 Ashiman
22 North Kanshie
22 Ring Road Ind. Area

Sample areas

0 1 2 3 km
1.4.3.6 Sample Size

According to the 1984 Population Census report, 825 residents\(^7\) in the four sample areas were involved in urban agriculture in Accra. Sixty (60) of these farmers were selected for the questionnaire interview - this represent about 7% of the number of residents involved in urban agriculture in 1984. Since it is the objective of the research to provide a comparison of respondents' perception on some issues relating to urban gardening in Accra, a variable sampling fraction was employed. With this method, the total number of 60 urban gardeners interviewed was equally divided between the two stratified categories; that is, 30 each for the intra-urban area (inner city) and the peri-urban area (outer city). The sample consists of 57% male and 43% female gardeners\(^8\). On the basis of income, the sample is made up of 57% low-income residents (54,000 cedis or less per month), 32% middle income residents (54,001-96,000 cedis per month) and 11% of high income residents (over 96,000 per month). This is quite representative of the overall population of Accra\(^9\). More than three-quarters of the gardeners interviewed are between the ages of 35 and 64\(^{10}\). The choice of the sample size is influenced, pragmatically, by factors such as the estimated budget allocation for the research, time constraints and the level of breakdown of analysis to be done. The guiding principle for the choice of the sample size was to make sure the

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\(^7\) This consists of 30 residents in Abosey Okai, 24 in Kaneshie, 631 in Madina and 140 in Shiashie. This number also includes residents involved in urban husbandry.

\(^8\) According to the 1984 Population Census (the last census in Ghana), Accra is made up of 49% male and 51% female. It is likely that this proportion may change if the census is updated. Although on the basis of gender, the sample size is not representative of the population, this difference is not statistical significant.

\(^9\) Based on 1984 census, the population of Accra consists of 53% low income residents, 37% of middle income residents and 10% high income residents.

\(^{10}\) This is based on author's observation, as most gardeners are very reluctant to provide their age. The 1984 census had 19% of the population in that age category. Most of the urban cultivators are older, as the younger people are interested in securing jobs in the formal, "modern" sectors. The youth feel that urban cultivation belongs to the retiree and the aged.
size was big enough to reflect the variance of the population and at the same time small enough to be manageable within the limits of time and financial cost.

1.4.3.7 Survey Techniques.

A questionnaire interview constituted the technique used to investigate the problems posed in the survey. To standardize and facilitate the process of this interview, a questionnaire with a fixed set of questions and responses was prepared and used for the interview. Respondents did not fill in their own questionnaire because some of the respondents could not read or write well the English language, the language used in the questionnaire. Rather, the respondents were interviewed, by myself or the research assistants, in a local dialect of their choice - Ga, Twi, Ewe or pidgin English. Although this method was relatively more expensive and time-consuming as compared with the self-enumeration method, it was chosen to avoid a high level of non-response and inappropriately filled-in responses which could possibly come about as a result of the technical interpretation of some of the questions. The questionnaire with coded answers was designed in a way that the data obtained can statistically be analyzed with SPSS software and inferences made from them. The questionnaire was given to the Extension Service Department of the Ministry of Food and Agriculture (MOFA), who sought some clarification on some questions. The MOFA expressed an interest in the research because, except for the compiled list of some urban farmers in the Accra District, the Ministry lacks information about urban farming in the AMA and also has very limited research support for the sector.

Before the questionnaire was administered in the field, I organized a five-hour orientation session for the two research assistants (front-line staff of the Extension Service), who were to assist with the administering of the questionnaire, on the survey
goals, objectives and the technical interpretation of the various questions. The questionnaire was divided into five sections. Section one explored the characteristics of the urban gardeners in terms of their gender, education, place of birth, duration of stay in Accra, household size, employment status, and the level of income. Section two gathered information on characteristics of the urban gardens with respect to the type of crops grown, their location, size of land under cultivation and the type of land tenure practiced. Section three investigated the extent to which urban agriculture contributes to household’s basic subsistence, diet supplement, cash income and fungible income (money saved due to home-production of food). This section also obtained information from urban gardeners regarding the availability and sources of their garden inputs. The final section of the questionnaire investigated the major problems confronting urban farmers especially in regard to access to land, market, institutional support, credit and technology. Before its actual use in the field, the prepared questionnaire was pre-tested on four households. After the pretest, some modifications were made to the original questionnaire such as re-ordering the questions, as well as some linguistic adjustments made to some questions and answer choices.

1.5 ETHICAL CONSIDERATIONS

The interview of the urban farmers was conducted only with their free and informed consent. The potential interviewees were given both an oral explanation and a document containing descriptions of the purpose, design and procedures of the research. That is, each interviewee was given a consent form which indicated the general purposes of the study, procedures involved, the benefits of the research, the potential beneficiaries of the research, provision for confidentiality and an expression of invitation to participate. The privacy of the interviewees was not invaded or disclosed
but was protected at all times. Furthermore, information obtained from the interviewees was treated as confidential, and reasonable efforts were made to prevent its falling into unauthorized hands. Data collected from the offices of the metropolitan departments, where necessary, were kept secured from interception. Reasonable efforts were also made to ensure that the researchers did not pursue any action which might pose a risk to those interviewed. The researchers also displayed sensitivity to, and respect for, the cultural values of the people under study. Permission to undertake the unstructured interviews of public officials was sought from appropriate government authorities. While in Ghana for the field work, I was affiliated with the Department of Geography and Resource Development of the University of Ghana. The department assisted in the field work with some logistical support such as library information, cartographic drawings and some secretarial work. In addition, the host department facilitated contacts with the appropriate metropolitan departments on the acquisition of primary data and information.

1.6 ORGANIZATION OF THE RESEARCH

The study is organized into eight chapters. In chapter one, background information on the various issues to be addressed in the research has been presented. In this chapter, I detail the research objectives, research propositions and the survey methods employed in the field work. In chapter two, I review existing literature on topical issues which relate to urban agriculture. These topical issues include urbanization, the informal sector, poverty, the urban food system and the theoretical context of urban agriculture. In chapter three, I explore and analyze the historical development of urban agriculture in Ghana from the colonial era to the present. Various
events and factors that shaped the evolution of urban agriculture in Accra are identified and examined.

In chapter four, I explore the extent to which some land management issues such as land use acts, land tenure, land value and land conflicts have affected the ability of urban gardeners to access urban land for farming in the AMA. The chapter also examines how each of the three proposed alternative concepts for the future development of the Accra - urban consolidation, multi-city structure and twin city structure - will likely impact on the future development of urban agriculture in Accra. In chapter five, I examine the spatial implications of urban farming by assessing whether there are significant differences in the operations, purpose, benefits and management of urban farming practiced in the inner city vis-à-vis the outer city. The analysis of the benefits of urban agriculture to the household economy of the practitioners with respect to household food supply, income generation, employment opportunities and enterprise development, is the focus of chapter six. In chapter seven, an assessment is made with regard to the various problems and concerns associated with urban agriculture, as well as the logistical constraints to urban agriculture in Accra. In the final chapter, an assessment is made to ascertain whether urban farming is mostly practiced as a temporary measure to alleviate the problem of food shortages in Accra or is evidence of a more fundamental trend in the restructuring and re-orientation of the urban landscape to meet changing urban priorities and a growing urban demand. The chapter concludes with a policy recommendation as to how to address some of the tangible concerns of urban agriculture and to promote the sector through policy formulation, land-use planning, institutional regulation, and infrastructural development.
This chapter examines the concept of sustainable urban development, as a framework for analysing the role of urban agriculture in Accra. It also reviews literature on topical issues which have bearings on the development of urban agriculture, such as urbanisation processes, urban unemployment, urban poverty and the informal sector in Africa. Case studies of the development of urban agriculture in some selected cities are also reviewed for comparison.

2.1 CONCEPTUAL FRAMEWORK

This section addresses the conceptual framework upon which this study was based. To begin, a background study of the concepts of sustainable development and urban sustainability was explored by reviewing existing literature on these concepts. Based on this review, a framework for integrating urban agriculture into sustainable urban development in Accra was developed.

2.1.1 The Concept of Sustainable Urban Development: A Background Study

The concept of sustainable development has assumed much momentum as an acceptable development paradigm in recent times. The Brundtland Commission, which coined the term, defines it as the development that meets the needs of the present generation without hampering the ability of future generations to meet their own needs (WCED, 1987). Providing a simplistic but quantitative definition of sustainable development, Pezzey (1989) espouses a different definition of the concept within the context of a mathematical model, which differentiates between measures of development based on output, consumption and utility. He stipulates that sustainable development
might require that welfare is above some minimum level and that growth is ecologically sustainable; that utility is non-declining and consumption is greater than the minimum necessary to satisfy basic needs and below a maximum which defines the limits of ecological sustainability. Even though "sustainable development" seems to have emerged as the development paradigm of the 1990s, a great deal of vagueness still surrounds the meaning, definition and theoretical underpinning of the concept. MacIaren (1992) suggests that the WCED definition is deliberately vague because the Brundtland Commission needs to arrive at a definition that would be acceptable by all WCED's members. For instance, the concept gives no indications of the time horizon regarding its reference to "future generations", the scope and substance of human needs, and the role of the environment. Other authors such as Elkin and McClaren (1991) argue that sustainable development fails to consider the issue of equity, while Niu et al. (1993) insist that the concept fails to emphasis the spatial dimension of development.

There is also considerable debate within the literature regarding sustainable development and economic growth. The debate broadly divides between those who believe the two are compatible and those who do not. The geographical focus of the authors seems to influence their position on this pertinent issue. Thus, those who focus on the North tend to stress the limits to growth, while those who focus on the South tend to stress the need for growth. Rejecting this dichotomy, the WCED (1987) emphasised the compatibility between economic growth and sustainable development, and urged for economic growth and stressed that environmental considerations need not be in conflict with this. Similarly, the World Conservation Strategy (IUCN, 1980) argues that development and conservation are not incompatible and that poverty leads to environmental degradation, and growth is possible with environmental protection.
In spite of the growing interest in the issue of sustainable development as an emerging development paradigm, there has been little analysis of its applications to urban development. For instance, Aina et. al (1994) and Miltin (1992) noted that "although the concept has become very popular in current environment and development debates, it has surprisingly not been applied much to urban systems". In this vein, Maclaren (1992) observed that "in the absence of such research, municipalities attempting to resolve pressure in the urban environment are lacking in guidance about what sustainable development initiatives are possible, what will work and what will not". There are a number of compelling reasons that necessitate a serious consideration in applying the concept of sustainability to urban development. For instance, cities and local governments are recognised as having a key role to play in achieving sustainability as highlighted by the Agenda 21 slogan "think globally, act locally". An analysis of Agenda 21, which was the major document signed by heads of states at UNCED, and which spelt out in 40 chapters how sustainable development should be achieved in the 21st century, reveals that over two-thirds of the actions will have to be taken at the local (urban) level. This is because of the projection that the growing urban population will soon exceed the rural population, and the fact that environmental impacts of the human species are more evident and more intense in the city. In addition, certain city governments have shown far more initiative than national governments in taking on their environmental challenge. The crucial role that urban governments can played towards urban sustainability is echoed in the Agenda 21 produced at the Rio Summit in 1992:

*Because so many of the problems and solutions being addressed by Agenda 21 have their roots in local activities, the participation and co-operation of local authorities will be the determining factor in fulfilling its objectives. Local authorities construct, operate and maintain economic, social, and environmental infrastructure, oversee planning processes, establish local policies and regulations.... As the level of governance closest to the people, they play a vital role in educating, mobilising and responding to the public to promote sustainable development.* (UNCED, 1992).
Recently, some authors have applied the concept of sustainability to urban development. For instance, Richardson (1992) defines sustainable urban development (SUD) as "the continuing maintenance, adaptation, renewal and development of a city's physical structure and systems and its economic base in such a way as to enable it to provide a satisfactory human environment with minimal demands on resources and minimal adverse effects on the environment". Assessing the implication of the sustainability concept to urban development, Dovers (1990) contends that the definition of sustainable development is inherently difficult at the conceptual level, but becomes more clearly defined as it is translated into policies and specific action at the local level. In this regard, Gardner and Roseland (1989) identify four substantive principles that should guide any sustainable initiatives at the local level - these are the satisfaction of human needs, the maintenance of ecological integrity, the achievement of equity and social justice, and the provision for social self-determination and cultural diversity. More comprehensive guiding principles were espoused by Elkin and McLaren (1991) which include the principle of futurity - which considers the effects of present activities on the ability of future generations to meet their needs and aspirations; the principle of the environment - which requires in any human activity, the full and true environmental cost of that activity must be taken into effect through regulations and market-based incentives; the principle of equity - which considers equality in resource use among current generations; and finally, the principle of participation - which takes into consideration the need for environmental and economic decision-making be democratic through effective participation in actual process of development. Reflecting somewhat on Gardner and Roseland (1989) and Elkin and McLaren's (1991) principles, Barbier (1987) and Maclaren (1996) define three goals of urban sustainability: environmental sustainability which concerns with the protection and the maintenance of conditions and capacities of the environment - genetic diversity, ecological functioning, resilient
and biological productivity - over time; economic sustainability which focuses on the satisfaction of basic needs and reduction of poverty by economic activities which have minimal impacts on the natural environment, and are efficient in their consumption of resources; and social sustainability which concerns with lasting and meaningful social relations and achievement of cultural diversity, institutional capacity building, social justice, social equity and participation. They contend that the general objectives of sustainable urban development is to maximise these three goals at least through trade-offs.

Daly (1989) identifies four principles to guide any initiatives to achieve urban sustainability. These principles include: first, the need to limit the human scale to a level which is at least within the earth's carrying capacity; secondly, technological progress for sustainable development should be efficiency-increasing rather than throughput increasing; thirdly, for renewable resources, harvesting rates should not exceed re-generation rates and waste emissions should not exceed the renewable assimilative capacity of the environment; and finally, non-renewable resources may be exploited, but only at a rate equal to the creation of renewable substitutes.

With regard to the policy implications of sustainable urban development, Crerar (1989) suggests a market-oriented initiative to urban sustainability by suggesting that encouraging an optimal allocation of resources through correct pricing constitutes an effective means to realising sustainable urban forms. Thus, Crerar places greater faith in the market in ensuring sustainable settlements as he stipulates that by recognising the true cost in the pricing of goods, urban regions would have a greater propensity to intensify to a more compact and efficient pattern of development, which would inevitably reduce their consumption of energy, material and land. He identifies advantages associated with compact urban form to include: reduction in urban land consumption leading to environmental preservation; reduction in capital and operating costs of
Infrastructure through energy savings associated with urban intensification, economies of scale associated with large scale utilisation of water pumping, police protection, public transit and waste disposal; and the reduction in travel demand leading to a reduction in energy demand and emissions. However, other authors have, similarly, marshalled strong arguments to dispute the claims of compact city theory. For instance, Webster et. al. (1985) indicate that the connection between public transit and higher densities is not straight-forward as mode of transport and land use policies seem capable of exerting only a relatively weak influence on the prevailing trends in urban structure and transportation choices. Their conclusion was based on their findings on the use of public transport in different OECD countries. Besides, Gordon and Wong (1985) assert that the argument that urban sprawl is environmentally costly generally assumes a monocentric model of urban development whereby travel distances increases as urban growth extends from the centre. They counteracted this model with a polycentric model which reveals that sprawl is only inefficient in cities with single centre. Explicit in their argument is the notion that in polycentric cities, sprawl may actually reduce trip length and congestion as well as fuel consumption. It is also the author's argument that reducing intensity of urban land use to accommodate urban cultivation to absorb urban wastes (urban sink) should be seen as sustainable initiative.
2.1.2 Urban Agriculture and the Urban Sustainability Initiative in Accra: A Framework of Analysis.

Although the literature that has emerged on sustainable urban development, as discussed above, is impressive, unfortunately most of it concerns the urban environmental issues facing the developed countries. They reflect the environmental concerns of the developed world where urban sustainability is perceived more in terms of ecological sustainability and maintenance of ecological integrity. This is because the MDCs level of resource use has a tremendous impact on the sustainability of their ecological resources as their gluttonous consumption has characterised their use of resource stock. Thus, urban affluence is the contributing factor to urban unsustainability in MDCs. Hence, urban sustainability in MDCs cities is conceptualised as achieving ecological sustainability aimed at attaining sustainable patterns of resource use, service provision and ecosystem exploitation. Thus, the concern of urban planning and management in the developed countries (MDCs) is focused on the deterioration of the natural systems and the global commons.

Whereas, in MDCs, urban affluence is the contributing factor to urban unsustainability, in the developing countries (LDCs), urban poverty is the key to deteriorating urban conditions. Thus, while the urban affluence in the MDCs is unsustainable, we need to know that urban poverty in LDCs is also unsustainable. Urban poverty in the developing countries pushes the poor to discount the ecological future of urban resources and reduces the potential of the urban poor to access basic environmental services and employ efficient technology to manage their urban environment (Hardoy, Mitlin and Satterthwaite, 1992). Poverty also places the urban poor in a precarious condition where they are compelled to settle in environmentally risky areas which they can afford. Hence, to achieve urban sustainability in cities in LDCs, such as Accra, would require approaches and strategies which are conceptually different from those of the MDCs, and which are poverty-
focused and aimed at promoting economic sustainability to achieve a secure livelihood for the urban population. Thus, urban planning in Accra needs to emphasise strategies to promote economic survival in respect to access to basic human needs such as food, employment, health, housing and water supply alongside promoting initiatives to solve the city's environmental problems.

However, it should be noted that the sustainability of cities in the LDCs is not a question of raising the living standards of the poor to middle-class levels of consumption, which itself threatens sustainability, but that of ensuring access to basic needs and prioritising urban development and management issues in the direction of providing the most basic needs for the poor. Thus, access of the majority of the city dwellers to basic human needs and sustainable livelihoods should be the highest priorities that must be addressed in any concern with sustainable development and the well-being of urban dwellers in Accra.

Promoting urban informal sector activities such as urban farming, should form an essential part of any effort to enhance the economic livelihood of the urban poor and to promote environmental management in Accra. Specific initiatives need to be implemented to promote the sector and enhance the economic livelihood of the urban poor. These initiatives should include providing physical space, infrastructure and credit facilities for the operation of urban farming, enhancing markets, promoting farmers' participation in urban decision-making, protecting the urban farmers under labour laws, and promoting linkages between urban agriculture and other sectors of the economy. Thus, employment generation should constitute the main focus of any strategy towards urban sustainability in Accra. In metropolitan Accra, any attempt to pursue an environmental strategy without an income generation component to increase access of the urban poor to food, water supply, shelter and health will definitely fail to achieve urban sustainability.
Furthermore, any attempt to reduce environmental degradation will be counter-productive if there is a failure to respect the needs and encourage the participation of the urban poor.

Another practical step towards eradicating urban poverty and achieving urban sustainability in Accra is in respect to equitable distribution of resources. Reforming existing socio-economic regimes that constrain the urban poor from gaining access to resources needs should also be the cornerstone of any sustainable urban development strategy. Thus, an essential focus of sustainability strategy in Accra should also be to distribute, effectively, scarce urban resources to the entire population.

Thus, sustainable urban development in the context of Accra should be directly concerned with increasing the material standard of living of the urban poor, which can be quantitatively measured in terms of increased access to food, income and services. It should also entail the objective of reducing absolute poverty by providing lasting and a secure livelihood that minimises resource depletion, environmental degradation, cultural disruption and social instability. This notion requires cities such as Accra to be seen as economic cities where production, exchange, and consumption can be geared towards wealth creation to avert urban poverty, and where wastes are processed and recycled to protect the environment and generate incomes for the urban poor. The two common themes of an economic city are income generation to enhance access to facilities, and resource efficiency to increase the welfare derived from each unit of the resources and to minimise the damage to ecological systems.

Accomplishing economic growth in Accra should not be at the expense of the environment. In the process of designing and implementing urban development programs, full consideration must be given to the optimum balance of ecological and economic goals. Hence, there is a growing need to initiate policies to reduce human impacts on the urban environment. Urban sustainability requires
that people should relate more closely to nature, both by protection of the surviving vestiges of the natural world, and by the creation of completely new opportunities for flora and fauna to flourish in an urban setting (Mayur, 1990). This conceptual notion defines the essence of an ecological city - which is a natural response to the unliveable, ecologically ruined and exploitative urban centre being created today. Such an ecological city is described as self-sustaining where material and biological constituents are well-balanced and integrated, as a recycling city in which waste is a resource for utilitarian purposes, as a conserving city which is based on the minimal needs principle to eliminate or reduce waste, as a healthy city with minimal or no pollution, and as a city where the relationship among all its elements are supportive, co-operative and not exploitative (Mayur, 1990).

To develop strategies that promote the integration of the economic livelihood of the urban poor and environmental sustainability in Accra requires an understanding of the city’s metabolic processes. This requires viewing Accra as an ecosystem. One fundamental step towards understanding the characteristics of Accra with regard to the flow of materials and energy is to introduce a geochemical method of thinking so that Accra is treated as a material system, whose input, output, transfer and change of every type of material and energy are important subjects of study. The metabolism of Accra can be enhanced through the use of recycling wastes and by closing the loops between the users of raw materials and producers of residues. This implies that, as the earth’s ecological system is seen as a closed system, the conventional, linear way of production-consumption-disposal should give way to a cyclical one which closes this open loop in our thinking. Thus, the treatment and management of Accra as an ecosystem suggests an interpretation that stresses the importance of transforming the unidirectional flow of resources from farm to garbage into a circular flow of waste recycling. The understanding of the urban metabolism through an ecosystem approach is significant in that it provides the potential to initiate an integrated
approach to solving a wide variety of urban problems concurrently. Ecosystem theory is helpful in discovering key relationships among food and other urban systems, as well as identifying principal stresses in the city's food system. For a clear identification and understanding of change, restructuring and transformation in a system like that of the urban food system, one needs to trace the historical development of the food system to identify important actions, critical variables, processes and thresholds of change which lead to instabilities in the urban food system - production, distribution, marketing and consumption. Thus, the concept of sustainable urban development provides the framework upon which to assess urban agriculture and integrate it into urban development through land-use planning, institutional policy and infrastructural development in Accra.

2.2 LITERATURE REVIEW

Some significant consequences of the rapid rate of urbanisation experienced in cities in developing countries have been the rise of urban unemployment and the surge of urban poverty. In Africa, urban agriculture has emerged as an adaptive response to these growing problems. The link between urban poverty and urban agriculture is quite evident in the literature on urban development; hence, it is the purpose of this section to review the relationship between urbanisation, urban unemployment, urban poverty and the rise of urban agriculture.

The rapid rate of urbanisation in Africa has brought with it a scenario whereby urban population is expanding faster than the urban economy, and much faster than employment opportunities. Since the 1974, employment growth rate of 3% in Africa has lagged behind the urban population growth rate of 4%, and, today, this has led to a 10-35% unemployment rate in Africa (Becker et. al. 1994). Massive rural-urban migration has accounted for the expansion of the urban population in most African countries, and this explains the cause of rising urban unemployment. Exploring the cause of the migration, Todaro (1969) argued that the decision to migrate from rural-to-urban areas is fundamentally related to the urban-rural real income differential, and the probability of obtaining urban jobs. However, Jamal and Weeks (1988) questioned this argument by Todaro by suggesting that, in the past, income differential might be the cause of rural-urban migration, but relying on similar explanation to account for the contemporary migration in Africa is disputable. Their reason was that the share of GDP generated by urban economic activities has been declining recently with the adoption of, in most countries, structural adjustment programs which have reduced wages and salaries in the urban civil service, reduced public sector employment, removed subsidies for publicly funded urban services, and devalued the national currency, which has led to an increase in the cost of urban consumer goods. According to Jamal and Weeks (1988), these outcomes have led to a reduction in real income in the cities, and hence almost closed the urban-rural income gap.

Similarly, Aziz (1981) also criticised Todaro's contention that surplus labour from the rural sectors would be gradually absorbed in the dynamic urban economy as industrialisation expands to take advantage of availability of cheap rural labour. According to Aziz, contrary to the predictions made by the model, rural labour would not get absorbed in the dynamic urban economy due to the
fact that the growth of wage employment opportunities in the formal urban sector has declined, and also industrialisation in most developing countries was not the labour-intensive type as was the case with the western industrialised world in the 19th century. Consequently, labour migration from rural to the urban areas has only added to the existing problems of urban unemployment and poverty. But the question worth asking is: why, in spite of a low probability of the rural migrants getting employed in the urban formal sector, do people continue to migrate from the rural to the urban areas? An answer to this question was offered by Aziz (1981), who argued that rural migrants are still attracted to the urban centres in spite of the low probability of finding jobs because of the prospect of eventually engaging in a high-earnings informal activity and the belief that the lifetime income of an urban worker may be higher than that of a rural resident fully employed throughout his working life.

Implicit in Aziz's argument is a notion expressed by Samal (1990) that economic development based on the formal sector has failed to generate adequate and equitable employment and income opportunities. As a result, the surplus labour unable to get absorbed in the formal sector has been forced to find its own sources of employment and livelihood in a variety of productive informal activities in urban centres. Thus, Aziz (1981) suggested that the informal sector is labour-supply-oriented in the sense of having emerged in response to the migration of unskilled labourers who, unable to be absorbed into the formal economy, take up informal work. Morah (1987) and Papola (1980) expressed contrary views by stipulating that the informal sector originated in response to the growing demand for such services in the urban areas rather than in response to supply of labour.

The problem of urban unemployment has been of a great concern to most African governments. Unfortunately, there has not been any feasible and sustainable policy option that
exists to manage urban poverty in Africa. Neither Tanzania's strategy during the mid-1970's of eliminating unemployment by returning unemployed rural-urban migrants to their village of origin, nor bulldozing squatter settlements by the Kenyan government in 1990, is a feasible solution to the urban unemployment problem as such measures only removed, temporarily, evidence of desperate poverty from the cities but not the root cause (Stren, 1989). Some African countries have even explored other poverty management initiatives such as food subsidy and price control, and these have led to macro-economic havoc (Becker et al. 1992). Other measures such as the creation of more formal sector jobs have also failed to solve the problem as only a few African governments could afford to provide a sufficient number of such jobs to substantially reduce urban unemployment. Even a new job created may not reduce urban unemployment as Harris and Todaro (1970), Elkan (1970) and Gugler (1976) pointed out that any new formal job created in the city could attract migrants from the countryside in search of urban opportunities, and the number attracted might well exceed the number of new jobs created, thereby accentuating the problem of urban unemployment. This has led many observers to insist that creating more urban jobs in the formal sector will not solve the problem, but may only exacerbate it, and to argue that action to promote employment in the rural areas is at least equally important.

The inadequacies of past and present urban policies in addressing the problems of urban unemployment and urban poverty in Africa have necessitated the need for urban planners and policy makers in the region to explore and promote a new, dynamic urban initiative which effectively seeks to absorb excess urban labour and alleviates the problem of urban poverty in Africa. A significant number of urban researchers have pointed to the informal sector as a viable sector which could be harnessed to generate employment opportunities on a more sustainable level in the developing countries (Rabinovitch, 1992; Mazingira Institute, 1992; Mitullah, 1991; and Pachecho,
Rabinovitch (1992) presented a case for the informal sector when he outlined Curitiba's integrated transportation management initiative which provides an excellent model to show how the urban informal sector can help reduce the demand for transportation fuel and reduce emissions while at the same time providing a means of managing the city's wastes, as well as providing employment opportunities and environmental education to the urban community. Smit and Nasr (1992) also presented a case for how cities can be transformed from being only consumers of food and other agricultural products into important resource-conserving, health-improving, sustainable generators of these products through the promotion of informal sector activities such as urban agriculture.

There are many reasons why local authorities should not discourage the informal sector but encourage it as a viable option for employment generation and poverty alleviation in African cities. For instance, it was revealed in a survey that over 50% of the urban labour force in Africa is typically found in the informal sector in the region's capital cities (Becker et al., 1994). A similar survey conducted by Wilbar Smith Associates et al. (n.d.) also suggested that approximately 60% of the employment in Lagos can be classified as informal. For Abidjan, 55% of the labour force are informally employed (Henderson, 1988). For Bamako, about 68% of all workers are in the informal sector (Becker et al., 1994), while in Dakar the sector captures 56% of the total employment (World Bank, 1983). In Ghana, 60-70% of the labour force is found in the informal sector (Hart, 1973). In Nairobi, up to 44% of the labour force is employed in the small-scale, informal activities (House, 1981), while the proportion in Lusaka approaches 40% (Sandbrook, 1982). The consequential effects of the Structural Adjustment Programme have even provided additional impetus as to why policy makers should focus on the promotion of the urban informal sector as an urban initiative. As structural adjustment proceeds, the percentage of labour force employed in the formal sector
continues to decline, government subsidies to, and the protection of, the formal sector similarly diminish, and workers in the public and government institutions will continually be laid off through the redundancy and attrition policies of the SAP (Adewumi, 1994). Thus, according to the UNDP/World Bank (1992), by the end of the 1990s, only a small share of the new labour force entrants into the labour force will be able to rely on the formal sector for employment.

Assessing the advantages associated with the informal sector vis-à-vis the formal sector, Davies (1978) offered many convincing arguments. For instance, there is considerable freedom of entry into the informal sector, both for the employers and the employees. Furthermore, informal sector activities tend to be characterised both by their small scale and by their relative labour-intensity, as opposed to the much larger and relatively capital-intensive character of many formal activities. Davies (1978) also argued that the above features mean that the informal sector is more accessible than formal sector to the large number of urban population as they create more employment for a given amount investment, and it avoids the problem of foreign exchange associated with most capital intensive foreign-owned enterprises in the formal sector. Morah (1987) perceived the urban informal sector as playing the "trinity" role of providing urban employment, poverty alleviation, and improved environmental quality by respectively improving labour absorption capacity, generating human capital and income, and recycling urban wastes. Stren (1986) argued that the informal sector in Africa must be understood as "a spontaneous adaptation to the needs, productive structures and markets of a predominantly poor population, unable to gain access to the formal economy based on metropolitan technology". A growing body of evidence showed that the informal sector is equally productive in comparison to the formal sector (Samal, 1990; and Guisinger and Irfan, 1980), and even in some cases, the productivity and average earnings of informal sector workers are higher than those of unskilled workers in the formal sector (Waldorf and
Waldorf, 1983). From the above, it can be argued that both the accessibility of informal activities and their relatively labour-intensive nature make the sector more viable than the formal sector as a means of providing employment and income opportunities for the masses of the urban population in Africa. In a sense, the informal sector appears to have developed precisely because it caters for the basic needs in a way that the formal sector does not. It is therefore easy to assume that an expansion of the informal sector is the best way to meeting the basic needs of the urban poor.

But despite the proliferation of arguments attesting to the significance of the informal sector in developing economies, the sector has not received adequate recognition in the national development plans of African countries. It has been the primary goal of all developing countries to eradicate poverty; however, much of the current planning remains directed almost exclusively to the formal sector (Morah, 1987). For all the benefits associated with urban informal sector vis-à-vis any problem or doubt associated with the urban informal sector, it is arguable that positive encouragement should be given to the informal sector as a way of alleviating the unemployment problem facing every African city. Thus, it will be highly inappropriate to suppress or discourage the informal sector in Africa. To encourage the sector, it is necessary to begin with the formulation of development strategies which explicitly include investment incentives for the sector. Urban sector policies such as land-use controls and credit facilities, which do have constraining effects on the informal sector, need to be effectively reformed. Morah (1987) suggested that apart from a general policy of legal recognition to improve the attitude towards the informal sector, there is the need to emphasise specific policies such as the re-orientation of lending procedures, technological transfer, elimination of restrictions preventing fuller participation by the informal sector, and zoning measures which facilitate the clustering of homogeneous informal sector activities in given locations within the city. Freedman (1981) suggested three policies for strengthening the sector: one, enhancing the
sector's linkages with the agriculture sector, the formal sector and the foreign trade sector; two, equal treatment with the formal sector for those informal sector enterprises that have demonstrated their viability; and three, government purchases of informal sector goods through sub-contracting and/or direct sales.

While some authors have enumerated a number of positive contributions the informal sector can make to urban development, and have urged for its promotion, others such as Davies (1978) have critically questioned certain claims associated with the informal sector. According to Davies, that informal activities are relatively labour-intensive is not disputed, however, once one analyses the cause of this labour-intensity certain doubts emerge. According to Davies, it is not so much that informal enterprises freely choose labour intensive techniques, but rather they lack the means to acquire capital-intensive technology, hence any possible policy which improves access to credit to the sector would in fact destroy the labour-intensive nature of informal production. Thus, implicit in Davies' argument is the notion that it does not necessarily follow that an actively promoted informal sector would continue to be labour intensive, rather policy should be designed to promote the use of human labour whether by formal or informal enterprises rather than the promotion of the informal sector in toto. Davies also questioned the views that the informal sector exhibits a characteristic of freedom of entry, that is, lack of barriers to entry and easy access to the informal sector. He revealed that evidence points to numerous restrictions in the form of official policies, metropolitan by-laws, restrictive trade licensing and health and safety regulations - which undoubtedly reduce access to participation in informal activities. Drakakis-Smith (1992) also undertook a critical study of the urban informal sector and pointed out that the informal sector could not be exclusively associated with the urban poor since many of the informal occupations provided
incomes higher than those received in the lower-paid formal sector jobs. Hence, the emphasis on the urban informal sector would not necessarily benefit the targeted group - the urban poor.

In another related issue, Aziz (1981) made a provocative proposition that the urban informal sector in the developing countries is a temporary phenomenon subject to its vanishing the moment immigrants moved out of the sector to the formal sector. A similar view was expressed by Todaro who insisted that the urban informal sector is only a temporary phenomenon emerging as a cushioning effect to the enormous flow of rural labour in search of modern sector jobs, and that the sector will vanish or shrink the moment rural-urban migration is reversed or reduced. Mittar (1988) also perceived the emergence of the urban informal sector as a transitory problem and expected its gradual liquidation with the growth of the formal sector and technological advancement. However, while Aziz (1981), Todaro (1969) and Mittar (1988) perceived the urban informal sector as a temporary phenomenon, Morah (1987) opposed their views by asserting that the informal sector is a permanent feature in the urban economy of the developing countries which is attested by the growing percentage of the urban labour in the informal.

2.2.2 The Emergence of Urban Agriculture

The growing importance of the informal sector in urban economic development in terms of employment opportunities and income generation has encouraged some urban researchers to explore the extent to which urban agriculture can contribute effectively to the economic livelihood of the urban dwellers. For a long time urban farming has virtually been excluded from the definition of the informal sector in the literature on African cities (Mazingira Institute, 1992). However, most recent literature on the urban informal sector such as Stren (1989), Lee-Smith and Lamba (1991), Becker et al (1994), and Rabinovitch (1992) have made critical reference to urban agriculture as an
important informal sector activity as it shares a number of the elements of the informal economy - ease of entry due to low start-up capital; lack of official recognition in land use planning; reliance on indigenous resources; no imposition of tax; small scale, labour-intensive and adapted technology; lack of formal training; and, unregulated markets.

The term "urban agriculture" may appear to be an oxymoron as agriculture is considered to be a rural activity (UNDP, 1996). Thompson (1957) who preferred the use of the term market gardening, defined urban agriculture as that "branch of farming which has for its objective the production of vegetables for a local market". In her analysis of urban farming in Toronto, Eguillor (1993) defined urban agriculture as food grown within the urban structure of the city which includes vegetables and orchards. Whereas Thompson's definition falls short of mentioning the urban centre as the place where the actual production takes place, Eguillor's definition makes such a reference.

In Asia, Yeung (1986a and 1986b) defined urban agriculture as the production of food within the urban and peri-urban areas. Yeung's definition refers to the farming activities taking place not only within the built-up areas in the city (as did the previous authors) but also to include those taking place along the fringes of the city. Similarly, Sawio (1993) also defined urban agriculture as the growing of crops and keeping of livestock in both intra-urban open spaces and peri-urban areas. Sawio's definition extends previous definitions by including the rearing of animals as part of urban agricultural activity. Smit and Nasr (1992) brought additional perspectives to the definition of urban agriculture by referring to it as a "food and fuel grown within the daily rhythm of the city or town, produced directly for the market and frequently processed and marketed by the farmers or their close associates". Whereas their definition bring an additional element - the cultivation of urban fuel - Smit and Nasr did not include the production of food for direct household consumption. It was the UNDP who provided a more comprehensive definition of urban agriculture.
as "an industry that produces, processes and markets food and fuels, largely in response to the daily demand of consumers within a town, city or metropolis, on land and water dispersed throughout the urban and peri-urban areas, applying intensive production methods, using reusing natural resources and urban wastes, to yield a diversity of crops and livestock". The comprehensiveness of this definition stems from the fact that it makes reference to the locational context of urban agriculture in the city as well as the production methods and inputs usually used.

As to the various components of urban agriculture, Lee-Smith and Lamba (1991) and Smit and Nasr (1993) identified these to include the cultivation of crops, fruits and vegetables, forestry, parks, garden, orchards, animal husbandry, fuel wood plantations, and aquaculture. Due to financial constraints, the term urban agriculture is applied in this thesis in a restrictive sense to refer only to the production of crops and vegetables on land which is administratively zoned for urban uses within the built-up and the peri-urban areas of the Accra Metropolitan Area (AMA). However, the research makes occasional reference to poultry keeping and animal husbandry in establishing the relationship between crop production, livestock rearing and poultry production in the AMA.

2.2.3 Theoretical Underpinning of Urban Agriculture

The study of urban agriculture has raised many concerns regarding theory and policy in Africa. The upsurge of urban cultivation has generated responses from two dominant political economy theorists - the Modernisation and Marxist schools of thought. The Modernisation school views urban agriculture as a "manifestation of ruralization of cities" which is predominately practised by recent migrants lacking integration into the urban economy and culture. The modernisation school includes Gould (1970), Riddell (1970), Rostow (1960) and Soja and Tobin (1972). Their basic premise hinges on the idea that a change toward development is uni-directional, progressive,
gradual and irreversible, moving societies from a primitive stage to an advanced stage. As such, they perceive the western-based style of industrial cities as an indication of economic prosperity and technological progress, which every city in the developing countries should aspire to become. Hence, they perceive the growing trend of farming in cities as an obstacle to modernity, development and technological progress. Thus, to the modernisation school, those who undertake urban cultivation should be viewed as lacking economic, social and cultural capacities to integrate into the sophisticated social fabric of the formal urban economy, and they should be blamed for the degradation of the quality of urban life. Implicit in their argument is the notion that for cities to become modern, municipal authorities and policy makers should not tolerate or accommodate food cultivation in cities. It should however be noted that the modernisation perception is waning as well as not recognise as relevant theory in contemporary development debates on Africa.

The second set of theoretical responses to urban agriculture, the Marxist school, emerged during the early 1970s, after the international community recognised the crucial role that urban farming can play in urban development, and made a plea to city officials to support the sector in their policy and budget developments (Sanyal, 1987). According to Portes and Walton (1981), the Marxist school interpreted the plea for support to urban agriculture and other informal activities as a calculated attempt to revitalise and reinforce global capitalism. The Marxist proponents asserted that global capitalism has reached a crisis stage where it is experiencing a steady decline in the global profit rate, and that further profit accumulation can now only be ensured by shifting part of reproduction cost of social labour to the labour themselves. The Marxist school claimed that most capitalist firms could not afford to maintain the cost of urban labour, propelling a situation where urban labour is facing low wages well below the ability to maintain itself (Portes and Walton, 1981). Consequently, according to the Marxist school, the only means for capitalist firms to circumvent this
problem is to create the necessary condition for labour to engage in "extra-market means" such as subsistence urban cultivation. Thus, since rural food production cannot support the growing food demand of the urban labour, coupled with low wages for urban labour, urban workers are compelled to engage in subsistence farming in the city. Similarly, Desmond Jolly (1997) argued that the emergence of urban farming should be interpreted within the context of prevailing national and international policy discourse. According to Jolly, the failed policies of the massive exportation drive and urban-based development, coupled with the recent implementation of Structural Adjustment Programs (SAP) in developing countries have led to the rise in urban subsistence and urban enterprise farming over the last two decades. Thus, much of the impetus of urban agriculture arose out of desperation and the lack of viable alternatives. Jolly insisted that society needs to be concerned "that a heightened recognition of, and focus on, urban agriculture can become another chimera in the saga of development". He argued that, although urban agriculture has an important role to play, society must be careful not to oversell its potential. He also argued that the New World Order has witnessed the corporatization of public policy and the privatization of poverty, both of which have introduced the need for urban cultivation in most developing countries. According to Jolly, for the poor, urban agriculture is a defensive option, for the powerful, its a way to devolve social responsibility, and this is the essential dialectic of urban agriculture in the evolving New Order. Thus, in the view of the Marxists, any plea to support urban agriculture in the developing countries should invoke critical thinking on our part not to misconstrue it as an attempt to promote the economic livelihood of the urban dwellers in the developing countries, but it should rather be understood as a calculated attempt to maintain the status-quo of global capitalism. They also argued that the promotion of urban agriculture, or the urban informal sector as a whole, contributes to a "double exploitation of labour", since labourers are not only paid less than they deserve at the
workplace, but must also contribute additional labour time at home in producing means of subsistence, benefits of which are ultimately captured by the employers in terms of higher labour productivity and profits. Thus, in the view of the Marxist proponents, survival strategies such as urban cultivation do not contribute to the well-being of the labour, on the contrary, they increase labour's vulnerability and scope for exploitation. The Marxists' solution to the problem of urban poverty is to increase the monetary income earned by the urban poor to reduce their vulnerability within predominately exchange economies.

However, based on a survey of urban agriculture in Zambia, Sanyal (1987) strongly refuted the assertions of both the Modernisation and the Marxist schools. He suggested that urban agriculture is a response to the failure of modernisation to improve the living standards of the urban population. He revealed that urban agriculture has the potential to contribute positively to the economic well-being of the urban population, and should be seen as an initiative from the lower stratum of the civil society as opposed to the modernisation initiative which is a top-down approach which denies the needs of the poor and treats them merely as a factor of production. Sanyal (1987) also noted that the Marxist interpretation overlooks the fact that large-scale urban production is practised even in socialist countries such as Poland, and self-help activities are encouraged in socialist countries as well as capitalist countries. He also jettisoned the Marxist notion that urban agriculture increases the vulnerability of the urban population and, that, to reduce such vulnerability, the monetary income of the poor be increased. According to Sanyal an increase in monetary income of the urban poor will not necessarily benefit the poor under the prevailing conditions in developing countries, especially the inflationary circumstances. Hence, he perceived urban agriculture as an activity which insulates the urban poor from the effects of inflation and market, and reduces their vulnerability under such conditions.
Whereas both the Modernisation and the Marxist proponents focused their attention on the viability and importance of urban farming in the context of urban development and progress, proponents of the Dependency school brought a different perspective to the debate. The Dependency school criticised the "dualist" model which separates informal and formal sectors of the urban economy, and which advocates the informal sector as a solution to the problem of urban unemployment. Critics such as Gerry (1979) are of the opinion that the informal sector (or urban agriculture) cannot improve the living standards of its operators because linkages between the formal and informal sectors are characterised by a dependent relationship. They questioned, based on this relationship, whether informal sector activities such as urban farming, have the capacity for growth, and thus can make a meaningful contribution to the urban household economy, or whether they are just basically parasitic and transitory in nature without any practicable and sustainable usefulness. The issues raised in these theoretical debates have focused on a number of compelling problems which constitute the key questions for this research - whether urban agriculture is a sustainable initiative for employment and income generation? whether it should be classified as a transitory urban activity or a permanent feature of the urban landscape? what is the institutional or official position on urban farming? whether urban agriculture is feasible in the light of the compelling problems and constraints facing the sector?
2.2.4 **Urban Agriculture in Poor Cities: A Neglected Opportunity**

Evidence abounds that urban agriculture is taking place and is increasingly becoming a common feature on the urban landscape especially in the developing countries (Sanyal, 1985). Exploring factors to account for the growth of urban agriculture in Africa, Aipira (1995) reveals that employment uncertainties and low and irregular incomes are forcing low-income households in African cities to find alternative ways of supplementing their food supply. He pointed out that rural food production is falling short of urban requirements due to the high cost of farm inputs, the shift towards the production of non-traditional export crops, and the increase in labour migration to urban areas.

In spite of the crucial role that urban agriculture can play in urban development, the cultivation of food crops within the overall boundaries of towns and cities has been forgotten or ignored in the last 20 years (Rakodi, 1988). A similar view was also expressed by authors such as Sach and Silk (1987), who suggested that there is a little research on this sector because social science research had difficulties quantifying its impacts. Also, Freeman (1991) and Rakodi (1988) asserted that urban agriculture is neglected because it is still perceived as an ephemeral urban land use, while Sawio (1993) gave the reason as a perceived notion of urban agriculture as substandard living by some elites, bureaucrats and planners. In reviewing the contribution of urban agriculture to the economy of Botswana, Lesotho and Sweden, Greenhow (1994) asserted that it is very surprising that urban agriculture has received so little deliberate attention from urban planners, sociologists and economists. He argued that much of the literature on the subject of sustainable cities focuses on the problems of energy and transportation, rather than on the basic ability of urban places to feed themselves or deal with wastes. Placing their arguments in the context of Africa, Lee-Smith and Memon (1993) maintained that until recently, “research on urban agriculture and
reference to it in the literature on African urbanisation have been very sparse" as farming activities were considered unworthy of serious study because they were assumed to be economically unimportant and detrimental to urban and economic growth. They maintained that urban agriculture is usually considered by some researchers and planners as illegal and scarcely deserving mention, even in studies of the informal sector.

However, in recent times urban agriculture has become a subject of growing interest and serious enquiry by authors such as Sach (1985), Freeman (1991), Maxwell and Zziwa (1992), Sawio (1993) and Greenhow (1994). Most of these studies recommended that more must be done to understand the spatial, economic and ecological impacts of urban agriculture on the urban environment (Greenhow, 1994). Smit and Nasr (1992) suggested that future research in urban agriculture should stimulate the analyses of the farming systems that make up urban agriculture, the cost and benefits of urban agriculture and studies on the implications of urban agriculture on urban planning, environment and poverty. The crucial role that urban agriculture can play in urban development has not only interested individual urban researchers but has also attracted the attention of the international community. For instance, the International Union of Local Authorities had panels addressing city farming at their 31st World Congress in Toronto in June 1993. In the following year, the Global Forum'94 in Manchester convened 50 city delegations from the North and the South. The forum conducted an Advisory Workshop on Urban Agriculture where delegates representing 25 of the 50 cities invited, acknowledged urban agriculture and qualified its impact as positive (Mougeot, 1994). The interest in urban agriculture reached its pinnacle when in August 1994, in a Declaration on Social Development and Sustainable Human Settlements issued at the International Colloquium of Mayors on Social Development (ICMSD) at the U.N. in New York, over
100 mayors from around the world invited the various sectors of society to join them in six categories of actions for the sustainable social development of their cities. At the top of the agenda:

"Reducing urban poverty by providing productive employment for the poor and the jobless in the private and public sectors, promoting urban agriculture and supporting micro-enterprise development through credit and training, particularly the informal sector" (ICMSD, 1994).

However, in spite of the recent interest in urban agriculture and its role in urban development, the writings are largely focused on Asia (Yeung, 1986) and Latin America (Gutman, 1986), and most are primarily based on secondary data (Lee-Smit and Memon, 1993). That is, writings on urban agriculture in Africa remain sparse, and the few ones which do mention urban farming in Africa mainly rely on secondary sources. The International Development Research Centre, through studies conducted by Lamba (1993), Chimbowu and Gumbo (1993) and Diallo (1993), has focused its attention on urban cultivation in Africa and suggested that further research is needed in urban agriculture to analyse input constraints to urban agriculture, land use zoning systems supportive of urban agriculture, enabling legislation that provides support for agricultural activities in urban areas and mechanisms that aid the harmonious integration of urban farming with the rest of the informal and formal economy.
2.2.5 Urban Agriculture Within the Context of Urban Development

Urban agriculture is an urban management tool that addresses poverty, income and food issues in urban settlements, especially in the developing countries. Exploring the causes of the food crisis in cities in the developing countries, Ratta and Smit (1993) asserted that urban hunger is more a result of economic incapacity of the poor to purchase food rather than the absence of food in the market. They suggested that the adjustment programs engineered by the World Bank and the International Monetary Fund (IMF) have worsened the plight of the urban population in terms of their ability to acquire basic social services. They expressed the view that the structural adjustment program has set forth a stage where official wages and salaries of public employees, who usually earn a regular income, can hardly match current costs of living. However, Ratta and Smit's assertion was disputed by Sawio (1993b) who finds that, in the case he studied, urban hunger is more of a supply problem than a market problem as food shortages reflect the long trends of rural agriculture stagnation. Sawio attributed declining rural food production to climatic anomalies and the lack of transportation facilities to transport grains and other commodities from the producing rural centres to the consuming urban centres. Under such circumstances, rural agriculture will be incapable of producing a surplus to feed the soaring population in African cities. Sawio's argument is plausible, but it is not always correct in some food insecurity cases in Africa. Most critically, food production growth has been dismal in all but a few African countries. World Bank estimates indicated that only 9 African nations have experienced increases in per capita food production, while 24 countries have experienced declines, and the impact is more noticeable in cities (World Bank, 1991).

The growing urban demand for food and the inability of the rural sector to meet this demand has prompted some urban dwellers in Africa to undertake some form of cultivation. O'Connor
(1983) notes that "farming is the chief activity of many city dwellers in West Africa", and even in the Copperbelt of Zambia, where small-scale cultivation was not permitted before independence, many city dwellers have small farms just beyond the urban area. Rogerson (1993) also observed an increase in the practice of urban food gardening and the cultivation of vacant land on the peripheries of South Africa's metropolitan areas. To attest to the importance of urban cultivation in urban development, Ratta and Smit (1993) provided specific estimates of the proportion of the labour force engaged in urban agriculture as 67% in Nairobi and 60% in Taiwan. In Kenya, the 1986 data from the Central Bureau of Statistics revealed that 17.5% of self-employed workers and unpaid family workers and 3.5% of paid employees in urban areas worked in the agricultural and forestry sectors (House et al., 1993). Agriculture was also the second largest of nine economic activities listed among self-employed and paid employees in Kenya, absorbing 24.4% of Nairobi's and 33.6% of urban Kenya's sector jobs (House et al., 1993). In addition, agriculture provided the highest self-employment earning in small-scale enterprises in Nairobi and the third highest earnings in all of urban Kenya (House et al. 1993). According to Kenya's 1988 census, urban agriculture ranked as the city's second largest employer, after petty trading in Kenya; it occupied 11% of the population aged 10 or more, turning out about 100,000 tons of food crops annually (Mougeot, 1994). In Daloa, in Cote d'Ivoire, about 456 rice farms were estimated to be located in the city, in addition to 55 poultry farms, 113 pig farms and 110 fish ponds in the city's immediate vicinity (Mougeot, 1994). In respect of space coverage, Streiffeler (1987) notes that in Zaria, in Nigeria, aerial photography showed that 66.2% of the urban area is being cultivated, while in Dar es Salaam, in Tanzania, satellite imagery reveals that as much as 23% of the city region is used for agricultural production, with nearly 34,000 ha under crops in 1988.
Stren (1986) also revealed that in the valleys on the southern fringes of Kinshasa, a great deal of market gardening is undertaken, to the point that virtually every fertile, unoccupied space seems to be cultivated, and even in Yaounde, where the urban economy is buoyant and formal planning mechanisms operate relatively normally, market gardening flourishes on the outskirts of the city and in the city itself. Examining the state of urban agriculture in Asian cities, Yeung (1987) revealed that Shanghai, although a city province which is administratively not comparable with most African cities, was able to feed 3 million of its inhabitants with food drawn from a 100 km radius, and today, according to Gutman (1986), Shanghai is self-sufficient in vegetables and most grains, and produces significant proportions of its pork, poultry, and other foods, and exports surplus grains and vegetables to other cities and provinces. In Suva, Fiji, 40% of families are engaged in horticulture, while in Kathmandu, Nepal, 37% of households raise horticulture crops and 11% raise animal (UNDP, 1996). In the Port Moresby metropolitan area, Papua New Guinea, about 80% of all households take part in some food production (UNDP, 1996).

Urban farming is not only significant and noticeable in the developing countries, but also its presence in the developed countries is well noted. For instance, a total of 2,475 community gardens, ranging from 1,000 in New York City down to 30 in Seattle and Metro Toronto, have been recorded in nine North American cities (Mougeot, 1994). In the United States, the U.S Department of Agriculture figures for 1980 indicate that one-third of the country's agricultural economic product is produced within urban metropolitan areas\(^1\). The National Gardening Association surveys also indicated that about one in four urban families grow some food in the United States (Ratta and Smit, 1993), while in 1984, family total production of food for self-consumption reached 12 billion dollars. It is estimated that some 3 million individuals across the United States are able to operate in

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\(^1\) Agricultural economic product defined here include processed food and vegetables from agro-based industries located within metropolitan regions of the US.
community gardens on borrowed, loaned or rented properties (Ontario Public Interest Research Group, 1986).

In the Bronx, New York, the Green Guerrillas have transformed vacant land and urban wastelands to productive, beautiful and recreational city farms (Mollison, 1988). An urban farm, the Glie Farm in South Bronx, provides 8% of New York’s herbs and provides employment for many people in an area of urban decay (Goode, 1990). Mention can also be made of the productive Schreber gardens or mini-farms in Germany, which are presently in almost every settlement and provide food and recreational needs for the urban inhabitants (Mollison, 1988). In Toronto, the city’s Department of Parks and Recreation currently provides a total of 358 allotment gardens at three locations. Within metropolitan Toronto, the six area municipalities of Etobicoke, East York, North York, Scarborough, Toronto and York, each possesses an urban agricultural program called "The Allotment Garden Program", with a total area of 6.2 ha with a total of 1,727 plots, and as much as 3,454 persons or 1,727 families engaged in the program. There is even a growing "waiting list" of people to be allocated the allotment gardens, and this is an indication of the growing interest and importance of urban agriculture in metropolitan Toronto.

In analysing the characteristics of urban agriculture in Kenya, Memon and Lee-Smith (1993) demonstrate that the economic value of urban subsistence production nationally is both significant and crucial to the survival of the poor. Mbiba (1994) posits that urban farming possesses the potential of promoting the urban economies of the urban poor; particularly the urban low-income families, women and children in Zimbabwe. He estimated the annual value of urban agricultural production in Maseru, Zimbabwe, at maloti 6,705,000. In establishing the link between poverty reduction and urban agriculture, Firdausy (1994) contends that while rapid economic growth and increased efficiency of resource use are necessary to reduce poverty, they should be
complemented by some direct policy interventions in favour of the urban poor. He mentioned these to include improvements in access to basic needs and services and productive employment. Ratta and Smit (1993) identify various benefits associated with urban agriculture to include a means of improving food supply and food security of the poor, providing income for farmers and related enterprises, and promoting self-reliance and self-sufficiency. Whereas Ratta and Smit (1993) emphaes the economic benefits of urban agriculture, authors like Streiffeler (1987) and Smit and Nasr (1992) placed their emphasis on the environmental benefits of urban farming. They insisted that urban agriculture is a regenerative agriculture that restores degraded land and unused land, recycles waste as inputs to production and reduce urban pollution and energy consumption as food is produced close to the consumers. They provided three approaches to the relationship between urban agriculture and resources. First, some urban by-products, such as waste water and organic solid waste, can be recycled and transformed into resources or opportunities for growing agricultural products within urban and peri-urban areas. Second, some areas of cities, such as idle lands and bodies of water, can be converted to intensively agricultural production. Finally, some natural resources, such as energy for transportation and cooling, can be conserved through urban agriculture. Deelstra (1987) also noted that urban agriculture has favourable effects on air circulation, temperature, and humidity levels in the cities, as well as protecting soil from erosion and dispersing noise and dust in the air. Smit and Nasr (1992) describes how cities can be transformed from being only consumers of food and other agricultural products into important resource-conserving, health-improving, sustainable generators of these products. In particular, urban agriculture can convert urban wastes into resources, put vacant and under-utilised areas into productive use, conserve natural resources outside the cities while improving the environment for urban living.
2.2.6 **Constraints and Limitations to Urban Agriculture**

However, some authors have refuted the arguments that urban agriculture has a strong potential in alleviating urban poverty and promoting ecological integrity. According to Gutman (1986a), family or community urban gardens are micro-scale initiatives with a high rate of failure. He asserts that, in his observation and monitoring of urban agriculture in Latin America (especially in Greater Buenos Aires), the rate of growth in the number of gardens was slow and the level of abandonment was high. He insists that urban agriculture only constitute a short-term solution for the nutritional problems of most of the urban poor in developing countries; they can complement, but they cannot replace, programmes of income redistribution. However, in his later work, Gutman (1986b) conceded that although urban agriculture cannot replace other strategies, they surpass programmes of income redistribution because they generate independence rather than dependency. Streiffeler (1987) also doubted the potential of urban agriculture when he observed declining yields from an urban agriculture project in Kisangani, possibly attesting to the fact that, in his view, there is no long-term future for the activity. But, this assumption can be discounted on the grounds that the declining yields associated with urban farming as observed in Kisangani and Buenos Aires may have nothing to do with the long-term viability of the sector but rather to resource constraints, which if resolved, would have eradicated the problem of declining yield. Presenting a critical view on urban agriculture in Greater Buenos Aires, Gutman (1986b) insisted that urban gardens do not benefit the poorest groups so much as some authors speculate, but rather do benefit the higher income group who can afford the high cost of urban land and have easy access to bank credit. A contrasting view was presented by Streiffeler (1987), who argued that it is primarily the wealthy (big merchants) with their own means of transport and who act as middlemen between the rural producers and the urban consumers that stand to lose most from home-production of
food. Gutman (1986a) also indicated that urban agriculture is a waste of urban space as the rural economy provides more efficient and effective means of producing food to feed the country than the urban space. However, this allegation was refuted by Mbiba (1994) and Lee-Smith and Lamba (1991), who revealed that studies in Kenya and Lesotho point to higher yields per unit area for urban agriculture when compared to rural rain-fed production. Thus, urban plots are more productive than rural plots, probably because of the use of water and organic inputs.

Assessing the impediments to urban agriculture in Asia, Yeung (1986a) suggested that the most compelling problem facing the sector has been the encroachment of urban farmland by urban dwellers as infill of urban settlements occurs. He cited Taipei, where farmland once provided 70% of the vegetables consumed by the city's population, but by 1974 this proportion had dropped to 30% because of the reduction of agricultural holdings in the face of urban expansion. In Korea, Song and Lee (1984) revealed that a total of 1,016 km² of agricultural land has been converted to non-agricultural uses during the past 10 years. Di-castri (1981) identified a number of other factors which are inhabiting urban cultivation. These factors include lack of overall policies and goals, lack of information systems to collect and process research data, and poor inter-agency co-ordination.

Eguillor (1993) identified other constraints to urban agriculture such as the problems of vandalism and air pollution from lead, cadmium, nickel and salt as most urban farms are located near streets or major routes. Gana (n-d) on the other hand, emphasised marketing and distribution as the main problems associated with urban food supply in Nigerian cities. He quotes an FAO source which indicated that the cause of urban food crisis in Nigeria is not due to a fall short in food supply but rather due to a food distribution problem which is attributed to the incredible neglect of the storage, processing, distribution and standardisation of marketing procedures. Wade (1986) buttressed Gana's assertion by insisting that getting food to the tables of low-income urban residents depends
upon the quality of the local transportation system, the location and quantity of markets, the system of marketing and various factors that affect the final cost and accessibility of food. He cited the case of Maputo, in Mozambique, whose most of its one million residents are involved in extensive market gardening but poor transportation between the production areas and markets has limited gardeners' ability to increase food production. In contrast, Chinese cities have been self-sufficient in fresh vegetables and some other foods since the 1950's as a result of a highly organised market-gardening program. Excellent transportation arrangements between the fringe farms and city-controlled markets allows for maximum efficiency and rapid delivery to large distribution centres in the inner city. Rakodi (1988) presented a balanced perspective on the productivity of urban agriculture in Zambia by revealing that insecurity of tenure, dependence on rain-fed agriculture and the problems of theft may go to reduce output, but the availability of piped water, household compost and women's labour-time may boost production as well as encourage intensive cultivation. Rogerson (1993), explaining why urban cultivation has been underdeveloped in South Africa, revealed that the key explanation is low returns to land and labour of urban farming as compared to other urban uses to which backyard shacks could be put, such as commercial development (neighbourhood shops). Streifeler (1987) argues that one cannot fully blame the local authorities for the underdevelopment of urban agriculture in Africa, but the industrialised countries must share part of the blame for their unwillingness to fund urban garden projects.

Referring to the importance of urban farming to urban planning, Lee-Smith and Lamba (1991) acknowledged the need to incorporate crop and livestock production into urban planning as the poor need local government services to support and enhance these activities. Memon and Lee-Smith (1993) also underlined the significance of incorporating urban farming into urban theory and sustainable urban development. They suggested that as part of promoting urban greening, crop
and livestock extension services need to be made more available in urban areas, and this should be directed to women. Streifeler (1991) asserted that the social aspects of urban agriculture should be understood as well as the wide range of factors that block its development. Wade (1986) identified appropriate land-use zoning as an area where urban farming can be encouraged and promoted. He postulated that city governments can accomplish a great deal by using existing urban land planning instruments and resources to facilitate self-help food production initiatives in cities. Di-Castri (1981) identified the isolation of scientists, planners and managers from each other as an impediment to collaboration to improving food production in the cities. It is in this vain that Eguillor (1993) asserts that due to the multidimensional aspects of urban agriculture, the planning and implementation process should involve a number of different actors, each representing the various concerns of the population, while Wade (1986) suggests systems approach to food production and its links with other sectors as the most effective strategy. It is in the above sense that the Toronto Food Policy Council and the Healthy City Project helped to establish an Inter-departmental Working Group on Urban Food Production composed of the Departments of Housing, Planning and Development, City Property, Building and Inspection, Public Health, Parks and Recreation, and Public Works and the Environment. This group is responsible for assessing the capacities and expertise of various city government units and issuing recommendations as to how to support food production in the city. In Montreal, a similar initiative is being undertaken by the Department of Recreation and Community Development which is responsible for Montreal's community garden program and co-ordinating the involvement of other departments such as Habitation and Urban Development, Provisioning and Buildings, Public Works, and Planning and Policy (Mougeot, 1994).
In spite of the long history of food cultivation within the Accra Metropolitan Area (AMA), there has been no complete record of its development over time. Written information on the activity is scanty and scattered all over government publications and metropolitan planning documents; in most cases, the activity is mentioned only in reference to major events under discussion. To understand the present system of urban agriculture in AMA, it is important to explore its development over time by examining events and activities that have shaped its growth and development. This section provides the first step towards a complete historical account of the development of urban agriculture within the Accra Metropolitan Area (AMA). The objective is to explore critical variables and urban dynamics that have significantly influenced the evolution of urban agriculture in the study area. This account is made with reference to three historical phases; pre-colonial era, colonial era and post-colonial era.

3.1 The Pre-colonial Era

Accra, the capital city of Ghana, lies in the central coastal belt of the country. In the pre-colonial era, the present-day settlement of Accra was then known as Ga-Mashie. The earliest known settlers were the Kpeshie people. However in the 16th century, the Ga-speaking migrants, believed to have come from Niger, were absorbed into the community and became an integral part of the people of Ga-Mashie. Although, currently, most of the Ga settlers are located along the coast, the original settlers were some miles inland where their means of livelihood was land
cultivation (Acquah, 1958). In pre-colonial Accra, the population was scattered and there were no aggregated communities; hence, each family had to be self-reliant and produce its own food and vegetables sufficient to meet the family nutritional requirements (Acquah, 1958). Thus, during this period, the people of Ga-Mashie were agrarian, and providing food for subsistence living was their most basic necessity. Hence, the dominant use of the land in pre-colonial Accra was for food production and animal keeping.

With the rising interest in the acquisition of other basic needs besides food among the people of Ga-Mashie, a barter system of exchange became a prominent feature in the household distribution network (Dickson, 1969). Producing food not only for personal or household consumption but also as a means to acquire other basic needs to enhance their living standard, propelled households to increase food cultivation to create surplus production for exchange. Thus, a system of community specialisation which came to displace household self-reliance, provided a boost to food cultivation in pre-colonial Accra. As can be expected, whereas the barter system indirectly gave a boost to food cultivation, it also led to a decline in the number of people involved in food cultivation as some of the local people moved from farming to other occupations. Thus, occupations such as fishing later became prominent among the Ga people as some moved to the coast to have access to the sea for fishing (Field, 1940). Coastal migration led to the development of two settlements namely, James Town and Ussher Town, with fishing as their dominant occupation (refer to Fig. 3.1). Thus, while the towns established along the coast by the Ga migrants were basically fishing enclaves, the Ga settlements in the inland were primarily engaged in subsistence agriculture. This led to a dichotomy of the economy of pre-colonial Accra - coastal settlements specialised in fishing and inland settlements specialised in food farming - but linked by a system of barter which facilitated exchange between them.
Another significant pre-colonial event that influenced food cultivation in Ga-Mashie was the development of mercantilism (Field, 1940). The early 17th century saw a surge in coastal trade between the European merchants located along the coast and the non-Ga people in the far hinterland (the Akwapims, Juabengs and the Kwahus). The Europeans traded gun and gun flints for gold dust, palm oil and local slaves from the people in the far hinterland (Acquah, 1958). This trading activity led to the growth of the coastal enclaves as important trading posts.

Some of the Gas, both inland and along the coast, became actively involved in the trading activity as they became middlemen between the Europeans and the people in the far hinterland. The trade became very lucrative to the extent that the Europeans, for the first time, acquired land, built forts and established permanent trading posts (Acquah, 1958). In addition, they constructed a number of residential buildings (Poguchi, 1953).

This development had some significant implications for food cultivation among the people of Ga-Mashie. First, the interest in food cultivation dramatically declined as trading became more lucrative and profitable than food farming. Consequently, a growing number of the local people shifted from food cultivation to become middlemen in trading. Secondly, some local inhabitants who were still involved in farming changed the scale of their operation from producing food for themselves (and/or for limited exchange with other local inhabitants) to cultivating food purposely to meet the food needs of the European trading posts. This is due to the local Ga farmers interest in cultivating food for exchanging for the products of the Europeans which they found to be more economically rewarding than exchanges with the local inhabitants. Thus, the local inhabitants who were involved in fishing and trading activities and who used to rely on food produced by their fellow town-folk, now had to rely on food produced from the rural hinterland, as they were excluded from the local food exchange and marketing. An interesting exchange arrangement developed at this point; while the European relied on the indigenous people (Gas) for their food needs, some Gas in turn relied on food supply from the far hinterland (rural areas) produced by the non-Ga settlements.
Fig. 3.1 STAGES OF GROWTH OF ACCRA, 1830 - 1956

1830 SETTLEMENT OF TWO FISHING VILLAGES

1895 ROAD DEVELOPMENT LINKS TWO FISHING VILLAGES

1908 MERGER OF TWO FISHING VILLAGES

1930 EARLIER GROWTH DUE TO COMMERCE AND DEVELOPMENT

1945 GROWTH ALONG IMPROVED COMMUNICATION LINKS

1956 GROWTH RESULTING FROM URBANISATION

The only Ga settlement which had still remained essentially agricultural was Labadi. This was because Labadi was a walled village protecting itself from raids by the neighbouring Akwamus, and contained a people devoted to the traditional occupation of food cultivation, animal husbandry, fishing and the extraction of salt from the nearby lagoons (Dickson, 1969). At this point, two important issues need to be noted; one, the pre-colonial settlement of Ga-Mashie was not urban by any standard, and; two, during this period various lands were under the control of the natives as the Europeans had not given any indication of their desire to reside in the area for long, due perhaps to the harsh climatic conditions. Thus, colonialization was not yet formalised.

3.2 The Colonial Era.

In the 19th century, the coastal belt and the interior protectorate of Ghana (then Gold Coast) were colonised by the British. During the colonial era the settlement of Ga-Mashie was officially renamed Accra by the colonial authorities. With colonialization, the position of the European trading posts and forts changed to become centres of administration, security and official residence. The change in the status of the trading posts came along with the desire on the part of the European traders to acquire more lands for residential, administrative and commercial developments. Considerable amounts of land were taken away from the indigenous people by compulsion and placed under colonial control with the purpose of constructing more houses to accommodate the colonial officials, office duties and trading activities (Acquah, 1958; and Poguchi, 1953). Most of these lands were fertile land already under food cultivation or left to fallow after some of the local inhabitants abandoned them to be involved in trading activities.

While this colonial action adversely affected the indigenous peoples’ participation in local food production, it also led to the decision on the part of most European merchants and the colonial officials to engage directly in vegetable cultivation to produce their own food (The Ghana Farmer,
Some amounts of the appropriated land were utilised for this purpose. The introduction of exotic vegetable cultivation in Accra could be traced to this period. Exotic vegetables grown by the Europeans were mainly asparagus, lettuce, cabbage, endive, radish, parsley, mint, thyme, sage, beans and artichoke (The Ghana Farmer, 1961). Before the introduction of exotic vegetable cultivation in Accra by the Europeans, food cultivated by the indigenous people were local staples such as cassava, plantain, pepper, okra and maize.

Why did the Europeans, who were so involved in a profitable venture of trading and were burdened with the intricate task of colonial governance, decide to get involve directly in food farming? Probably, the Europeans were not familiar with local foods and they wanted to consume crops they were familiar with. Secondly, the European held the notion that the indigenous cultivation of food crops was unhygienic and unsanitary, hence posed a health risk to them. By the middle of the 19th century, most of the Europeans merchants had established their own exotic vegetable gardens, and the practice had become relatively widespread. The Aburi Botanical Station was established during this period to supply the Europeans with regular exotic vegetables and to reduce their dependence on foreign sources for the supply of their seedlings (The Ghana Farmer, 1963 and 1967).

By the late 19th century, the Europeans extended their trade further to the interior, which was made possible by the development of rail and road transportation. The Gas continued to be the middlemen in the trading activities between the Europeans and the indigenous people in the far hinterland. However, following the growing power of the colonial government at the end of the 19th century, coupled with the conquest and the control of the Ashanti Empire and the Northern Territory at the beginning of the 20th century, the European contact with the indigenous people in the far hinterland were greatly facilitated (Acquah, 1958). Consequently, the Europeans firms were no longer dependant upon the Gas as middlemen.
The decision to drop the Gas as middlemen became more compelling as prices of exportable raw materials plummeted and profits by the Europeans firms declined. Inevitably, the Europeans reviewed their trading practices as more European agents were sent out to replace the Gas as middlemen, paving the way for the establishment of part-retail, part-wholesale European managed stores. This spelled the beginning of decline in African businesses and the rapid growth of European-managed stores. Most Gas, whose jobs were taken away from them, could not go back to farming, if they so desired, because most of the lands had been taken away from them and placed under the control of the British. Some were compelled to migrate to the interior to work in the mines while others resorted to fishing along the coast. Very few were able to go back to food cultivation, except those with backyard residential spaces, which they could cultivate for food and exotic vegetables (Field, 1940).

The political decision in 1877 to move the seat of the colonial government from Cape Coast to Accra also brought with it a dramatic growth in the use of land in Accra as there were increasing space requirements for government offices, residential accommodation and commercial premises. When Accra became the capital of then Gold Coast it essentially become an administrative centre and headquarters for most foreign firms, missions and the government. There were ample job opportunities in administrative capacities in most government and private services where the local inhabitants were employed, most of whom were still involved in backyard gardening on a part-time basis (Poguchi, 1954). This marked a departure from previous practice, where the local inhabitants frequently abandoned food cultivation anytime they secured other forms of employment, to a new direction where they worked full-time in the government services and at the same time, maintained part-time work as gardeners.

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2 In 1928, the amalgamation of several Europeans companies into the United Africa Company (UAC) further reduced trade in African hands (Acquah, 1958).
With Accra as a capital city, the Europeans built more bungalows and attractive accommodation for European officials. A new building regulation was instituted which required bungalows to have backyard space (Town & Country Planning Department, 1958). This regulation provided the impetus for the growth of backyard gardening in Accra. Thus, whereas the native communities were not planned but developed in a leap-frog fashion, the Europeans lived in a "garden city" type of lay-out with the residential areas of the colonial staff developed with very low densities. The European quarters were surrounded by a green belt of open space often called the "sanitary district". This was meant to safeguard the Europeans from the epidemics and diseases of poverty which had ravaged the indigenous population.³ The "sanitary district" also had access to regular water supply and sanitation facilities, and regular removal of wastes from households. The backyard spaces were mostly used by the European residents to grow their own food, mostly exotic vegetables. Thus, beginning with the creation of Victoriaborg in the 1880s, followed by the Roman Ridge, and later Cantonments, the development of settlement under the colonial government led to a social stratification system that spatially segregated people into administrative divisions. This created highly visible ecological barriers in Accra. The colonial elites enjoyed the amenities of greenery and spacious surroundings in government owned or rented quarters. The lower civil servants found themselves attracted to government low-cost housing estates, while the unaffiliated poor gravitated either to central Accra or to one of the peripheral squatter settlements.

The colonial government, in 1892, introduced a Town Ordinance designed to provide the colonial government with more powers to appropriate lands from the local residents including fertile farm land (Acquah, 1958). The land acquisition rights bill was passed which enabled the government to take large tracts of land from the native jurisdiction to be administered as "Crown Land" for various public purposes. This action undermined indigenous active participation in farming

³ In certain Nigeria cities, the green zone was to be at least 402.3 meters wide since it was believed that this was further than a malarial mosquito could fly (Hardoy and Satterthwaite, 1995).
as their access to land for farming was severely restricted. However, the outskirts were left under the jurisdiction of native rulers and family heads (Trevallion, 1958). In 1894, a Town Council ordinance was passed for the establishment of a municipal form of government at Accra. In this respect, in 1909, the Accra Municipal Council was established which embraced Ussher Town, James Town and the coastal strip eastwards including the Christianborg. In view of Accra's increasing importance as an administrative centre, there were improvements in roads, telegraphic and postal communications. Roads were extended northwards to Aburi, Akropong, Koforidua and Kumasi. A railway started in 1909, reached Nsawam in 1910, New Tafo in 1917, and Kumasi in 1923. The improvement in communication and transportation facilitated the link between Accra and other towns. This set the stage for a period of great expansion of Accra both in terms of population and in space, as the lure and fascination of urban life began to induce a steady immigration from all parts of the country to Accra (Fig.3.2).

Accra grew rapidly from a small homogeneous farming-fishing village into a heterogeneous modern township. In 1945, a new constitution came into effect which extended the municipal boundaries of Accra to include the town of Labadi on the coast two miles from the Accra core and some of the rapidly developing parts north and west of the older township. To the north of Ussher Town and James Town, Tudu and Adabraka developed to become commercial and residential districts. Korle Gonno, Korle Bu and Mamprobi to the west of the Korle Lagoon were also established, and extensions were made to European residential area north of Victoriaborg. In 1939, a serious earthquake shook Accra, causing considerable damage to property (Junner, 1941). In an attempt to re-house affected households, the government developed a vast stretch of grassland (agricultural plain), which lay south of the town of Nima, into a residential site for government, quasi-government and housing estates. This led to the development of settlements such as Korle Gonno, Christianborg, South Labadi, Kaneshie, Sabon Zongo and Abossey Okai (Acquah, 1958). The
effect was a decline in farming activities in what had been fertile, agriculturally rich areas (Ministry of Local Government, 1989).

However, the period between the two world wars also saw the diffusion of cultivation within Accra. Food production in the city was encouraged during the first world war, and revived during the second world war when farmers in Accra and other towns along the coast were encouraged to grow vegetables required in large quantities by the British Armed Forces stationed in Accra and other parts of the country (Ghana Farmer, 1961). This huge demand inspired both institutions and individuals to cultivate vegetables on a large scale to feed the military population and also to earn a living. The supply from producers in Accra was supplemented by departmental farms at Abakrampa and Komenda. Later the industry declined as a result of the cessation of hostilities and the subsequent withdrawal of the British and American Forces which had been the main consumers of the vegetables.

The development of cocoa trade between 1908 and 1921 also had a tremendous impact on the growth and development of Accra (Brand, 1972). The cocoa trade transformed Accra’s economy from primarily subsistence agriculture to one dominated by export agriculture. The earliest cocoa-producing districts of Akwampim, Krobo, New Juaben and Akim Abuakwa were ideally situated for trans-shipment through Accra. As production expanded, better farm-to-market roads were constructed, which linked Accra with the heart of cocoa producing centers. The heightened accessibility created by the railway, added to the existing road transport advantage of Accra, greatly reduced the costs of hinterland penetration; the processes of port concentration and hinterland capture were also stimulated. The growing importance of cocoa trade in Accra also led to the growth of foreign expatriates in Accra. In 1921, Accra led all other towns with a total of 540 resident Europeans, an increase from 242 in 1911 (Brand, 1972). The Europeans were attracted to Accra by a combination of two high-order functions, namely government and international commerce. Accra was intended in the
FIG. 3.2  THE SPATIAL GROWTH OF ACCRA, 1830 - 1990.

Source: Strategic Plan for the GAMA - Accra.
colonial scheme of governance to serve as the seat of administration and as a principal entrepot to facilitate the exploitation of agricultural products. In a real sense, Accra was conceived by government and nurtured by cocoa, and both enterprises were dominated by the expatriates. About 37 of the 57 cocoa firms were owned by European expatriates, and two-thirds of these originated between 1913 and 1920. About 21 European cocoa firms sprang up during the economic booms of 1918 and 1919 alone. Railway lines became centers of attraction for these firms to off-load cocoa for shipment (Brand, 1972b). More spacious and less expensive sites were needed as cocoa firms required drying and storage facilities to cope with the perishability and sheer volume of the commodity. Thus, the growth of the cocoa trade influenced land use in Accra as tremendous demands were made on open space for siting the marketing firms and drying and storage facilities.

Towards the end of colonialism, there was a rapid growth in urban population in Accra due mainly to migration. Accra’s population grew from a humble 17,829 in 1901 to 133,192 in 1948 and 192,047 in 1954 (Ministry of Local Government, 1989). The effect of the net-migration to the city of Accra has been a scarcity of low cost space in the Central Business District (CBD). The migrants’ solution to the scarcity of low cost space in the CBD was to locate just outside the city boundary where peripheral settlements or suburbs started to develop. The settlements of Nima (formerly, Fulani Village), Accra New Town (formerly Lagos Town), Sabon Zongo, Maamobi and Kotobabi could be attributed to immigrants. These settlements were at first outside the jurisdiction of Accra but later became part of the metropolis when the boundary of the city was extended in 1954. According to Brand (1972), there were a set of traditional activities including farming associated with these low-status migrant communities, which he classified as “Urban Villages”. These tradition-bound settlements were found both in the central city and on the periphery; 8 of the 21 tracts classified as traditional were found in the core; the remainder form a fragmented arc at greater distances from the CBD (Fig. 3.3). Those on the eastern and western margins were essentially
agricultural communities, where courtyard farming is undertaken to produce food, poultry and livestock.

Accompanying the growth and expansion of Accra were the extension of some social and economic developments, including the opening of many government secondary and technical schools. More migrants therefore moved to Accra to enjoy the employment avenues created especially in the construction industry as well as the educational facilities. With rapid migration to Accra, a number of residential areas were created, including the suburb of Cantonments which was built exclusively for European merchants and government officials (Ministry of Housing, 1958). The city grew in all directions (see Fig. 3.2). To the north-west of the low swampy flood plains of the Korle Lagoon, was Kaneshie estates which was built to house junior government officials. This plain was formerly under seasonal rice production, which was harvested and supplied to the local market to meet the demands of the government officials and the construction labourers (Boateng, 1959). With the economic boom, coupled with the growing shortage of accommodation and high cost of accommodation in Accra, the colonial government took a significant step to aid the crusade towards more affordable housing (Ministry of Housing, 1958). Some inhabitants also used their fertile land for more housing instead of producing food for the reason that they could afford to rely on food brought from elsewhere (the rural hinterland) but not the cost of accommodation which was skyrocketing (Poguchi, 1954). The effect of all these processes of development was to convert the formerly diverse and recognisably separate parts of the urban system into a built-up area surrounded by more scattered suburbs.
Fig. 3.3  URBAN VILLAGES IN THE CITY OF ACCRA, PRIOR 1970

Source: Brand, R. R. (1972a)
3.3 The Post-Colonial Era

Immediately after independence, the 1958 master plan for Accra was proposed. The plan sought a massive renovation of designated slum areas of Accra, and specifically, the demolition of traditional areas of Ushertown and Jamestown and the migrant community of Nima and remedial treatment for Labadi, Osu and some parts of Accra (Kooperman, 1987). The demolition exercise partially took effect in 1961 when the queen of England was due to visit Ghana. The government demolished parts of Jamestown and Ushertown, and relocated the residents west of the Korle Lagoon. As a result of a strong protest from some residents and the government's limited financial capabilities, the exercise was discontinued and instead the government constructed high walls around some of the dilapidated streets of Jamestown, Ushertown and Osu (Kooperman, 1987). In 1963, government interest in slum demolition was revived when the National Physical Development Plan indicated that 55% of Accra was a slum. In attempt to make Accra a "show-piece" of Ghana, the government appointed a Slum Clearance Committee headed by the then Minister of Housing, F.H. Tackie-Menson, to advise the government on how to improve those areas the government commonly regarded as slums (Town and Country Planning Division, 1965). Labadi and Nima became the target for slum clearance where most buildings were demolished, and since many traditional activities were associated with these slums areas, activities such as gardening were also actively destroyed.

On the economic front, immediately after independence, the Convention People's Party (CPP), the ruling government, embarked upon a policy of massive industrialisation to diversify the country's economic base (Kraus, 1988). The main thrust of the policy was to establish import-substitution industries. The twin city of Accra-Tema became the central location for most of these industries. Klu (1985) estimated that by the mid-1980s more than 60% of Ghana's industrial establishments were located in the Accra-Tema Metropolitan Area. Unfortunately, in Accra, most of
these industries were sited on open or vacant spaces including marshlands and fertile lands surrounding the Korle Lagoon. The implication was that some local farmers lost their farmlands to this industrialisation process while others were pushed to relocate their farms elsewhere, mostly along the new fringes of the city - creating more distance between home and farm. The expansion of the manufacturing and commercial sectors immediately after independence also created, among other things, dwindling living space in the inner city, particularly on the fringes of the CBD where commercial invasion became intense. The outcome was an increase in the cost of accommodation (rent) beyond the reach of most low-income earners; hence, most were compelled to seek accommodation in the periphery, where land and accommodation costs were cheaper (Ministry of Housing, 1958). As they migrated to the periphery they also moved with them their farming activities, shifting the focus of farming from the inner city to the periphery, with urban cultivation in the inner city confined to recreational spaces of senior/middle level public officials. These were enclaves of well laid-out bungalows with large gardens built to accommodate expatriate colonial officials which were subsequently passed on to indigenous senior civil servants. However, the implication for urban cultivation this time was quite different. Whereas under the colonial government, the expatriates themselves, who occupied these bungalows, were directly involved in vegetable cultivation in their backyards, the post colonial senior civil servants were not interested in cultivating the land, but rather they allowed the low-income inhabitants from elsewhere in Accra to cultivate this piece of land for free.

The post-independence government decision to build a new port in Tema - 18 km from Accra CBD - also had a remarkable impact on the use of land, particularly for food farming in the area. The government acquired 166 sq.km from the traditional owners by compulsory purchase to achieve this purpose (Amartefio, 1966). Initially, there was considerable local opposition and it was not until 1952 that the move to build the township was completed. Tema was then both a fishing and a farming town. When the government acquired the lands for the development of the Tema
township, the natives (the Gas) whose lands were confiscated were compensated with a provision of accommodation along the coast, at a place known today as Manhean. The non-natives (the non-Gas)\textsuperscript{4} on the other hand, were not offered any such compensation because the government claimed that they did not hold any traditional or customary title to the land on which they lived. Instead, the non-natives were allocated vacant plots at Ashiaman to build their houses. Two contrasting land use effects emerged from this government decision. The natives who were resettled and housed at Manhean could not continue with their farming activities as the land on which they were resettled was infertile and susceptible to erosion and salinization from the nearby sea. Thus, they were resettled in this new environment without due consideration as to how they could continue with their farming activities to maintain their livelihood. The assumption of the government was that with the establishment of new industries in Tema, many of these displaced people would be employed in the high-earning manufacturing sector and farming would no longer be important. The outcome was a decline in farming activities among the natives resettled in Manhean; however, fishing was practised by a few as the new location was nearer to the sea. The non-natives who were assigned plots of land at Ashiaman to build their houses were faced with a mixed situation. On one hand, they had to build their houses by themselves without government support, which most could not afford to do. On the other hand, the land upon which they were resettled was very fertile and vast enough to encourage them to continue with their farming activities.

The government decision to confiscate farm lands for industrial locations in Accra-Tema area was reinforced by two significant beliefs shared by the government: one, the road to modernisation and development is not agricultural but industrial development, and therefore that agriculture should play a secondary role to industrial development; and two, peasant or small scale

\textsuperscript{4}The non-natives include the immigrant population of Akans, the Krobos and the Ewes.
farmers involved in food production were unproductive and unscientific, and should be replaced by large-scale state participation (Kraus, 1988). In other words, there was the official belief that small “traditional” food farmers (who produced most of Ghana’s food) could not produce enough food to sustain the escalating urban food and food-processing factory needs. The government felt that only modern and scientific means (mechanised agriculture) could increase output rapidly, hence efforts should be channelled towards the use of modern inputs, management, and credit to promote mechanised agriculture. To reflect these beliefs, the CPP government implemented a policy of direct state participation in food production and marketing. The CPP government created the State Farms Corporation (SFC) with 22,000 workers and the Workers Brigade (WB) with 10,000 workers, and acquired vast amounts of land to cultivate industrial and traditional food crops (Government of Ghana, 1966). The government also established the Ghana Food Distribution Corporation (GFDC) to be responsible for food distribution and marketing in Ghana. Thus, scarce budget resources and trained personnel were diverted from peasant farmers to the SFC and the GFDC. However, these institutions systematically drained scarce resources for the government. The SFC and WB performed poorly in terms of food production and generated enormous losses because labour employment dominated production goals, and there was an inadequate supply of managerial staff (Miracle and Seidman, 1968). They grew less than 1% of the total food produced in Ghana in 1974, while they used 0.5% of agricultural labour on 0.18% of land planted, with 27% of the MOFA’s planting materials and 28% of the MOFA’s extension officers (Nweke, 1978). In 1978, the GFPC produced and sold food worth 432,000 cedis but cost the government 19.2 million cedis (Kraus, 1988). In 1977, Ghana National Reconstruction Corporation (GNRC) was created with the purpose of preventing urban migration by youth by placing them on “settlement farms”. In 1977-79, with 21,000 young workers on 426 farms, the GNRC cost Ghana 60 million cedis and produced 1 million cedis worth of food. One reason why state participation in food production was not economically
viable was that they were required to sell their produce in the cities far below market prices. This is an attempt to lower cost of living in Accra and to politically silent the vocal urban population.

During 1963-65, food production fell and heightened food prices led to great criticism of the failure of the SFC and WB to achieve their objectives. Food prices rose by 28% in 1963/64 and by 29% in the 1965 due to rising urban demand, lower food production and sharp declines in food imports (Kraus, 1988). The new governments of the National Liberation Council (NLC) and the Progressive Party (PP), which came to power after the CPP government, did not favour the clearly unproductive SFC and WB farms. A central thrust of the NLC and PP governments food policy was to reduce the direct state involvement in food production and marketing, and to revive and open new opportunities for Ghanaian and foreign private entrepreneurs in food production, distribution and marketing. They promoted large-scale capitalist farming using modern agricultural methods and reduced the number of state farms from 105 in 1966 to 66 in 1967, and finally to 33 in 1971. The general belief was that increased food production should depend on capital-intensive commercial farming and this was expressed in the various banks credit support for large scale farming in Ghana in 1968/69. Thus, large-scale commercial farming was supported by a large expansion in agricultural credit during 1969-71 from the ADB (+181%), the Ghana Commercial Bank (+62%) and the National Investment Bank (+346%).

Additional support was also given to large scale commercial farming as the government sold state tractors to commercial private farmers, as well as made available to them, more credit, subsidised fertiliser, high-yield seed, and allowed foreign firms to farm in Ghana (Kraus, 1988). Most of these programs ignored small peasant farmers (Agricultural Development Bank, 1973). The focus of this program was on medium to large-scale farmers and educated non-farmers, many of whom took advantage of subsidised services and free land but were uninvolved in and uncommitted to agriculture (Kraus, 1988). The policy to promote food production through large-scale capitalist production was wholly ineffectual, and this led to a rising food prices vis-à-vis stable
### Encouraging Factors
- Segregated and self-contained pre-colonial communities.
- Military raids by neighboring Akwamus.
- European interest in cultivating their own exotic vegetables.
- The world wars and the stationing of foreign troops in Ghana.
- The establishment of Aburi Botanical Station.
- Declining profit from European trading activities.
- Building regulations which permitted backyard space.
- Formation of farmers' co-operatives society in Accra.
- The U.S.A operation missions in Ghana.
- The influence of foreign contact.
- The USAID operation in the distribution vegetables seeds.
- The establishment of the Department of Parks and Gardens.
- FAO's "Freedom from Hunger" campaign.
- The "Operation Feed Yourself" campaign.
- The "Urban Ring Farm" and "Roadside Schemes."
- The gloomy food situation in the early 1980s.
- The return of Ghanaian refugees from Nigeria.
- Urban food shortage due to repressive government action against rural farmers and urban market women.
- Increasing number of selling points of exotic vegetable crops.

### Discouraging Factors
- Community specialization and the emergence of barter system.
- Pre-colonial European trade in gun and gun flint.
- Trade boom and the employment of the Gas as middlemen.
- Pre-colonial land acquisition for construction of trading posts.
- Colonial land appropriation for administrative expansion.
- Transportation development and the facilitation of trade.
- Growth of export trade and the establishment of ports.
- The movement of political capital from Cape Coast to Accra.
- The 1939 earthquake and the resettlement schemes.
- Cessation of world war 2 and the withdrawal of foreign troops.
- Government residential development to house senior officials.
- Migration to Accra and the increasing supply of housing stock.
- Post-independence rapid industrialization initiative.
- The demolition of traditional and slum areas.
- The development of Tema Township.
- The promotion of state and mass capitalist food production.
wages. The level of urban food inflation of 52.3% in 1980 and 111.2% in 1981 indicates the genuine impoverishment that afflicted Ghanaians in urban centres. According to government-set standards for minimum nutritional requirements, 88% of the employed labour force had an inadequate diet, even if they were single and spent all their wages on food.\(^5\) Rising food inflation led to numerous strikes and protests against the government during the period of 1970-75. There was also a spate of protest and riots by secondary (boarding) school students, largely over food quality.\(^6\) Secondary school authorities sent students home as their budget was exhausted by raging inflation. Some hospitals discharged patients for lack of food or funds to buy food (West Africa, 1981).

The post-independence era also saw the revival of urban cultivation. Co-operative societies were formed by urban cultivators, and vegetable seedling nurseries were set up where the seedlings were graded, packed and distributed to interested buyers such as commercial firms, schools, hotels and university colleges. The U.S. Operation Mission in Ghana also played an important role in the promotion of urban cultivation in Ghana. In the early part of 1961, the Mission imported 23 varieties of assorted exotic seeds from the United States, weighing about 2,000 pounds, which were then tested as to their adaptability and yield (Ghana Farmer, 1961). Those seeds which were suitable for cultivation under conditions in Ghana were ordered in large quantities and distributed to selected small-scale farmers in Accra and other towns. In addition, the Mission technicians were engaged in teaching farmers modern methods of vegetable cultivation. In conjunction with the Department of Social Welfare and Community Development, the Mission demonstrated the preparation of exotic vegetable foods and how they can be incorporated in Ghanaian dishes (Ghana Farmer, 1961). Contacts with the outside world, rapid urbanisation, and

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6 Ghanaian Times (May 17, 1971. pp.1) reported the suspension of 530 students from Ashanti Secondary School for protesting against poor food quality in their school.
rising incomes and education were responsible for local interest in exotic vegetables, and this led to an increase in the cultivation of exotic vegetables and the proliferation of vegetable markets in Accra. Thus, the production of exotic vegetables was no longer geared towards only meeting the demand of the Europeans, but also to the consumption of the local inhabitants. This period also witnessed the introduction of Thai mushroom production in Accra and other towns in Ghana (UNDP, 1996). The sector also received an international boost when in 1965 the government, in collaboration with the Food and Agriculture Organisation (FAO), embarked upon the “Freedom From Hunger” campaign. While in the rural areas the campaign was to increase food production by means of mechanised farming, in the urban centres the campaign focused on backyard farming, and to this effect Accra was used as the pilot area (Ghana Farmer, 1982). The FAO sponsored the program and supplied improved vegetable seeds free-of-charge to gardeners. Between 1974 and 1976 the government encouraged housewives to engage in backyard gardening to supplement foodstuffs purchased from the market. It was at this point that the idea of backyard gardens gained much popularity among urban dwellers in Ghana.

With Ghana’s population growth rate at about 3% and agricultural growth rate at 0%, there was an urgent need to intensify efforts to arrive at a self-sufficient food production. This prompted the government to initiate an agricultural policy to encourage a move toward self-sufficiency. The government’s policy of rapid development of agriculture for self-sufficiency in food and livestock to feed its people was translated into what was known as “Operation Feed Yourself (OFY)”. The OFY program was launched in February 17, 1972 by Major-General D.K. Addo, then Commissioner for Agriculture. The program concentrated on the cultivation of maize, rice, cassava, millet, plantain, yam, groundnut and vegetables in designated zones where agronomic conditions were considered optimum. The OFY doctrine stirred up national awareness and urged the whole population to grow food for themselves. The enthusiasm of individuals, institutions and departments was aroused and a large section of the population showed keen interest in the
program. Farmers, chiefs, schools and hospitals were all encouraged to produce food for themselves (Ministry of Agriculture, 1973). Support for urban agriculture was also shown by the readiness with which chiefs released land for farming and institutions took to backyard gardening (OFY, 1974). Notable institutional participants in the OFY were the Ghana Prisons, the State Farms, the 5th Battalion of Infantry Brigade and the Ga Youth Association (Ghana Handbook, 1975). The development budget for Agriculture for 1974-75 allocated 246 million to achieve the purposes of the OFY. This is the largest budgetary allocation of the period; in comparison, 100 million in 1970-73 and 140 million in the 1973-74 were budgeted for agriculture. The budget paid special attention to the development of feeder roads to ease the problem of transportation of food items to the market, the supply of irrigation facilities to facilitate year round cultivation of vegetables and other crops, the supply of storage depots for farmers' produce and the establishment and management of buffer stocks (OFY, 1974). The overall objectives were to produce as much as possible of Ghana's food needs using all available resources and to reduce a crippling and largely slavish dependence on food imports. Special attention was given to the urban population since it had no significant background in farming. The Greater Accra Regional Agricultural Committee was charged with the responsibility for executing the OFY program in Accra.

Various organizations provided resources to support the OFY program (OFY, 1974). For instance, the Ghana Supply Commission secured import licenses and facilitated the timely supply of planting materials, tools and machinery to local farmers. They were also responsible for the distribution of approximately 22,660 tons of fertilizer in 1972. The Seed Multiplication Division, by 1979, distributed a total of about 2,044 tons of maize seeds towards the program, as well as a total quantity of 3,564 lb. of imported and locally produced vegetable seeds and 27,170 tons of onion, okra, carrot, lettuce, shallot, bean and tomato seedlings. A number of
private companies also imported seeds of exotic crops in 1972 to support the program (Table 3.1).

Ghana Aluminum Products designed and fabricated 30 ton aluminum grain storage silos to help solve the storage problems of maize, rice, millet and sorghum, and 3 ton aluminum storage bins to ease the difficulties of poultry farmers in getting maize and other feed for the poultry during the lean season. They also produced standard insulated and refrigerated aluminum truck bodies for the transportation of frozen meat, fish and fresh vegetables from food producing centers to the consuming centers. The Ghana Food Corporation expanded the production of poultry at Kanda, Accra, from 3,000 to 10,000 birds. It also opened up markets for food and vegetable crops by linking small scale farmers directly to business houses and institutional customers such as the Ghana Police Depot, Express Group Ghana Limited, Ambassador Hotel, Empire Secondary Technical School, the Achimota School and Border Guard Training Depot at Winneba. Shell Ghana Limited also offered to farmers, farm services such as insecticides for the soil (aldrin, dieldrin, gardona, phosdrin) and fungicides for vegetables (dithane M. 45 and kocide 101).

The Ghana Food Distribution Corporation (GFDC) was behind the creation of centers to provide ready markets for farm produce. Under OFY, the GFDC established storage depots at all buying centers to facilitate the collection and haulage of foodstuffs to the consuming centers. For the preservation and storage of such perishable items as fresh vegetables, fish and meat, the Drevici chain of cold stores, which were abandoned after the 1966 coup, were reactivated and commissioned. A GFDC supermarket refrigeration facility, which was completed in Accra, offered a wide variety of frozen foods to housewives in Accra. Similar projects were undertaken in most major urban centers in Ghana. Since its establishment, the GFDC has served the urban population through its food kiosks. The GFDC also conducted a trial test of embarking on door-to-door sales of food and vegetables in residential areas like the
university campuses, housing estates and army barracks. Food kiosks were also set up at work places in the urban areas. In Accra, such work places include the Broadcasting House, the Ministries areas, Burma Camp and the General Post Office.

Table 3.1 Quantity of Exotic Seeds Imported By Private Companies Towards “Operation Feed Yourself” Campaign in 1972

<table>
<thead>
<tr>
<th>Type</th>
<th>Quantity (pounds)</th>
<th>Type</th>
<th>Quantity (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrots</td>
<td>480</td>
<td>Parsley</td>
<td>30</td>
</tr>
<tr>
<td>Beans</td>
<td>780</td>
<td>Parsnip</td>
<td>20</td>
</tr>
<tr>
<td>Onions</td>
<td>1,330</td>
<td>Radish</td>
<td>30</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>30</td>
<td>Spinach</td>
<td>20</td>
</tr>
<tr>
<td>Lettuce</td>
<td>260</td>
<td>Endive</td>
<td>20</td>
</tr>
<tr>
<td>Cabbage</td>
<td>150</td>
<td>Asparagus</td>
<td>10</td>
</tr>
<tr>
<td>Cucumber</td>
<td>105</td>
<td>Chicory</td>
<td>15</td>
</tr>
<tr>
<td>Pepper</td>
<td>210</td>
<td>Corn</td>
<td>500</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>180</td>
<td>Leeks</td>
<td>30</td>
</tr>
<tr>
<td>Okra</td>
<td>190</td>
<td>Peas</td>
<td>300</td>
</tr>
<tr>
<td>Egg plant</td>
<td>110</td>
<td>Kale</td>
<td>20</td>
</tr>
<tr>
<td>Beet</td>
<td>20</td>
<td>Swiss Chard</td>
<td>30</td>
</tr>
<tr>
<td>Watermelon</td>
<td>80</td>
<td>Kohlrabi</td>
<td>30</td>
</tr>
<tr>
<td>Muskmelon</td>
<td>60</td>
<td>Mustard</td>
<td>20</td>
</tr>
<tr>
<td>Celery</td>
<td>20</td>
<td>Total</td>
<td>5,080</td>
</tr>
</tbody>
</table>

To support the OFY program, Mechanical Lloyd, an importing company situated in Ring Road West Industrial area (a site of intensive vegetable cultivation in Accra), imported and assembled garden machines - the “Gilson Ride Mowers” and “Lion Rotary Digger”. The “Gilson Ride Mowers”, which were specifically designed for backyard gardening, allowed users to sit and drive around the garden while the fast cutter blades spin and do the work underneath. Also, there were MF 50 models which offered invaluable services for such repetitive work as drilling pot holes for irrigation and for drainage.

The government's policy of self-reliance also fired the interest of the Ghana Industrial Holding Corporation’s (GIHOC) divisions which process agricultural raw materials. The GIHOC's processing divisions linked local food producers with agro-processing firms, as vegetable farmers who were willing to supply raw materials to the factories were encouraged to do so through special schemes operated by the Vegetable Oil Mills and Cannery Divisions. Vegetable Oil Mills ran schemes for coconut and groundnut farmers. The coconut schemes involved the Mills taking over a farm and maintaining it until some few weeks to harvesting. At harvest time, the farmer received 75% of the proceeds. In some cases, the farmers received cash advances. By 1973, 635 acres of land and 62 farmers were operating under this scheme; 30 of the 62 farmers had received cash advances totaling 6,000 cedis. Under the groundnut program, a loan scheme provided low-interest loans to farmers.

The Cannery Division of GIHOC spent 1.8 million cedis a year to develop farms for groundnuts and other raw materials to supply its factories. It had an admirable detailed inducement program for farmers who sold their produce to them for processing. This included interest-free loans for cultivation, development of farm lands, the provision of extension officers to farmers and the transportation of farmers' produce
from their farms to the factory free of charge. The Cannery Division, in cooperation with the Council for Scientific and Industrial Research (CSIR), planted 715 acres of pineapples in Nsawam (about 25 kilometers from Accra) to supply the cannery with raw materials to produce pineapple juice.

Agri-Cattle Limited, which operated under the management of Japan Motors Trading Company, set up a 4,000 acre farm near Madina, in the periphery of Accra. The firm cultivated maize, cassava and sweet potatoes, as well as reared cattle. This was a commercialization of mixed farming at a corporate level. Mr. Kanaan Kalmoni, the Managing Director of Japan Motors and a Director of Agri-Cattle Limited, revealed that he was motivated to set up the farm because the population is increasing at a very fast rate and “the yawning mouths have to be fed and this is the humble contribution of Agri-Cattle Limited to help supplement the efforts of all farmers in order to feed the teeming population” (MOFA, 1973). The Bibiani Metal Complex also reduced the shortage of agricultural tools whose production had formerly been monopolized by foreign firms. It manufactured a broad spectrum of agricultural tools such as machetes, hoes, tree pruners, felling axes, pick axes, shovel and spades.

To propagate and disseminate information on the OFY and to promote community involvement, the Ghana Broadcasting Corporation (GBC) broadcast a series of programs on urban farming. These included 15-minute programs hosted by officials of the Ministry of Food and Agriculture on themes such as “vegetable growing”, “what are vegetables?”, “shallot growing in Ghana”, “acquisition of land for farming in the Accra area,” “the Youth in Farming”, “Let’s grow some vegetables”, “Goats for food for the millions”, and “Backyard poultry raising".
The first phase of OFY was a great success in Greater Accra as the region exceeded the target in agricultural production. Below is a table of targets set for 1973 and achievements as at 29th July 1973 (Ghana Handbook, 1975).

Table 3.2


<table>
<thead>
<tr>
<th>Crop</th>
<th>Target (acres)</th>
<th>Achieved (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize</td>
<td>26,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Cassava</td>
<td>55,000</td>
<td>45,000</td>
</tr>
<tr>
<td>Vegetables</td>
<td>35,000</td>
<td>41,000</td>
</tr>
<tr>
<td>Groundnuts</td>
<td>2,000</td>
<td>2,500</td>
</tr>
<tr>
<td>Pineapples</td>
<td>8,040</td>
<td>6,500</td>
</tr>
</tbody>
</table>


However, in spite of some initial successes, the OFY program was beset by many problems. According to Col. F.G. Bemasko, then Commissioner for Agriculture;

We still, of course, have a long way to go. In the face of soaring costs of the inputs... we must strive to supply these essential inputs in adequate quantities and at the right time. Our transportation, processing, storage and marketing resources are still far from adequate. Land tenure and farm credit require urgent attention. Our extension services need expansion and improvement...... The third phase of OFY is devoted primarily to these deficient areas. I believe that in spite of all these outstanding problems that we can justifiably be proud of our achievements. Without OFY we would be in a miserable situation and bankrupt in more than one sense. We are undaunted. We shall persevere till victory is won (OFY, 1974).

During the latter part of the 1970s, the government support for OFY, and agriculture in general, waned due to political turmoil and instability facing the government of the Supreme Military Council (SMC). Food shortages and escalating food prices re-emerged. In response to the escalating food prices, most urban workers resorted to protest and strike actions, which further
threatened the political climate. The government of the SMC and the later Armed Forces Ruling Council (AFRC) resorted to the use of harsh repressive measures on protesters in the form of arrest, trials and shootings (Kraus, 1988). The widespread turmoil over food scarcities and rising food prices compelled the government to institute measures to control inflation. They pinned responsibility for the rising food prices and scarcities on Ghanaian market women who dominated retail trade. The SMC, for instance, banned market women from trading essential goods and fish, and shifted that responsibility to designated supermarkets. This led to long queues, emergence of “queue contractors” and the subsequent disappearance of many food items on the urban market (West Africa, 1976).

In May 1977, the government ordered the reduction in price of most domestic staple food and their sale at fixed prices. According to Flt. Lt. Rawlings, the head of the then ruling military government of the AFRC, “most farmers were part of the demoralising process of the former administration and should change for the better. The revolution has no room for evil and selfish practices” (Radio Ghana, 1982). The government imposed mandatory price controls on local food. This was a tactical means to silence the urban revolt against the government. The military were dispatched to enforce this measure as market women were told to sell their food crops at this reduced, fixed price - a price lower than the money they paid to farmers for these food crops - forcing these traders to withdraw their sale of food to the public. Those caught selling above the control price or “hoarding” food items were summarily flogged or caned in public, made to lie in the street and otherwise humiliated (Daily Graphic, July 16 1979. pp.7).

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7 In late 1983, the TUC leadership protested state price increases of 92-254% on maize, rice, sugar and soap.
The army was even sent to the rural food-producing centres to obtain food to be delivered and sold directly to civil servants in the cities. The TUC also registered genuine kenkey producers and monitored the distribution of maize directly from the FDC warehouse to kenkey makers at 15 points in Accra to eliminate maize diversion to intermediate sellers and subsequent markups (West Africa, 1977). In 1978, the Minister of Consumer Affairs organised a system of direct deliveries of 10% of various food items to 300 consumer co-operatives in Accra, allegedly with 250,000 members (West Africa 1978, June 26, pp. 1215). Wage-earners were impoverished by inflation as real minimum wages fell by 55% during 1974-77 and 65% by 1978.

In blind frustration and determined to control rising food prices, the ruling military government, the AFRC, destroyed the largest market in Accra, the Makola market No. 1, the key wholesale and retail market for foodstuffs in Accra. The food situation became even more worse when Nigeria cut off oil shipments to Ghana to protest the AFRC's execution of three former Ghanaian heads of state and four cabinet members; in many rural areas, lack of fuel hampered the transportation of food items to the urban centres. This was further compounded by the scale of the 1982 and 1983 droughts that hit Ghana, drastically reducing output. By 1983, the country required massive food aid from abroad to avert famine and starvation. The drought conditions and associated bush fires destroyed 35-40% of standing food. Prices of foodstuffs soared. The sudden expulsion of 1.1 millionGhanaians from Nigeria also exacerbated the crisis. Severe food shortages and escalating food prices led most urban residents to resort to urban cultivation. The cultivation of food in Ghanaian cities became a very profitable business due to the rising food prices on the market. Some local inhabitants in Accra took to farming on a more permanent basis; some even

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8 This is a traditional food made from fermented corn dough, wrapped in a corn husk and boiled. It is one of the popular foods eaten by Ghanaians.
9 Increases from January 1982 to January 1983 and from January 1993 to April 1983 were, respectively; maize, 100% and 800%; kenkey, 400% and 1000%; cassava, 50% and 250%; gari (poor man's food), 500% and 1165%; yams, 78% and 256%; plantain, 56% and 525% (Kraus, 1988).
resigned from their jobs in the formal sector to engage in vegetable cultivation. A number of refugees who returned from Nigeria also resorted to farming in the cities.

The swing of the Ghanaian economy especially after the implementation of the Structural Adjustment Program in 1983 saw an emerging intriguing relationship between urban cultivation and the housing sector in Accra. A decline in the supply of housing stock due to falling economic growth vis-à-vis a large unmet housing demand, tremendously pushed up rent for existing housing stock resulting in a rush by individual landlords to turn available open spaces and backyards in the inner city into rental units by means of creating extensions to the original building. Backyard gardening was thereby adversely affected as most of these backyards were under all-year round cultivation. On the other hand, under an economic boom scenario, when the housing stock usually picked up, a different form of urban gardening was affected. In this case, gardens located in the urban fringes were adversely affected as vacant plots along the urban fringes, mostly used for cultivation, were encroached upon by more housing development.  

With the establishment of the Department of Parks and Gardens, some areas of Accra were zoned for park and gardening developments. These developments began along transportation routes and these paved the way for the cultivation of exotic vegetables along transportation lines. Roadside agriculture emerged and developed within the city as vegetable cultivation begun to be practised along roadsides, river banks and in utility-rights-of-way. The Department of Parks and Gardens permitted limited vegetable gardens on the fringes of some selected parks such as Labour Park, Old Polo grounds, Cantonment Park, and 37 Military Hospital Park. There was also a proliferation of vegetable selling points (kiosks) situated on major arterial routes and highways as well as high-income residential areas like Airport, Dzowulu, Labone,

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10 This information was derived from a personal communication I had with Mr Offei, Senior Planner with Town and Country Planning Department, Accra, who is also a technical officer with the UNDP-sponsored Accra Planning and Development Program.

11 Personal Communication with Dr. D. E. Sekyi, Director of Parks and Gardens, Accra.
Cantonment and New Achimota, and in and around the major commercial houses like the Union Trading Company (UTC), Kingsway, Glamour Multi-Store and GNTC - all in the heart of Accra. The increased number of selling points of exotic vegetables provided a tremendous boost to urban cultivation in Accra.

The interest of the Ghanaian government in the promotion of urban agriculture can also be seen in two schemes which were outlined in 1988 - the Roadside Farming Scheme and the Urban-Ring Farming Scheme (Ministry of Agriculture, 1988). These schemes were formulated and expected to be implemented within the broad concept of block-farming. Under the Roadside Farming Scheme, areas of both sides of some selected trunk road were to be declared priority development sites for farming. The soils and the ecology of these areas were to determine the crops to be cultivated. The Mechanization Services and Crop Establishment Program was initiated to develop the land at cost to the would-be users. The land owners had the first option of tilling the land (with the development costs to be amortized) before the tenant farmers were invited. The pilot project was expected to cost 6 million cedis in 1987 and 20 million in 1988 (MOFA, 1988). However, the implementation of the Roadside Farming Scheme at the local level was difficult as some municipal authorities were not interested in the scheme and deliberately discouraged it. The second program, the Urban-Ring Farming Scheme, outlined a new farming initiative for southern forest areas of Ghana where minimum tillage schemes had been tried. The program aimed to establish small farms in "rings" around major towns of the southern Ghana. These farms were expected to be efficient enough to prove attractive as a means of family food security. The scheme also aimed to break the land shortage problem by eliminating the need for bush fallow. Farm land, once cleared, was cultivated continuously under the minimum tillage scheme to reduce the problem of soil exhaustion and soil erosion. Thus, soil fertility and food supply problems were simultaneously dealt with. To some extent, the initiative also aimed at solving problems of urban
unemployment by providing jobs for town dwellers on the urban ring farms. The scheme is yet
to commence. The following are the acres to be utilized and serviced for this program for a
period of 20 years;

Table 3.3
Estimates of Area Under Urban Ring Farm Scheme, 20-Year Period.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Area</th>
<th>Food crop area</th>
<th>Tree crop area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>500</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>2</td>
<td>1,000</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>3</td>
<td>2,000</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>4</td>
<td>4,000</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>5-10</td>
<td>8,000</td>
<td>4,000</td>
<td>4,000</td>
</tr>
<tr>
<td>10-20</td>
<td>256,000</td>
<td>128,000</td>
<td>128,000</td>
</tr>
</tbody>
</table>

Source: Ministry of Agriculture, 1988

According to a MOFA report, an Agricultural Rehabilitation Credit for Peasant Farmers
had been established to provide credit line of 13,478,500 to the Denu/Aflao Urban Vegetables
Growers Association (with 68 members) for equipment and seeds. In addition, the Tamale Rice
Growers Association (with 294 members) was granted a credit of 10.4 million cedis (MOFA,
1988). Although these projects were carried out in urban centers outside Accra, they were an
indication of the growing interest of the government in encouraging urban cultivation in Ghana.

Currently, the industry is sustained by both foreign nationals and local Ghanaians. Asians,
Europeans and the Americans have been the traditional patronisers of the industry. The Europeans
and Americans purchase from the local gardeners vegetables such as lettuce, carrots, peas and
cauliflower. Lebanese, Syrians and Indians specifically buy celery, radish, cucumber, and sweet
pepper. Cabbage, carrots, green pepper, tomatoes and onions are bought by both Europeans and
Asians since they form the basic ingredients in their diet. Ghanaians also buy cabbage, lettuce,
green pepper, carrots and cucumber. Ghanaians who patronise the industry on a daily basis are
those who have stayed overseas for a period of time and have thus got accustomed to European or American eating habits.

Another category of Ghanaians who patronise this industry are those who, although having never travelled outside for long periods, live and rub shoulders with the expatriates in the high class residential areas of Tesano, Airport, Dzorwulu, East Legon and New Achimota. Some of them eat these vegetables as a sign of prestige and social status. Others eat them to supplement the local dishes as local dishes do not contain the protein quality they need. The third category of Ghanaians who patronise this industry eat exotic vegetables because, at parties or outings by their neighbours (expatriates), the food served is mostly made of these vegetables. One can conclude with some degree of certainty that the neighbourhood effect as postulated by Hagestrand (1967) in his theory of diffusion is at work here. Hagestrand postulated that an adoption of an innovation - in this case the eating of exotic vegetable - is likely to be higher in the neighbourhood of an adoptor and decrease with increasing distance from an adoptor. For whereas the local patronage of this industry begun with the Gas and the Fantes who first came into contact with the Europeans, today, the patronage cuts across all ethnic barriers. This is partly due to education in the media and the gradual diffusion of styles and tastes through meetings, celebration of funerals, and the interaction among the different ethnic groups as a result of urbanisation and overseas influence.
Chapter Four

LAND-USE DEVELOPMENT AND URBAN FARMING IN ACCRA

The spatial expansion of Accra has largely been associated with uncontrolled, haphazard urban growth and development that enveloped small towns and villages in the urban fringe. A significant feature of the urbanization process in Accra has been the conversion of neighboring peri-urban area and vacant space\(^1\) into built-up areas. Social and economic displacements have accompanied these encroachments, especially in the peripheral communities, where farming constitutes one of their major occupations. Such encroachments have led to a loss of economic sustenance and livelihood for the affected people, especially the urban poor. This chapter takes a critical look at the processes that have shaped the pattern of land use development in Accra, and based on the author's survey results, explores how this in turn has affected food cultivation within the city. This chapter specifically examines the extent to which land management issues such as land delivery, land tenure, land value and land acts have affected the cultivation of urban space in Accra. Finally, the chapter evaluates three urban models, currently being considered by the metropolitan authority for the future expansion of the city, in terms of their potential to protect the present and the future green space in Accra, and, for that matter, making land available for urban cultivation in the metropolis.

\(^1\) Vacant land here means one, unused land not zoned for any particular purpose; two, land which remained vacant due to physical limitations such as wetland, flooding, and slope; three, land parcels held for speculation, and; four, institutional reserves owned by public or semi-public organizations for development as needs arise or funds become available.
4.1 The Effect of Some Land Management Issues on Urban Cultivation in Accra

Land is a basic requirement for any form of investment in the Accra Metropolitan Area, hence a complex commodity of fundamental importance to the people of Accra. The difficulty in gaining access to land for any form of development is a serious problem facing the people, and is proving to be a major impediment to urban cultivation in Accra. This section using the author’s survey results, analyzes various land management issues which pose, in one way or the other, barriers to urban cultivation in the metropolis.

4.1.1 Land Delivery

Available information on urban development policy in Accra suggests that urban land policy has not received the attention that it deserves (EPC, 1994a). The growth of Accra has remained essentially uncontrolled or undirected, leading to haphazard urban sprawl with signs of massive urban agglomeration clearly evident. Open green spaces including vacant lands, often under urban cultivation, have been adversely affected by this uncontrolled expansion. The problem is further compounded by the lack of institutional machinery to monitor land use zoning and implementation in the metropolis.

This lack has created enormous lapses in the control and management of land development in Accra (EPC, 1994b). For instance, although the Town and Country Planning Department prepares land use plans for the city, unfortunately, it has no powers for their implementation. Rather, the Accra Metropolitan Authority (AMA) is the institution responsible for plan implementation. As a political outfit, the AMA’s priorities are in many ways different from the priorities set out in the plans and policies of the Town and Country Planning Department (EPC, 1994a). Consequently, more often than not, plan-making by the Town and Country Planning Department is not related to plan-implementation by the Accra Metropolitan Authority.
LAND DEVELOPMENT PROCESS IN THE ACCRA METROPOLITAN AREA

1. Application for Land Development in AMA

2. Submission to T&CPD for zoning conformity, and approval to land title.

   - Lands Dept. for verification to land title.

   - Ministry of Health for health and sanitation vetting.

   - Senior Building Inspector for inspection.

   - City Engineers for structural vetting.

3. Internal Revenue Dept. for assessment and tax clearance.


5. Survey Department for final plan approval.
The implication of this phenomenon for urban agriculture in Accra is that areas which were clearly zoned for green spaces and metropolitan gardens by the Town and Country Planning Department have ended up being allocated for other uses such as residential and commercial developments by the Accra Metropolitan Authority. This is one of the underlying causes of land conflict in Accra, which has serious detrimental effects on land ownership and urban cultivation in the metropolis.

Another land policy problem relates to the process of land acquisition in Accra. The current process for obtaining a plot of land for any form of development (including farming) is long, complex, and fraught with difficulties. There are considerable delays in perfecting land title as there are six agencies in charge of such responsibility in the AMA (EPC, 1991) as shown in Fig. 4.1. When application is sought for the development of any piece of land, the application is first submitted to the Town and Country Planning Department which is responsible for checking that the proposed development agrees with the existing land zoning. The application is then referred to the Lands Department for verification of the title to the land in question. If the Lands Department is satisfied that the title to the land is in order, the application is then sent back to the Town and Country Planning Department for consideration and approval.

After approval, the plan is sent to the Accra Metropolitan Authority where the application moves from the Senior Building Inspector to the Building Inspector. It is then transferred to the Medical Officer of Health (MOH) who vets the health and sanitary aspects of the plan. The application then makes its way back to the Senior Building Inspector through the Building Inspector. Where necessary, it then goes to the City Engineer who vets the structural aspects of the development. Next, it goes back to the Senior Building Inspector who then forwards it to the Internal Revenue Department for assessment and tax clearance, and later to
the Land Valuation Board for stamp duty. Finally, the Survey Department approves the plan attached to any instrument of conveyance, leases or transfer.

It should be noted that these various agencies operate under different ministries, and given the absence of any coordinating process, the total period of time to perfect land title is inordinately long. In general, the planning process is administratively cumbersome, time consuming and financially demanding. According to a study conducted by the Land Administration Research Center of the University of Science and Technology in Kumasi, this process can take between one to four years (EPC, 1994a).

The implication of this long approval process on urban cultivation is that it creates an opportunity for unholy alliances and distasteful practices as many developers are motivated to bypass the process to undertake developments which do not conform to the approved land use zoning. In most cases, this takes place on vacant or green spaces suitable for food production. Such unauthorized developments lead to the misuse and abuse of, or incompatibility in the use of, urban land. It also encourages a situation where many plots of land in Accra are owned or developed without appropriate registered title. This leads to land disputes and litigation among prospective land users, including urban farmers. About 32% of the gardeners interviewed indicated that they have, at least once, been involved in land disputes or litigation with their neighbors, family members or the public authorities. Out of this proportion, more than 70% indicated that such litigation adversely affected their productivity in terms of the physical reduction of their farm size and farm yields, as well as their motivation to farm. They indicated that the litigation often related to questions of proving title, boundary disputes, encroachments of vested lands and problems arising from the preparation of site plans. The threat posed by land encroachment was behind the decision by about 8% of the gardeners who indicated that their primary reason for cultivating the land is to hold onto the land. Fig. 4.2 shows land areas within the AMA subject to land encroachment and litigation as
Plate 4-1  An urban green space encroached by a newly physical development in the outer city.

Plate 4-2  An urban garden site encroached by institutional development in the outer city.
of 1992. It can be seen that most of these disputed lands area lie in the periphery of AMA, where new developments and land encroachments are frequent phenomena. The problem of land litigation also arises because land ownership is not well documented and registered. In the case of group ownership, there is the problem regarding who has the authority to grant the title or lease to the land. The effect is considerable uncertainty regarding land title or lease, as well as uncertainty regarding the use of land for long-term gardening. A proportion of 23% of the gardeners interviewed indicated that they are discouraged from making further investment in their farming activities as they anticipated that they would be confronted with the problem of land litigation in the near future. Another related problem has to do with land boundaries. Almost 17% of the gardeners claimed that the boundaries of the land they cultivate are not well defined by the owners, making it extremely difficult to know who owns what, who is to be approached for leasing or renting and how much land can be cultivated.

The main cause of this problem is that some landowners have failed to keep proper records of transactions regarding their lands and its boundary limits as they do not have their titles well documented. They merely support their claims of ownership or boundary limits by statutory declarations which, by law, bind only themselves. Subsequent future evidence of superior claims could nullify their declarations which makes land grants by the previous declarants most unsafe, bringing with it its trail of hardships including land disputes and litigation. The result is sometimes double sales - the sale of a piece of land to more than one person by the same chief, the family head or the individual owner. Protracted land litigation often leads to the ban in the use of such land by the court.

There are many cases of land, suitable for farming, being banned from any usage (including farming) pending the resolution of conflicts associated with their use. In Accra, there is a backlog of more than 16,000 cases relating to land conflict (EPC, 1994b). While this phenomenon has legally hampered the accessibility of land for urban gardening, 13% of the
gardeners indicated that the court decision to ban the use of the land until the dispute is settled has also provided them with the opportunity to illegally cultivate such disputed lands. Although such farming practice is presented with enormous risk and insecurity, it does offer temporary relief for gardeners to earn a livelihood. Thus, any court decision to restrict the use of land until the dispute is settled presents a mixed scenario for urban gardeners; on the one hand, it reduces the formal access of land for food cultivation, while on the other hand, it provides opportunity for squatter or informal food cultivation. In most of the litigation cases, the gardeners and their poor families lose the court battle because they cannot afford effective legal representation vis-à-vis their wealthy opponents.

Another significant issue that has influenced the use of land for urban gardening in the AMA has to do with the recent decision by the metropolitan authority to develop vacant infilling plots within some established community estates. Since the late 1980s, the AMA has been contemplating redeveloping low density communities, especially houses and buildings with large open space surrounding them (APDP, 1994). The affected areas include West Ridge, North Ridge, Labone, East Cantonment and Airport Residential areas. This is part of the land-use intensification scheme aimed at reducing costs associated with the delivery of services and generating internal revenue by leasing vacant plots and backyard spaces to prospective real estate developers. This initiative has led to a change in the plot ratios and the spatial organization of some buildings in Accra with the introduction of detached, semi-detached and row houses. Thus, this new initiative in building layouts would, to some large extent, reduce, if not eliminate, space for backyard or front yard gardening in these estate communities and other areas in the inner city. An estimated 2,500 hectares of backyard space and vacant plots have so far been earmarked for development for this purpose (APDP, 1994).

Furthermore, the concept of a land bank is being considered by the AMA. Land banks first require an inventory of all unencumbered prime lands under the ownership of the state
and public corporations. These large tracts of land are then consolidated into a land bank, in this case, to be managed by the AMA to facilitate land supply for the provision of housing within the metropolitan area (APDP, 1994). It is important to note that land supply for other uses such as green spaces, metropolitan parks and gardening is, under this proposal, not seen as priority concerns. The Greater Accra regional government support this move with the argument that the housing shortage in Accra is the main crisis facing the people in the metropolis. In several locations in Accra, expansion in urban gardening has taken the form of deliberate temporary encroachment into both privately or government acquired lands which are being used by gardeners pending their permanent development. Vast amount of such lands are held by the State Housing Corporation, the Military, Atomic Energy Commission and the University of Ghana. Thus, with the land bank policy, lands belonging to these institutions and others such as churches and hospitals, which are often targeted for food cultivation, could be consolidated into a land bank and utilized for residential development.

4.1.2 Land Tenure

In Ghana, three major categories of land ownership are identifiable (EPC, 1994a). These are state lands, stool lands and vested lands. State lands refer to lands acquired by the state under executive instrument in the interest of the public and for public use. The acquisition may be by virtue of a specific enactment and the land is managed by the Lands Commission. The second category, stool lands, are those which are owned by a community. The community is represented by a stool as the acknowledged symbol or identity of the group. Where no symbol or identity of the community is so acknowledged, the ownership is vested in the family, or tribe as the case may be. Title to land, therefore, is traced to this group.

The third category, vested lands, are lands previously belonging to an indigenous community but declared under various executive instruments and acts to be vested in the
State in trust and administered for the benefit of that community. The relevant acts are the Administration of Land Act 1962 (Act 123) Section 7 (1), and the Public Conveyancing Act, 1965 (Act 302), Sections 1 (1) & (2). The state possesses the legal interest in that land as a "trustee" while the indigenous community is left with a beneficial interest as a "beneficiary". This category of land is managed on behalf of the owners by the Lands Commission. Moneys accruing out of the management of such stool lands are paid into the Stool Lands Account. In Accra, the indigenous Ga community holds most of the traditional land in Accra, and these are divided into numerous stool lands each with an elected chief who has the authority to allocate land to families or individuals (by tradition, all members of a stool are entitled to a plot of land). Families and chiefs also sell leasehold interests to other families and persons of non-Ga descent.

With reference to urban gardening in Accra, based on the questionnaire interview, five forms of land tenure or means of land access could be identified. These are privately owned land, leased/rented land, custodian land, squatter land and public land. The survey reveals that one-quarter of the garden plots is privately owned by the cultivators. Three-quarter of these garden plots are located in the inner city (intra-group comparison -Table 4.1). Similarly, in an inter-group comparison, more urban gardeners in the inner city owned the land they cultivate as compared with their counterparts in the outer city (Fig. 4.3). This trend could be explained by the significant number of gardens in the inner city situated in backyards of residential buildings owned by the gardeners. In terms of the security of the land tenure, privately owned land provides the greatest security to urban gardeners compared to other forms of land tenure. This is because the problem of land encroachment or eviction is virtually non-existent in this case. This level of security provides the opportunity for land-owner gardeners to engage in intensive cultivation of high value, income-generating crops.
Fig. 4.3 Land Tenure Types By Location

Source: Author's Field Survey, 1996
The second most common form of land tenure among the urban gardeners is renting or leasing. The survey indicates that about 23% of the urban gardeners either lease or rent the land they cultivate from individual land owners, traditional chiefs, institutions or the metropolitan authority. Renting provides a gardener with official access to the land in return for a share of the income earned from the sale of the garden produce. Such payments are generally seasonal, after the crops are harvested or on monthly basis for the period while the land is under cultivation. The survey reveals that most of these rented garden plots are located in the inner city (Table 4.1 and Fig. 4.3). Rented land, with a contractual agreement, provides a moderate level of land security to the gardeners in that gardeners are normally notified in advance as to when the land will be needed and given sufficient time to harvest their crops without any loss of farm produce. However, with regard to the land leased from the traditional authorities, security to land is achieved to the extent that the local chiefs or the traditional leaders do not sell such lands to real estate agents or that these lands are not appropriated by the state. Finally, under this category, the metropolitan authority also grants leases to private individuals. This is normally a long-term lease, and although most of the land granted under this lease is primarily meant for a purpose other than farming, some of the lease holders decide to use portions for gardening.

The use of public land for gardening is also common. About 22% of the urban gardeners operate under this form of land tenure, where a farmer has official access to land around public facilities such as transmission lines, roadsides, airport, schools, government offices and hospitals in return for the maintenance of these lands. These are public lands under the control of the metropolitan authorities who tolerate gardening without significant hindrance. The decision by the metropolitan authority not to obstruct gardening on such public lands is based on the notion that urban cultivation promotes neighborhood security and environmental cleanliness. The gardeners are expected to keep the land free-of-bushes to
avoid creation of abodes for criminals and reptiles. The gardeners' continue access to the land depends on their continual maintenance of the land. A significant proportion of these lands are in the inner city (Table 4.1). This is because of the vast amount of land utilized for institutional purposes and utility services in the inner city.

Table 4.1

<table>
<thead>
<tr>
<th>Land Tenure</th>
<th>Total Distribution</th>
<th>Spatial Distribution</th>
<th>Inner city</th>
<th>Outer city</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private-owner land</td>
<td>15</td>
<td>11</td>
<td>37%</td>
<td>13%</td>
</tr>
<tr>
<td></td>
<td>25%</td>
<td>73%</td>
<td>27%</td>
<td></td>
</tr>
<tr>
<td>Leased/Rented land</td>
<td>14</td>
<td>8</td>
<td>27%</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>23%</td>
<td>57%</td>
<td>43%</td>
<td></td>
</tr>
<tr>
<td>Squatter land</td>
<td>10</td>
<td>1</td>
<td>3%</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>17%</td>
<td>10%</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>Custodian land</td>
<td>8</td>
<td>1</td>
<td>3%</td>
<td>23%</td>
</tr>
<tr>
<td></td>
<td>13%</td>
<td>13%</td>
<td>88%</td>
<td></td>
</tr>
<tr>
<td>Public land</td>
<td>13</td>
<td>9</td>
<td>30%</td>
<td>13%</td>
</tr>
<tr>
<td></td>
<td>22%</td>
<td>69%</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>60</td>
<td>30</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

First row = actual number of garden plots.
Second row = column percentage (inter-group comparison).
Third row = row percentage (intra-group comparison).

Source: Author's Field Survey, 1996
The level of security offered by this type of land tenure is relatively high compared with others, except privately owned land. This is because utility lands (roadsides, transmission lines or airports) are areas devoid of any physical development or possible encroachment. However, this level of security could breakdown any time there is a change in the metropolitan policy regarding the appropriateness of farming such public lands. Another notable form of land tenure is the custodian arrangement; an informal arrangement between an absentee or speculative land owner and an urban gardener. The gardener is entrusted with the land as a caretaker and s(he) is assured that, even if future use-right is withdrawn, s(he) will not be subject to summary eviction but given sufficient time to harvest his/her crops. Under such an arrangement, the use of the land is absolutely free of cost to the gardener but serves the interest of the land owner as s(he) is assured of having the land back without litigation. Such an arrangement also prevents squatters from taking up permanent residence on the land.

It is the responsibility of the gardener to keep the land clean to save the land owner from being prosecuted by the Accra’s Sanitation Task Force. Section 18 of the 1989 AMA by-law, requires owners or occupants of any land to maintain such land and keep the roads, street or paths adjoining this land free from bushes. Under this arrangement, the custodian gardener is expected to perform these tasks on behalf of the absentee land owner. About 13% of the urban gardeners interviewed indicated that they procured access to the use of the land through custodian arrangement. Most of the custodian lands are located in the outer city where there are greater concentrations of speculative lands. This form of land arrangement presents some insecurity to the urban gardeners as the duration of the land use is quite unknown and gardeners could be asked to vacate the land anytime. Also, by their speculative nature, such lands are often subject to serious litigation from double sales, jeopardizing the security of the land for gardening.
The final form of land available for gardening is squatter lands. These are un-sanctioned lands whereby gardening occurs without the consent of the land owner. Such a land owner could be the public authority or a private individual. Under this scenario, gardening on these lands is illegal or not permitted by the metropolitan zoning regulation. Inhabitants of squatter settlements take advantage of their occupation of such land to illegally farm their surroundings without the consent of the land owner or the metropolitan authority. About 17% of the gardeners surveyed acquired the use of their garden plots through this means. Most of these garden plots are located in the outer city where the land is under constant encroachment by squatter settlements. A significant cause of the emergence of squatter gardening in Accra stems from the failure of land zoning regulation to formally allocate land for urban farming and other informal sector activities. This form of land tenure is the least secure as gardeners are constantly being harassed, intimidated or evicted, and sometimes their garden produce destroyed by the officials of the Sanitation Task Force, the land owner or the families of the absentee land owner. It is no surprise that most of the squatter gardeners indicated that land encroachment and official harassment constitute the leading problems confronting them.

In the overall distribution, the most dominant form of land tenure among urban gardeners is inner-city private land-ownership, followed by inner-city public land, outer-city squatter land, inner-city renting/leasing, and outer-city custodian arrangement. The least represented are inner city squatter land and inner city custodian arrangement. Within the inner city, land ownership (37%) is the dominant form of land tenure, and this is followed in a descending order by public land (30%), renting/leasing (27%), custodian (3%) and squatter land (3%); while the dominant form of land tenure in the outer city follows the reverse direction. Based on the survey of urban gardeners, extension officers and an official of the Ghana Real Estate Development Association (GREDA), privately owned land is found to be the most secure form of land tenure for urban cultivation, followed in a descending order by public land,
leased/rented land, custodian land and squatter land. Based on this trend, one can conclude that lands which are more secure for urban gardening are located in the inner city while the less secure lands are concentrated in the outer city. One can also suggest that land tenure in Accra relates to land security, as the major distinction among these land tenure types is the level of security associated with each of them (refer to Table 4.2). For the sake of simplicity, gardeners who cultivate land they own will be referred to as “land-owner gardeners”, those that cultivate rented or leased lands will be called “tenant gardeners”, those under custodian arrangement will be termed “custodian gardeners”, those that cultivate public lands will be termed “utility gardeners” and finally, “squatter gardeners” will be used to refer to those that cultivate squatter lands.

The level of security offered by any particular land tenure conditions a gardener’s motive of cultivation, the type of crops to cultivate and the production method to use. Table 4.2 provides a matrix which portrays some dominant gardening characteristics associated with the various forms of land tenure in Accra. The more secure a land tenure is, the greater is the likelihood that the gardener will invest in the improvement of such land in the forms of organic or fertilizer application, pests and insects management, soil erosion control, soil moisture retention measures and flood checks. Thus, land tenure which provides greater security provides greater incentive for the improvement and effective management of the land. Thus, privately owned land (backyard space) and public land (utility land), which offer the most secure form of land tenure for urban gardening, tend to attract more improved farming and land management techniques. On the other hand, gardeners have less incentive to improve and manage squatter or custodian lands.
### Table 4.2

**Land Tenure Forms and the Dominant Gardening Characteristics.**

<table>
<thead>
<tr>
<th>Security</th>
<th>Land tenure</th>
<th>Location</th>
<th>Site</th>
<th>Motive</th>
<th>Crop type</th>
<th>Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high</td>
<td>land ownership</td>
<td>inner city</td>
<td>backyard</td>
<td>income</td>
<td>indigenous</td>
<td>moderate</td>
</tr>
<tr>
<td>High</td>
<td>public land</td>
<td>inner city</td>
<td>utility land</td>
<td>income</td>
<td>exotic</td>
<td>very high</td>
</tr>
<tr>
<td>Moderate</td>
<td>leased/rented land</td>
<td>mixed</td>
<td>stool land</td>
<td>income</td>
<td>exotic</td>
<td>high</td>
</tr>
<tr>
<td>Low</td>
<td>custodian land</td>
<td>outer city</td>
<td>absentee land</td>
<td>subsistence</td>
<td>indigenous</td>
<td>low</td>
</tr>
<tr>
<td>Very low</td>
<td>squatter land</td>
<td>outer city</td>
<td>vacant plot</td>
<td>subsistence</td>
<td>indigenous</td>
<td>very low</td>
</tr>
</tbody>
</table>

Source: Based on the Author’s Field Survey, 1996.
Fig. 4.4 Reasons For Gardening By Land Tenure

Source: Author's Field Survey, 1996
Additionally, gardeners with more secure land tenure (land-owner and utility gardeners) tend to cultivate primarily for income or income supplement (market gardening) while gardeners with less secure land tenure (custodian and squatter lands) tend to cultivate mainly for home consumption or to save money (kitchen gardening) as shown in Fig.4.4 and Table 4.3. Thus, the survey indicates that 67% of the land-owner gardeners cultivate for income purposes while only about 27% cultivate for household consumption. Also, about 54% of the utility gardeners engaged in gardening for the purpose of generating income while only 23% did so for home consumption. In contrast, 50% and 40% of the custodian and squatter gardeners, respectively, cultivate mainly for home consumption while only 38% and 30% respectively cultivate for income. For inter-group comparison, of all those who cultivate for income, 32% are land-owner gardeners, 26% are tenant gardeners, 23% are utility gardeners, 10% are custodian gardeners and 10% are squatter gardeners. On the other hand, of all the gardeners who cultivate for home consumption, 25% are tenant gardeners, 20% are custodian gardeners, 20% are squatter gardeners, 20% are land-owner gardeners and 15% are utility gardeners. The above trends support the assumption that the more secure a land tenure is the more likely will urban gardeners cultivate it for income. In contrast, the less secure a land tenure is the more likely will urban gardeners cultivate it for food. This is because the high security associated with the use of privately owned lands and utility lands for food cultivation provides gardeners with the incentive to invest in the cultivation of high value, income generating crops, which is supported by considerable investment in improved production and marketing technologies. Thus, it only becomes worthwhile for a gardener to invest in the intensive cultivation of high value, income-generating crops only if s(he) knows that the land s(he) cultivates is secure enough to enable him/her to produce without harassment, encroachment or eviction.
Fig. 4.5  Land Tenure Types By Crop Types

Source: Author's Field Survey, 1996
Table 4.3
Land Tenure Types and Principal Reason For Urban Gardening
Cross Tabulation (%)

<table>
<thead>
<tr>
<th>Land Tenure</th>
<th>Food</th>
<th>Income</th>
<th>Income suppl.</th>
<th>Save money</th>
<th>Hobby</th>
<th>Hold on land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Ownership</td>
<td>7</td>
<td>47</td>
<td>20</td>
<td>20</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Leasing/renting</td>
<td>29</td>
<td>21</td>
<td>29</td>
<td>14</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Custodian</td>
<td>38</td>
<td>38</td>
<td>0</td>
<td>12</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>Squatter land</td>
<td>30</td>
<td>20</td>
<td>20</td>
<td>0</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Public land</td>
<td>15</td>
<td>46</td>
<td>8</td>
<td>8</td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>35</td>
<td>17</td>
<td>12</td>
<td>7</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Author's Field Survey, 1996

The type of land tenure facing an urban gardener also influences his/her decision on the type of crop to grow. Although indigenous crops and exotic vegetables could both generate income for the gardeners, the cultivation of exotic vegetable is far more lucrative than indigenous crops, making the cultivation of exotic vegetable the target of those who cultivate purely for income (the land-owner and utility gardeners). The cost of cultivating exotic crops is relatively expensive; hence, greater land security is needed to encourage the gardener to invest in such a venture without the fear of being evicted, harassed or their crop being destroyed - a situation which could pose a significant financial loss to them. This explains why cultivators of high value, marketable exotic crops are mostly utility or tenant gardeners who have more secure lands (Fig. 4.5). In contrast, cultivators with less secure lands (squatter and
Plate 4.3 Urban cultivation at a site of an abandoned building in the inner city.

Plate 4.4 A land dispute site under maize cultivation in the urban periphery.
custodian gardeners) tend to cultivate less valuable, indigenous crops as financial damage will be minimal, in the event of eviction, harassment and intimidation. Table 4.4 shows that about 41% and 25% of the exotic crop cultivators are tenant gardeners and utility gardeners, respectively, while relatively, only 9% and 6% are squatter and custodian gardeners.

With respect to gardeners who grow indigenous crops, interestingly, most of them cultivate lands they personally owned (32%), followed in a descending order by gardeners who cultivate squatter lands (25%), custodian lands (21%), utility lands (8%) and rented/leased land (2%). Thus, the expected assumption that the more secure a land tenure the greater is the possibility and incentive there is for the cultivation of high value, exotic crops was not seen in the case of the land-owner gardeners. This could be due to the considerable number of the land-owner gardeners who cultivate backyard space and who are involved in gardening to achieve the multiple objectives of producing food for the household kitchen and for the market\(^2\). Hence, the cultivation of indigenous crops is the appropriate choice of meeting both these objectives without committing much in the way of resources and time. Most of these land-owner gardeners cultivate backyard spaces in close proximity to their kitchen, and also work full time. Thus, time is a constraining factor in their ability to intensively cultivate time-demanding exotic crops.

Similarly, tenant gardeners cultivate more exotic crops than indigenous crops, and more so than the much more secure utility gardeners. The domination of the tenant gardeners as growers of exotic vegetables could be explained by two factors; one, tenant gardeners are more likely to cultivate income-generating exotic crops which, being more lucrative, could easily pay for the cost of the land and; two, tenant gardeners are more sensitive to land value, hence often responding to the increasing cost of land by reducing the size of their plots, a situation which could viably support the cultivation of exotic crops and not indigenous crops.

\(^2\) In most situations, gardeners do not consume exotic vegetables but sell them on the market for income.
Thus, a small-size garden plot lends itself easily to the cultivation of exotic crops, which require less space as compared with the cultivation of indigenous crops. In spite of this contradiction, a chi-square test of goodness-of-fit reveals a strong statistical association between the various forms of land tenure and the type of crops grown (refer to Table 4.4).

Table 4.4

Type of Land Tenure and Type of Crop Cultivated
Cross Tabulation (%)

<table>
<thead>
<tr>
<th>Land Tenure</th>
<th>Exotic vegetables (intensive cultivation)</th>
<th>Indigenous crop (extensive cultivation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Privately-owned land</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>19%</td>
<td>32%</td>
</tr>
<tr>
<td>Leased/Rented land</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>41%</td>
<td>4%</td>
</tr>
<tr>
<td>Custodian land</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>6%</td>
<td>21%</td>
</tr>
<tr>
<td>Squatter land</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>9%</td>
<td>25%</td>
</tr>
<tr>
<td>Public land</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>25%</td>
<td>18%</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>53%</td>
<td>47%</td>
</tr>
</tbody>
</table>

Chi-square = 14.97  
*p = 0.004  
df = 4

First row = actual number of garden plots
Second row = column percentage (inter-group comparison)

Source: Author's Field Survey, 1996

Thus, a chi-square value of 15 (*p* = 0.004) indicates strong relationship between the form of land tenure facing an urban gardener and the type of crop he/she grows, which goes to support the hypothesis that there is a statistical relationship between these two categorical attributes - that is, the more secure a land tenure the likelihood of it being used for income-
generating crop production (exotic crops), and the less secure a land tenure is the likelihood of it be used for subsistence cultivation (indigenous crops).

Table 4.5

<table>
<thead>
<tr>
<th>Reason</th>
<th>Exotic crop</th>
<th>Indigenous crop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>39%</td>
<td>62%</td>
</tr>
<tr>
<td></td>
<td>16%</td>
<td>29%</td>
</tr>
<tr>
<td>Income</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>76%</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>50%</td>
<td>13%</td>
</tr>
<tr>
<td>Income supplement</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>80%</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>25%</td>
<td>7%</td>
</tr>
<tr>
<td>Save money</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>14%</td>
<td>86%</td>
</tr>
<tr>
<td></td>
<td>3%</td>
<td>21%</td>
</tr>
<tr>
<td>Hobby</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>25%</td>
<td>75%</td>
</tr>
<tr>
<td></td>
<td>3%</td>
<td>11%</td>
</tr>
<tr>
<td>Hold on land</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td></td>
<td>3%</td>
<td>14%</td>
</tr>
<tr>
<td>Total</td>
<td>53%</td>
<td>47%</td>
</tr>
</tbody>
</table>

Chi-square value = 16.23       df = 5     p = 0.006 (SL)

First row = actual count
Second row = row percentage
Third row = column percentage

Source: Author’s Field Survey, 1996
Similarly, a chi-square test on the relationship (Table 4.5) between the type of crop cultivated and the reason for cultivation also reveals a value of 16.23 at 0.0% significance level, which indicates a significant statistical association or inter-dependency between these two variables. Thus, this conclusion supports the research hypothesis that urban gardeners who cultivate primarily for income (land-owner and utility gardeners) are more likely to cultivate exotic vegetables, while those that cultivate mainly indigenous crops (squatter and custodian gardeners) do so mainly for direct household consumption.

Proximity to transportation route and market also significantly influence gardeners' decision on the type of crops to cultivate. This decision can be seen in the light of the Thunen's (1966) concept of location of agricultural practices which postulated that agriculture produce cultivated at greater distances from the city should be those that would cost less to be transported in relation to their value. On the other hand, Thunen postulated that a perishable produce should be cultivated closer to the city (the market center) for easy access to transportation and market. His assertion can be seen in operation in Accra, where highly perishable crops such as exotic vegetables are produced within the metropolis to take advantages of the closeness to market and transportation routes. For instance, the survey reveals that 59% of the exotic crop production is located in the inner city, or 63% of the inner city gardeners produce exotic crops. Thus, exotic crops are more likely to be grown in the inner city (potential market source) or along transportation networks (easy transportation) for the reason that most are perishable and preferred by consumers in a fresh state. In the urban periphery, 57% of the gardeners produced indigenous crops; or 61% of the indigenous crop production is located in the outer city. The concentration of the cultivation of indigenous crops in the outer city could thus be explained by the fact that such crops are relatively less perishable and they could be stored for long without the problem of deterioration. Indigenous crops like maize, cassava and okra have witnessed a long tradition of indigenous style of
preservation and storage, making the proximity of their cultivation to market source and transportation lines not urgent factors.

Another significant characteristic is that, the more the secure the land tenure, the greater the chances of urban gardeners employing intensive methods of cultivation. This findings is statistically supported by a chi-square vale of 14.97 at 0.004 level of significance (refer to Table 4.4). Thus, gardeners who cultivate the more secure land are motivated to employ more improved, intensive forms of cultivation as they rely heavily on the use of organic manure, chemical fertilizers, improved seeds/seedlings, pesticides and theft security and irrigation facilities to produce high value, income generating exotic crops. This high investment is made possible by the fact that the more a farm land is securely held, the more credit is made available by loan granting agencies to finance the operation of the farm. Furthermore, the cultivation of exotic crops, which are mostly cultivated on secure land, lend themselves easily to intensive cultivation. Thus, the more secure a land the more viable is it to cultivate exotic crops, which require less used of land, and intensive application of improved production method. Thus, gardeners with less secure land tenure and who cultivate low value, indigenous crops found it more risky and unviable to allocate funds into their farming venture or employ improved method of cultivation. They are more likely to invest in extensive cultivation, which is characterized by low-budget cultivation of indigenous crops with simple garden tools.

Overall, one can conclude that the form of land tenure facing an urban gardener, to a large extent, influences the extent to which a garden plot is managed, and a gardener decision on why to produce, what to produce and how to produce. These are somewhat inter-related. For instance, a utility gardener will be encouraged by the high security offered by his/her land to cultivate primarily for income. To be able to cultivate for income, he has to produce income-generating crops such as exotic vegetables which are very marketable and are in high demand in Accra. Finally, to be able to produce high quality, marketable vegetables, he has to invest in
intensive methods of production which requires him to rely on the use of organic manure, chemical fertilizers, pesticides, hybrids seeds or improved seedlings, and irrigation.

Another land tenure issue which is affecting urban gardening in Accra has to do with the changes to the amount of land controlled by the major supply agencies - chiefs (stool), government and families. The most important agency, based on the amount of land under its control, has moved from the chiefs and/or families to the state. Acquaye and Associates (1989) indicated that the mass acquisition of land by the state for its development functions since the colonial era has led to a substantial amount of land shifting from the chiefs to the state, making the state a dominant land holder in Accra. For instance, in 1989, there were an estimated 14,763 hectares of land within the metropolitan area held by the state which represents 67% of the total land area of Accra while the traditional authority controls only about 2,462 hectares (11%) of the statutory planning area of Accra (Acquaye and Associates, 1989). The diminishing stool land under the control of the traditional authorities poses a serious problem of land accessibility for urban cultivation in Accra. Traditional lands, customarily, are perceived to belong to the past, present and the future generations; consequently, permanent development of the land is often not allowed but temporary uses are permitted by the local chiefs. Farming is one of the temporary uses often allowed on traditional lands.3 Hence, any acquisition of traditional lands by the state would likely restrict land available for gardening as state-acquired lands are often allocated for permanent development such as residential and institutional uses. Thus, land previously under urban cultivation, more often than not, is converted to physical permanent development the moment its’ ownership changed from the traditional authorities to that of the state.

Thus, state acquisition of land in the name of public interest represents one of the most important source of farmers’ displacement within the Accra Metropolitan Area. Land used

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3 Ghana Real Estate Development Association (GREDA). Personal Communication.
in the public interest in Ghana is acquired under two major government Acts - Act 123 in respect of stool lands and Act 125 in respect of family or private individual holdings. In all documented cases of such acquisitions, compensation was paid usually after protracted procedures, to affected stools, families or private individuals for loss of land, crops and other properties. For example, in 1968, the state acquired a stool land holding for the construction of the West African Secondary School in Accra. The total area of agricultural land lost by the various farmers was 80.83 hectares. While about 150 farming families were displaced by the acquisition, only 21 families were compensated for crops lost (Kufogbe, 1988). In a similar acquisition of 115.7 hectares of land in Madina for the construction of the building for the Department of Social Welfare and Community Development in 1977, the Labadi stool claimed compensation, but only 26 of the 166 of the displaced farmers were compensated for crops lost. A serious lapse in connection with most state acquired lands, from a land management point of view, is that acquisition of most stool lands and their subsequent development were not preceded by any land capability surveys. The seriousness of this lapse, from the point of view of agriculture, was pointed out by Amartefio et al (1966) who criticized the government acquisition of 16,187.78 hectares of land in 1951 in Tema for the location of the Valco Smelter. This vast area of land was an agriculturally fertile area, known for the cultivation of vegetables. The agricultural capability survey which was to have preceded the demarcation and allocation of the Valco Smelter came hurriedly in 1958, too late for the findings to be meaningfully implemented. In addition to the role of the state acquisition in reducing stool lands available for food cultivation, some private real estate agents have also successfully convinced some family heads or local chiefs to sell parcels of their community or stool lands for residential development. Although the traditional right to the land is communal and chiefs or family heads are customarily forbidden to sell such land, some, stubbornly, are unwilling to allocate lands for their community members for temporary uses, but are interested in selling these lands to real
estate agents or developers. This is because the lucrative enticement from the real estate agencies far exceeds what the stool chiefs or family heads will get from temporary use of the land by their community members. Without scruple, many of the local chiefs sell out stool lands to private interests for non-conforming uses. Thus, the unscrupulous behavior of the real estate agencies, combined with the selfish motive on the part of the local chiefs have led to stool land, which permits community gardening, to give way to private land ownership which utilizes such lands mostly for the construction of residential buildings.

4.1.3 Land Value

Since urban agriculture takes place on metropolitan land, any imposition of value, or changes in the value of the metropolitan land, is likely to have an impact on farming in the metropolis. In Accra, the changes in the value of urban land have significantly influenced urban farming by evoking a series of responses and adaptations from the local gardeners. The purpose of this section is to explore how the local gardeners in Accra respond to the rising cost of urban land in Accra, and the extent to which the spatial variation in land value in Accra is reflected in the configuration of urban gardening in the metropolis. While this analysis will be more applicable to tenant gardeners, admittedly, renting of land for urban gardening purposes is not the dominant form of land tenure among gardeners in Accra. However, it is essential to explore the relationship between urban land value and urban cultivation in order to assess the responses and the future potentials of the sector in the face of mounting land pressure in the metropolis.

Asabere (1981) noted that the price of land in Accra is significantly influenced by the distance from the CBD, the presence of major roads, government zoning, land tenure, ethnic clustering and the probability of land being put into other uses. In all cases, the interplay of the

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4 Regimanuel Real Estate Developers. Personal Communication.
market forces of demand and supply of land has remained the strongest determinant of the value of land in Accra, as generally postulated in classical rent theory. In Accra, the Ministry of Local Government estimated that the Lands Commission is currently allocating less than 300 plots per year while the estimated demand for plots from stool, family and individual is about 1,500 (APDP, 1992). It is obvious that, in Accra, the demand for urban land far exceeds its supply, creating a land shortage and an upsurge in the prices of land and rental property. The field survey reveals that urban gardeners in Accra are seriously concerned about the rising cost of urban land and have acknowledged the restriction it could impose on their ability to access and use land for gardening. They indicated that, over the years, they have employed varying strategies in response to increasing pressure on land. The nature of their adjustment is dependent on how secure the land is, how profitable is their gardening activity, the extent to which land is available in adjacent areas, the motive for cultivation and the flexibility of adjusting or relocating.

A notable response has been a change from extensive to intensive gardening as indicated by about 37% of gardeners. Although gardeners under the various forms of land tenure employ this mechanism when facing strong land pressure, this strategy is largely employed by tenant gardeners who are concerned about the extent to which the rising land cost could affect the profitability of their commercial operation. According to these gardeners, it is more profitable to cultivate lesser space by reducing the size of their gardens while increasing the use of organic manure, pesticides and improved seeds. They suggested that the nature of their crop (mostly exotic vegetables) is such that they can easily be cultivated intensively on smaller space without a loss to net revenue. Furthermore, the marketability of exotic vegetables hinges on the quality of the produce rather than quantity. As a result,

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5 According to the Ministry of Local Government, in order to stabilize the land market, supply of urban land would need to increase by a 3,000 plots per annum; and by the year 2000 this figure will need to increase to 5,000 (APDP, 1992).
gardeners are interested in improving the quality of their produce by concentrating on small
garden plots but employing improved and efficient production methods. They therefore
respond to a slight increase in the cost of rented plot by reducing the size placed under
cultivation. However, a rather contrasting strategy is pursued by about 22% of the gardeners,
all located in the outer city, who resorted to more extensive cultivation of peri-urban space in
the face of intense land pressure. For this group of gardeners, the urge to cultivate more
space becomes compelling as, with the rising cost of urban land and, in particular, with the
increasing encroachment on peri-urban lands, they are pushed further away onto parts of
outer city lands which are less fertile. To compensate for the lost productivity (lower yield per
area) associated with the low soil fertility of their new gardening area, they resort to the
cultivation of more space which is readily available in the urban periphery. Their decision to
embark upon extensive cultivation is also supported by agronomic factors (such as plant
spacing) which allow for more land space for any increased production of indigenous crops (for
example, maize), which are the dominant crops grown in the outer city.

Some landlords increase land rent during the wet season when gardeners enjoy a good
harvest. About 26% of the market gardeners indicated that they transfer any increase in the
cost of the garden plot onto the price of their garden produce. They indicated that this strategy
is proving to be more effective in that most of their customers are affluent members of the
community who are less sensitive to a slight increase in the price of exotic vegetables. Thus, in
economic terms, one can describe the relationship between the price of exotic vegetables and
the demand from the affluent society as that of inelastic demand.

Information derived from the GREDA also reveals that a considerable number of land-
owner gardeners respond to the increasing cost of land and accommodation by using available
spaces surrounding their houses to construct extensions or boys quarters to the main building.
Even toilet-rooms and bath-rooms are often converted to bedrooms to be rented out to
prospective tenants. Some land-owner gardeners perceived the use of their land for backyard gardening to be less economically rewarding compared with the potential earnings to be derived from renting a room built on the backyard space. Thus, often driven by maximizing earnings from the use of their land, some land-owner gardeners respond to the rising cost of land and accommodation by converting their backyard space which is used for food cultivation into residential structures to provide shelter to meet the rising needs of housing. Even in a situation where the land owner is not in a position to finance such building extension, prospective tenants often provide the financial assistance to the landowner by paying 5-10 years rent in advance. In other situations, based on a specific agreement, the landlord could sell such backyard space to the prospective tenant or the real estate developer for residential development. Thus, it could be said that the process of converting garden plots to residential uses is often triggered when the demand for the land pushes the price beyond the farming value. The effect of this response has been a decrease in the land space for backyard or front yard gardening. Furthermore, some low-income residents respond to increasing land value by relocating to the urban periphery to the more affordable informal settlements, where, by ignoring official building codes, housing costs could be lowered and land becomes less expensive. That is, the increase in urban land value has driven some low-income residents to leave in search of low value land in the urban periphery. Unfortunately, the majority of these relocations are taking place on fertile, agricultural lands on the edge of city.

Land speculation has also contributed significantly to land value dynamism in Accra. A leading factor in the speculation of the peri-urban land has been the assumption that all such land will command higher prices in the future mainly due to the expansion of the urban agglomeration. Hence, it is considered a good investment by both the farm and non-farm population in Accra to possess land. Furthermore, land acquisition carries a mark of social prestige as one may be a pauper but the possession of plots may elevate his social status.
These expectations have led to the excessive activity on the part of land buyers, and this has caused land prices to rise to an extremely high level. The practice of individuals holding land for long periods of time without developing such land has created an artificial shortage of land and limited the accessibility of land for any form of development including urban gardening. Speculation affects farmland prices even if no possibility of its conversion to non-farm uses is foreseen. Some land-owner gardeners respond to the rising land price by selling their land in the inner city and buying cheaper land in the outer city. However, a paradoxical phenomenon associated with land speculation is that, in the face of an apparent shortage of land for any form of development, there are a large number of sites, some quite sizable, which remain undeveloped by individuals and institutions. In Accra, mention can be made of parcels of land granted to institutions like State Housing Corporation, State Insurance Corporation and the Bank for Housing and Construction which are yet to be developed. In 1992, there were more than 4,000 plots with absentee ownership in the AMA and a further 6,880 with incomplete structures (APDP, 1992). Whereas land speculation may present an initial problem of limiting land access for gardening, under a situation where such speculative land remains undeveloped, a favorable condition exists for gardeners to utilize such undeveloped, speculative lands for farming pending their future development. Urban gardeners sometimes cultivate these land without the consent of the owners (squatter gardening). In some cases, based on custodian agreement, land owners allow for the use of such speculative land for farming (custodian gardening) as a means of keeping away potential intrusions by squatter settlements or illegal encroachment by other land developers.

Whereas the value of land in Accra has been increasing tremendously over the years, the value of urban land differs markedly from one place to another. Such spatial variation of land value in Accra has significant implications for urban cultivation in terms of the preponderance of urban gardens. Statistical data from the Land Valuation Board confirms the
general land use theoretical assumption by Alonso (1960) that land value increases towards the CBD from the urban periphery. For instance, in 1980, land values in Accra decrease sharply from 77,500 per acre in the CBD to about 2,000 per acre at the suburbs (APDP, 1992). The table below (Table 4.6) provides an insight into the relationship between land value and distance from the CBD in Accra in 1988.

**Table 4.6**

**Relationship Between Distance From CBD and Land Value in Accra, 1988**

<table>
<thead>
<tr>
<th>Location</th>
<th>Dist. from CBD (km)</th>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airport</td>
<td>9-10</td>
<td>100 x 100 feet</td>
<td>5 million</td>
</tr>
<tr>
<td>East Legon</td>
<td>11-12</td>
<td>100 x 100 feet</td>
<td>4 million</td>
</tr>
<tr>
<td>Legon</td>
<td>14-15</td>
<td>100 x 100 feet</td>
<td>3 million</td>
</tr>
<tr>
<td>Kwabeng</td>
<td>14-15</td>
<td>100 x 100 feet</td>
<td>2 million</td>
</tr>
<tr>
<td>Madina</td>
<td>15-18</td>
<td>100 x 100 feet</td>
<td>600,000</td>
</tr>
<tr>
<td>Adenta</td>
<td>18-19</td>
<td>100 x 100 feet</td>
<td>600,000</td>
</tr>
<tr>
<td>Ashalebotwe</td>
<td>20-23</td>
<td>100 x 100 feet</td>
<td>400,000</td>
</tr>
<tr>
<td>Barrier</td>
<td>20-23</td>
<td>100 x 100 feet</td>
<td>300,000</td>
</tr>
<tr>
<td>Oyarefa</td>
<td>24-31</td>
<td>100 x 100 feet</td>
<td>150,000</td>
</tr>
</tbody>
</table>


The spatial variation of land values in Accra has influenced the configuration and the preponderance of urban farming in Accra. A reconnaissance survey of land use patterns along the Accra-Legon road shows that the frequency of urban land under farming, generally, increased away from the CBD of Accra to the periphery, while conversely, the frequencies of residential, industrial and commercial land uses decreased from the CBD to the periphery. This

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6 A gradient analysis by Nikoi (1974) also indicated that for every one foot distance north, north-westwards from the CBD there is a decrease of land value by 5.17 cedis.
Fig. 4.6: Distribution of Mean Land Values and Garden Plots in Accra, 1996

Sources: Land Valuation Board (Land Value Map) Extension Services, Accra District (Garden Location Map)
is due to the conversion of vacant or garden plots into residential uses in response to the rising urban land value. The overall impact of this response is a reduction in the preponderance of garden plots with decreasing distance from the CBD. Fig. 4.6 shows a land value map of Accra (derived from Land Valuation Board) superimposed on a garden location map (excluding backyard gardens) of Accra (derived from MOFA, Accra District Extension Office). The map reveals a preponderance of garden plots in low land value areas such as Burma Camp, Labadi, Abose Okai and Lartebiokorshie whereas areas with high land values such as the CBD, Roman Ridge and Victoriaborg have small number of urban garden locations. Although this is not clearly evident on the map, a careful look reveals an increasing frequency of urban gardens with increasing distance away from the CBD. In an unpublished report, Kufogbe (1988) provides a more detailed statistical support to the spatial configuration of urban farming vis-a-vis the spatial variation of land value along the Airport-Ayimensah transect in Accra (Fig.4.7). In a correlation analysis, which examines the relationship between the frequency of various urban land uses and distance from the CBD, Kufogbe (1988) reported a positive correlation of 0.771 between agricultural land use and distance from the city of Accra; in contrast, residential, commercial and industrial land uses have a highly negative correlation of -0.431, -0.502 and -0.357, respectively. In an actual count along the Airport-Ayimensah transect, Kufogbe observed that in the inner zone, the residential uses were the dominant type of land use and accounted for 51% of the total number of 89 plots for the sub-zone, followed by agricultural (16%) and mixed uses (16%), while there was a conspicuous absence of vacant plots. In the outer zone, agriculture was the dominant category of land use with 74% of the land under farming, mixed uses accounted for 16% and residential uses 8%. Thus, in response to the decreasing value of urban land from the inner city towards the urban periphery in Accra, urban gardening has also increased in frequency from the inner city towards the urban periphery.
However, there are two exceptions to the above assertion. First, to assume that in all respects land values will decrease with increasing distance from the CBD is an over-simplification. This is because clustering of some socio-economic groups also plays a significant role in determining land values in Accra. For instance, a few areas such as the Airport Residential area with high land values are located in the periphery while some areas with low land value such as Chorkor are located in the inner city, providing an exception to the general land value-distance rule. This exceptional case accounts for the virtual absence of urban cultivation in a few periphery areas such as the Airport Residential area (as shown in Fig 4.6) and the concentration of urban gardens in some sections of the inner city such as Adabraka. Secondly, to assume that areas with low land value will be attractive to urban cultivation while high income areas will repel urban cultivation is also an over-statement. This is because Cantonment and North Labone are examples of areas with high land values but which provided excellent opportunity for urban cultivation. These areas are characterized by well-planned settlements with good backyards and open spaces which are used for horticulture and urban gardening. On the other hand, some low-income areas such as Ussher Town and James Town provides less incentive to urban gardening due to their unplanned nature, lack of zoning for horticulture and green space, haphazard development, and the problem of garden theft.

In summary, in response to urban encroachment and land pressure, coupled with spatial variation of land values, four transitory land uses can be identified in Accra based on the degree to which the land is farmed. One, within the CBD, a zone of dense residential and commercial development with no significant urban cultivation; two, an outlying area close to the CBD with intensive urban cultivation confined to residential backyard spaces and the urban corridor (such as beneath transmission lines and along roadsides); three, a peri-urban area with increased extensification of cultivation of traditional crops on open green spaces; and
four, an outlying rural area not affected by urban growth, with traditional forms of food cultivation.

4.1.4 Land Use Acts

Since the colonial era, a number of acts have been promulgated to regulate the use of land in Accra. These acts in one way or the other have affected the delivery, accessibility and the security of land for urban gardening in Accra. The Town Ordinance of 1892 (Cap 86), which was the first land use act to be passed, had the purpose of regulating the siting and building of individual structures of all types as well as promoting public health. Unfortunately, the ordinance had no provision for land control or planning. The legislation allowed the use to which a piece of land was finally put to be determined by the price offered for it. This provision had adverse implications for farming as urban agriculture could not compete for land with other land uses such as residential and commercial uses. Thus, with free market competition for land between agriculture and other urban land users, agriculture paying the lowest price for urban land had always been out-competed or had to take what remains, which in most cases were infertile and derelict lands.

The second land use legislation which came into effect was the 1945 Town and Country Planning Ordinance (Cap 84). The primary purpose of this legislation was to regulate the general planning and development of 123 human settlements in Ghana. While the Town Ordinance of 1892 regulated town development on a piecemeal basis by controlling individual building operations as and when each comes to be carried out, Cap 84 introduced for the first time a system of planning in advance to guide the growth and development of settlements on a comprehensive, holistic basis as well as by incremental control actions. The legislation has the purpose of making provision "for the orderly and progressive development of land, town and other areas, whether urban or rural.....for conserving and developing resources and to
preserve and improve amenities thereof......". The main feature of this ordinance included the preparation of an advance planning scheme to promote and guide development of a declared planning area, institution of physical development controls to ensure that various cumulative physical developments conform to the provisions of the general scheme, and compensation payable for properties that are injuriously affected by a planning decision.

With regard to urban cultivation, certain sections of Cap 84 posed significant limitations to urban farming. In the ordinance, Section (1)2, interpret the term “land development” as “any building or rebuilding operations or the use of the land or any building thereon for a purpose which is different from the purpose for which the land or building was last being used." Thus, the definition excludes the cultivation of urban space for food as a land development practice, and this interpretation set the tone for today's non-recognition of urban farming as an urban land-use activity. Furthermore, Section 23(1) also stated that the Town and Country Planning Board has the power “to remove, pull down or alter, so as to bring into conformity with the provision of the scheme, any building or other work which does not conform to those provisions, or the removal, demolition or alteration of which is necessary for carrying the scheme into effect”. The implementation of the above regulation discriminates against urban gardening in that city officials are often reluctant to demolish buildings which had encroached on areas zoned for green space because some building owners are politically or financially influential individuals in the community. In addition, such demolition tends to attract the sympathy of the local officials and the general public, as they are often swayed by the enormous amount of money invested in such buildings. In contrast, gardeners who illegally cultivate land set aside for uses other than farming have had their gardens destroyed without hesitation as local officials and the general public perceived farming as alien to the urban landscape. Although Section 23 (2) requires the metropolitan authority to serve any illegal occupier of the land notice of proposed actions to be taken as well as specify the grounds
upon which it proposes to take such action, in Section 23 (3) such an occupier is only given one month to evacuate the land. From the perspective of an urban gardener who has illegally encroached on land, this period is very short considering the fact that it requires two to three months for most crops to complete their cycle of maturity. Unfortunately, farmers are not compensated for crops destroyed, as Section 29(1) stipulated that “no compensation shall be payable in respect of the prohibition imposed by the ordinance upon development of land subject to demolition and destruction”.

In the 1960, the Protection of Purchasers Act was promulgated with the main purpose of providing security to land purchasers. A critical evaluation of this Act by Bentsi-Enchill (1964) reveals that the act deals only with the symptoms of ownership problems, and may even operate to increase insecurity regarding titles. His evaluation dwelled much on group-owned land where families were acknowledged to be owners of land and which had created the problem of identifying the persons with the authority to deal with the sale or lease of such land. Land developers, therefore, often find themselves buying a law suit instead of the land. To resolve this problem, the Administration of Lands Act (Act 123) came into effect in 1962 which recognized the traditional components of land law, regulated the disposal of interest in land, guaranteed security of tenure, promoted development and provided an efficient mechanism for the administration of stool lands. However, doubt existed as to whether family and other communal lands were covered by the definition of stool land to make the act applicable to all such lands (EPC, 1994a).

In 1962, the State Lands Act (Act 125) was also promulgated to deal mainly with the compulsory acquisition of land, and the powers to be exercised by the President as well as the legal procedures to be followed in declaring such land required for public interest. A limitation of this enactment to urban farming stems from a section in which the government requires some vacant lands to be developed within a specified number of years; if not, they could be
confiscated by the state. The government decision to have such vacant land developed stems from their notion that the location of such vacant land either spoils the aesthetic development of the city or provides potential hiding places for criminal activities. Under this provision, the government recognized vacant plots under urban gardening as unused lands; hence, they are to be confiscated if they remain undeveloped. This legislation has a provision which provides authority to the government to withdraw the land title from a person who fails to develop the unused land within a specific period. The state could go ahead to issue such land title to anyone who is interested in developing such land immediately.

4.2 **Urban Agriculture Within the Context of Future Urban Development in Accra**

Future growth of urban agriculture in Accra will depend on the availability of vacant land or green space, the potential of future expansion of the existing urban green space, and the extent to which such green space is encroached by urban expansion. This section examines the nature of, and threats facing existing open green space in Accra, and analyzes how the three urban development models, currently being considered by the Accra Planning Development Program (APDP), could affect Accra’s green space in the future, and support expansion of agricultural land use in the metropolis.

4.2.1 **Accra’s Green Belt**

The potential for future expansion of urban cultivation in Accra hinges very much on the ability of official policy to support, and land use planning to protect, existing green space in the metropolis. This is because a significant number of urban gardens are located in and around open green spaces in the metropolis. A reconnaissance survey reveals that the cultivation of the local staples occurs mainly in the fairly extensive open green spaces along the Korle Lagoon, around the Achimota quarry, between Achimota and University of Ghana, south of
Figure 4.8: The Spatial Distribution of the Parks and Gardens of Accra

Source: Dept. of Parks and Gardens, 1996

All parks lining the streets are aesthetic parks.
the Accra-Tema motorway industrial zone, and in much smaller open green space all over the expanding northern, western and northeastern parts of the city. Similar gardens were also observed in the open green spaces to the north and east of Tema’s industrial zone. There is also cultivation of exotic vegetables like cucumbers, cabbages, carrots and lettuce in narrow strips of open space along the Odaw streams (near Plant Pool) and the Nima Creek from Opeibea House to the new CSiR library, and the major drainage channels close to the access roads to Ring Road West. A growing number of areas zoned for the development of metropolitan parks and gardens in Accra have also witnessed tremendous cultivation of crops and vegetables. Over the years, the Department of Parks and Gardens has tolerated, if not encouraged, food cultivation on some designated metropolitan parks and gardens to make up for the Department’s inability to maintain such properties. Currently, there are about 30 parks and gardens within the metropolis. These include the Legon Botanical Garden, Ridge Park, Holy Gardens, the Rotary Gardens, Airport Park, Licensing Office Park, Parks and Garden Headquarters, Cantonment Park, Black Star Square, Marine Drive Park, Old Polo Ground Park, Horticultural Nurseries, Kinbu Park and Awudome Park. Seven metropolitan gardens can also be located around the major road circles of Kwame Nkrumah, Sankara, Danquah and African Unity. A map (Fig. 4.8) shows that most of these parks and gardens are located outside the older residential areas in the south-west part of the city. This could be explained by the fact that there are virtually no open green spaces in the older sections of the city such as Adabraka, Jamestown, and Bukom except along the major transportation routes. When the original occupants of these areas were putting up their buildings, there were no zoning regulations which made provisions for green space in the city. Planning was then relatively young in the city of Accra, and the houses in these older settlements were put up before the establishment of the Department of Town and Country Planning in 1923. However, with the establishment of the Department of Town and Country Planning in Ghana and the realization
of the need for green space in the city, some portions of these old settlements were re-zoned for park development. However, this re-development was hindered by inadequate funds to compensate the owners of the land to be acquired. Secondly, these indigenous settlements, exercising autonomous customary land rights, have also acted as an impenetrable walls repelling major land use changes, including re-zoning for green space. The department therefore had to confine park development to transportation routes.

There are only two forest reserves in and around the metropolis, the Achimota Forest and Dechidaw Forest. The Achimota plantation forest reserve was planted in 1924. The plantation has been dwindling in size over the years. In 1969, it was 74 hectares but today this has reduced to 36.54 hectares (Ministry of Local Government, 1989). The reserve was established to supply fuel wood to the Achimota School and to serve as watershed protection, soil erosion control and wildlife protection. In the past, the main threat to the reserve came from residential and educational uses. The Ghana Institute of Management and Public Administration occupies part of the forest. In April 1969, the national government allowed part of the reserve for residential developments in northern Dzorwulu and Abelenkpe. The Accra-Tema motorway extension project also has affected the forest. There is also a problem of periodic trespassing by hunters and residents of the Christian Village which lies adjacent to the reserve. In a few instances, trespassers have caused bush fires in the plantation. The second forest reserve, the Dechidaw Forest Reserve is a much smaller one, and served until recently as a natural habitat and protective watershed for the Dechidaw catchment. However, due to degradation of the land and forest, the Department of Forestry decided to turn the land over to agro-forestry practices (intercropping trees with food crops) - (Ministry of Local Government, 1989).

In Accra, urban encroachment has compromised natural landscapes and other open spaces in or adjacent to the city. As already indicated, there has been an increasing
encroachment by housing upon parks and gardens managed by the Department of Parks and Gardens. This observation was even noted by Amuzu and Leitmann (1992) who indicated that illegal encroachment on several open spaces earmarked for recreational activities has taken place in Accra. Besides the loss of prime agricultural land, the conversion of open space for urban development has also increased water impermeable areas and therefore upset natural drainage systems which may be available for urban cultivation (Ministry of Local Government, 1989). The conversion of prime agricultural land to other use has negative impacts on food security as not only do additional farmlands have to be found elsewhere but the food has to be carried from greater distances or imported and stored for longer periods at higher energy cost to consumers (Bernstein, 1994). This is likely to increase prices of food in the city.

To protect these reserves and green spaces against trespassers, the NRC Decree 243 (1974) on forest protection was amended by PNDC Law 142 (1986). Under this revised legislation, first time offenders are liable to a fine of 5,000 cedis, second time offenders to 10,000 cedis fine and/or 6 months imprisonment. Recently, a new law has been passed by the Accra Metropolitan Authority under the Accra Beautification Program, stipulating that ornamental trees and gardens should be planted along all ceremonial roads and also in front of all houses. The growing of grass lawns and shade trees is also to be reactivated. Other legislation is also in force against the felling of trees within the metropolis. Currently, a survey is underway to map out specific areas for the creation of Green Belts for Accra and Tema (Ghanaian Times, 14th September 1989). The Green Belt is planned to start from Weija, through Bortianor in the west of the metropolis, stretching far to the foothills of Abokobi and beyond Oyarifa in the north. In the east, the Green Belt is expected to extend to the Sakumo Lagoon and possibly beyond Michel Camp to Kpone in the west.
4.2.2 Future Development Plans and Urban Green Space in Accra

In 1990, the Accra Planning and Development Program (APDP) was given the responsibility of devising a new strategic plan for the future development of the AMA (APDP, 1992). The need for a new growth plan for Accra had become necessary due to the fact that the current laissez faire concept is inappropriate and will likely jeopardize any sustainable initiative to manage the metropolis. The current system of land use is characterized by inefficient use of urban land, increasing infringements upon the major wetlands and farmlands, longer delays in the provision of services, higher transportation and energy costs associated with poor road conditions and congestion and a substantial deterioration in living conditions in Accra. The APDP mandate is to reverse this trend and to propose a growth model for the future development of Accra by the year 2010 and beyond.

Based on the population growth rate of 4.4% per annum, the APDP provided a projection for the future land use requirements for Accra. As can be seen from Table 4.4, future land use requirements for green space constitute the largest percentage increase among all other land uses. This is an indication of the realization by the APDP of the important role open space can play in the future growth and sustainable development of Accra. In its document entitled "Strategic Action Plan for Accra", the APDP identified and is currently evaluating three urban growth models for their potential to accommodate the future growth in the metropolis' population and land use requirements as stated in Table 4.7. The three concepts considered as realistic options are urban consolidation, multi-city structure and twin city structure. The APDP is expected to make a final decision on the appropriate choice for Accra by 1998. It is the purpose of this section to examine how each of these development

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7 The total land use requirements was calculated based on the population growth rate of 4.4% per annum, which will result in an increase of 2.6 million people by the year 2000, and 4 million by the year 2010.
concepts will directly impact on the availability of open green space and land for urban cultivation in the AMA.

Table 4.7

<table>
<thead>
<tr>
<th>Land Use Category</th>
<th>1990</th>
<th>2000</th>
<th>2010</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>1,650</td>
<td>2,050</td>
<td>2,250</td>
<td>36.4</td>
</tr>
<tr>
<td>Civic &amp; Cultural</td>
<td>130</td>
<td>150</td>
<td>180</td>
<td>38.4</td>
</tr>
<tr>
<td>Institutional</td>
<td>4,280</td>
<td>5,550</td>
<td>6,980</td>
<td>63.0</td>
</tr>
<tr>
<td>Residential</td>
<td>26,350</td>
<td>33,380</td>
<td>41,940</td>
<td>59.2</td>
</tr>
<tr>
<td>Industrial</td>
<td>2,690</td>
<td>5,190</td>
<td>7,690</td>
<td>185.9</td>
</tr>
<tr>
<td>Defense</td>
<td>1,640</td>
<td>1,640</td>
<td>1,640</td>
<td>0.0</td>
</tr>
<tr>
<td>Major Roads</td>
<td>1,460</td>
<td>1,950</td>
<td>7,200</td>
<td>393.2</td>
</tr>
<tr>
<td>Transportation (Terminals)</td>
<td>920</td>
<td>920</td>
<td>1,200</td>
<td>30.4</td>
</tr>
<tr>
<td>Open Space</td>
<td>2,000</td>
<td>11,250</td>
<td>12,550</td>
<td>527.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>41,120</strong></td>
<td><strong>62,080</strong></td>
<td><strong>81,630</strong></td>
<td><strong>98.5</strong></td>
</tr>
</tbody>
</table>

Source: Accra Development Planning Program (1992)

Under the concept of urban consolidation, peripheral urban expansion is expected to be frozen or curtailed, and policies are to be designed to consolidate the existing structure of the urban area by utilizing large areas of vacant land and plots and redeveloping selected older low density development areas in the inner city (Fig 4.9a). The concept aims at achieving more intensive use of land within the existing built-up areas and higher residential densities. To achieve this, a program to complete over 8,000 unfurnished houses and in-filling as well as to
upgrade existing residential areas within the inner city is suggested by the plan. This concept would likely result in an increased dominance of the CBD over neighboring areas. The concept is projected to have the advantage of directing investment and other resources into the improvement of existing services rather than extending the existing network beyond the developed area. In addition, the model is expected to encourage the intensification in the use of urban land, as well as improve the accessibility to public services in established areas as public transport will be more cost-effective. This strategy is economic in terms of resource allocation, capitalization of urban assets, stimulation of investment and reduction in energy consumption. However, urban farming will likely be adversely affected as land availability and accessibility for urban cultivation in the inner city will severely be restricted due to the development of in-filling and vacant space and high residential densities as well as increase in land value associated with land-use intensification. The plan seeks to utilize all available open space and vacant land in the inner city, which is most often used for cultivating food and vegetables. Consequently, urban farming in the inner city will be squeezed out by residential and commercial developments. On the other hand, outer city farming will be protected as institutional regulation will curtail any further expansion of the built environment into the periphery leaving most land in the outer city vacant and available for food cultivation. Farming in outer city areas will therefore be virtually left untouched.
Fig. 4.9a The Urban Consolidation Model and the Urban Green Space in Accra
Fig. 4.9b The Multi-City Model and the Urban Green Space in Accra
Fig. 4.9c The Twin City Model and the Urban Green Space in Accra
The second model, the multi-city structure, seeks to establish several cities within the metropolitan area, each with its own business center servicing populations of 250,000-350,000. The city centers would be sited at a strategic locations to ensure easy access to public amenities and convenience for the population using them. The strategy involves decentralization of businesses, industries and commerce from the two established centers of Accra and Tema, and the establishment of at least four more centers to serve some parts of the present and the future projected urban areas (Fig.4.9b). The configuration of the concept permits a broadening of the present development pattern that makes it less necessary to develop existing open land, especially in the water courses that form part of the open space system. The extensive open space system would provide green areas or buffer zones between the cities within the metropolitan area giving it a more clearly defined structure. Clearly, such a concept will facilitate urban agriculture in the inner city as there will be less demand on land in the inner city, or no threat to existing vacant land or green space in the inner city. However, urban gardening in the peri-urban region will be adversely affected as most of the newly created city centers will be sited on peri-urban lands which are predominately under food cultivation. In addition, marketing centers for produce from urban gardens will be scattered and fragmented without economies of scale being enjoyed by the urban farmers. Thus, in contrast to the consolidation model, the multi-city model will safeguard urban farming in the inner city but will adversely reduce the potential area for cultivation in the outer city.

The third model, the twin-city concept, is based on balanced metropolitan planning in which development in Accra and Tema will be coordinated and a functional relationship between the two cities established while maintaining their existing functions (Fig. 4.9c). Three major transportation corridors would link the two cities; the motor-way, the coastal route and the central spine. Future metropolitan development will concentrate on these inter-connecting transportation corridors. The concept has the advantage of strengthening the central business
areas of Accra and Tema. The concept seeks to protect the numerous water courses and major wetlands between Accra and Tema, but would allow some space to be utilized for common uses serving the two cities such as recreation, institutional, education, research, scientific and cultural purposes. The twin city strategy could also lead to healthy competition for development - although the economic base of each city would be different with specific functions in order to allow balanced growth. The concept also proposes to preserve the vast open land between Accra and Tema and utilize it for special uses at metropolitan and national scales. Under this concept there will be relatively minimal impact on green space or vacant land in both the inner and the outer cities, compared respectively with the urban consolidation and multi-city models; however, urban gardening along the urban corridors and wedges of Accra and Tema will be more adversely affected. An increase in urban gardening can be observed in the corridors of the Accra-Tema motor-way and Accra-Tema coastal road routes, and these corridors stand to be redeveloped under the twin city concept.

Overall, each of the three concepts has differential spatial impacts on urban farming. While the urban consolidation model is likely to adversely impact urban gardening in the inner city and preserve green spaces in the outer city, the multi-city model will likely threaten urban cultivation in the outer city, while preserving existing green space in the inner city. Finally, the twin city concept will undermine urban gardening along major corridors between Accra and Tema. A choice as to which concept is best is beyond this study as it will entail a detailed cost and benefit analysis and evaluation of each of the concepts.
Chapter Five

LOCATION AND PRODUCTION MIX OF URBAN CULTIVATION

This chapter analyzes the location of urban agriculture in the AMA and the comparative advantages and disadvantages associated with the major sites of urban gardening in the metropolis. It also examines the residential location of urban gardeners vis-à-vis the sites of their gardens, and presents a model of the change in urban garden concentration over space and time in the AMA. In addition, the chapter assesses the gender significance of urban agriculture in the inner city vis-à-vis the outer city, and provides a general description of the two methods of urban cultivation emanating from the response to urban land-use dynamics in Accra.

5.1 Locational Analysis

The survey revealed various concentrations of urban garden across the AMA (Fig. 4.6 and Fig. 5.1). In the outer city, speculative lands and open vacant space provide greater access to land for urban gardening. For instance, scattered concentrations of urban gardens are found in the open spaces along the Korle Lagoon, around the Achimota quarry, the area between Achimota and the University of Ghana, the area south of the Accra-Tema motorway and in the newly developed area of Madina-Adenta. In the inner city, urban gardens are concentrated along the narrow strips of open space along the Odaw stream, the area between the Plant Pool and Nima Creek, the area between the Opeibea House and the CSIR’s new library, and along the drainage channel aligning the Ring Road West. Urban gardens are also found in the residential backyards of some low-income neighborhoods of
Adabraka, Chorkor, Sabon Zongo, Lartebiokorshie, Abose-Okai, Kotobabi, Labadi, Bubuashie and Old Dansoman. There are also small concentrations of urban gardens in high-income residential areas of North Labone and Cantonment.

Urban gardens are found on institutional grounds of the Ring Road North Industrial area, the Police Training Depot, the Ambassador Hotel, the Korle Bu Teaching Hospital and the Caprice Hotel. The inner city section of the River Odaw, and its tributaries, has attracted intensive urban gardening along its banks. Urban gardening is also practiced along gutters and streams that drain into the Klottey Lagoon, in Osu. Other significant sites of urban gardens are along transportation routes of Josef Broz Tito Avenue, off Switchback Road, which links the Police Headquaters to the 37 Military Hospital. Along this avenue are the foreign missions of Japan, Algeria, Nigeria and Lebanon, the Chief Justice’s Residence, Flair Catering House, and the Kumodjie Hospital - these are major markets for exotic vegetables. Urban gardens are also found in Adabraka and Kaneshie, along the dual carriage road between the Kwame Nkrumah Circle and the Obetsebie Lamptey Roundabout, and also along the Graphic Road. Vacant or open green spaces, not allowed or unsuitable for any physical development, are also sites for urban gardening; mention can be made of Burma Camp (a military base), Achimota Forest parks, and the garbage dump sites opposite to the West Africa Examination Council and the Workers College Campus and along the Korle Lagoon and Korle-Gonno. There is also a community garden in the North Kaneshie-Ring Road West Industrial Area. This garden is condominium or co-operative in character, in which each participant cultivates his/her own plot and shares responsibility for common gardening elements such as pathways, fences, water supply, security and storage. The community garden emerged as a result of a common social element of ethnicity and social class; almost all gardeners are immigrants from northern Ghana who share a
common occupation as “watchman” (night security). Schools gardens in which the students are encouraged to engage in gardening as part of their school curriculum, are also very popular in Accra. The goal is to raise money for the school and also to instill in the students the techniques and habits of growing what they eat. School gardens are located in Labone Secondary School, St. Aquinas Secondary School, Accra Polytechnic and Adabraka Primary/Junior Secondary School. Finally, urban gardening occurs under the power transmission lines of the Electricity Corporation and the Volta River Authority which stretches from Dwowulu to Alajo.

There are certain advantages and disadvantages associated with the major gardening sites mentioned above (Table 5.1). Compared to other sites, gardens located in residential backyards possess certain advantages which include, one, that they have better or more land tenure security (as most of the garden plots surrounding residential buildings are owned by the gardeners); two, that the proximity of backyard gardens to a gardener’s place of residence saves him/her considerable commuting time and transportation cost; three, that water for irrigation is easily available from house pipes, and a gardener could easily access organic manure from their household kitchens, and; four, that crops on backyard gardens are less prone to theft due to their close supervision by household residents. However, backyard gardening has the disadvantage of smaller land size due to limited space, and also has less potential for future expansion due to increasing conversion of backyard space for residential extension.

Gardens along streams and drainage channels possess the locational advantage of being close to a source of water. Indeed, water is one of the most significant factors influencing the siting of vegetables along culvert, gutters and streams. Furthermore, siting urban gardens near a perennial water course enables all
year-round crop cultivation. The problem associated with siting gardens along water courses is that occasionally floods inundate garden plots in the wet season, and there is water pollution which could contaminate food crops. Flooding mostly occurs along areas adjacent to gutters and drainage channels which are choked by silt or suffer from poor maintenance.

Siting gardens close to/or along major transportation routes possesses the advantage of providing easy access of garden produce to customers and convenient means of transporting garden produce to the urban market in Accra. There are a growing number of selling points of exotic vegetables along major transportation routes in Accra, especially along the dual carriage road between the Kwame Nkrumah Circle and Obetsebi Circle, along the Airport Road, around Tetteh Quashie Round-about and the toll area of Accra-Tema motorway. This form of marketing is known as roadside marketing, where gardeners or retailers market their produce to occupants of slow moving vehicles or vehicles which have come to a stop at a traffic light. Occupants of private cars are often the target as they are perceived as wealthy, and therefore able to afford the price of exotic vegetables, which form part of their main diet. Also, since vegetable crops are perishables, roadside gardening enables quick transportation of such crops to the urban market, thereby avoiding the possibility of deterioration due to lack of storage facilities. Such location also provides easy access to, and convenient means of, transporting farm inputs to gardening sites as well as the ability of gardeners to commute to and from work and the garden sites without a hassle. The only concern associated with roadside gardening is that of conflict between gardening and traffic priorities (sites for parking and terminal points), risk of theft and vandalism due to easy public access, and the risk of food contamination from vehicle emissions (these concerns are discussed in detail in the next chapter). Gardens located on utility lands
(beneath power transmission lines) have the advantage of providing a long, continuous and uninterrupted stretch of plots for gardening, creating a wide food shed for the urban community. The long stretch of garden plots also creates the avenue for community gardening with its accompanying benefits of resource pooling and economies of scale in food production, distribution and marketing. Utility land also has the advantage of less encroachment as physical developments are often prohibited on such land. However, gardeners are susceptible to the potential harmful effects from electric/magnetic fields from the power transmission lines. In addition, any repair on any faulty power transmission lines often means that crops cultivated under such transmission lines are more likely to be trampled in the course of the repair. The ability of the maintenance staff of the power corporation to enter the gardens, without the permission of the gardeners, signals that such gardeners have less control of such land. There is also the danger of gardeners being exposed to live electrical cables which might fall on the garden plots. There are a number of incidents where the transmission cables of the Electricity Corporation of Ghana (ECG) fell to the ground due to the effects of strong winds and heavy rainfall.
Table 5.1

Advantages and Disadvantages of Major Sites of Urban Gardening in Accra

<table>
<thead>
<tr>
<th>Sites</th>
<th>Advantage</th>
<th>Disadvantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backyard gardening</td>
<td>• secure land tenure</td>
<td>• smaller garden size</td>
</tr>
<tr>
<td></td>
<td>• access to kitchen manure</td>
<td>• less space for expansion</td>
</tr>
<tr>
<td></td>
<td>• no transportation cost</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• time saving</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• protection from theft</td>
<td></td>
</tr>
<tr>
<td>Roadside gardening</td>
<td>• easy access to marketing</td>
<td>• traffic conflict</td>
</tr>
<tr>
<td></td>
<td>• proximity to transportation</td>
<td>• risk of food theft and vandalism</td>
</tr>
<tr>
<td></td>
<td>• enhanced gardeners’ mobility</td>
<td>• risk of food contamination</td>
</tr>
<tr>
<td>Stream-side gardening</td>
<td>• regular access to water</td>
<td>• prone to flooding</td>
</tr>
<tr>
<td></td>
<td>• all year round cultivation</td>
<td>• risk of food contamination</td>
</tr>
<tr>
<td></td>
<td>• no water cost</td>
<td></td>
</tr>
<tr>
<td>Transmission line gardening</td>
<td>• less land encroachment</td>
<td>• less control of land</td>
</tr>
<tr>
<td></td>
<td>• wide stretch of garden plots</td>
<td>• health hazards</td>
</tr>
<tr>
<td></td>
<td>• community gardening</td>
<td>• exposure to live cables</td>
</tr>
<tr>
<td></td>
<td>• resource pooling</td>
<td>• susceptible to crop destruction</td>
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<td>• economies of scale</td>
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<td>School gardening</td>
<td>• less land encroachment</td>
<td>• seasonal cultivation</td>
</tr>
<tr>
<td></td>
<td>• strong institutional support</td>
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<td></td>
<td>• scientific applications</td>
<td></td>
</tr>
</tbody>
</table>
Plate 5-1 A frontyard garden at Kaneshie, in the inner city.

Plate 5-2 A backyard garden in Kaneshie, in the inner city.
Plate 5-3  Vegetable cultivation located beneath power transmission lines.

Plate 5-4  Maize cultivation beneath a telephone line in Adabraka.
Plate 5.5  A vegetable cultivation along a perennial water stream at Kaneshie.

Plate 5-6  A garbage gardening near Accra Workers College, in the inner city.
Gardens located on school properties have the advantages of less land encroachment, strong institutional support from the school authorities and collective participation of students, which promotes resource pooling. School gardening also facilitates the application of scientific and technical innovations in urban agriculture due to the link between the education curriculum and gardening practices. The disadvantage is that most often school gardening is seasonal, as it ceases when schools are on holidays. Although gardening on institutional lands belonging to hospitals and government offices might not face the limitation of seasonal gardening, they do not normally enjoy the benefits of collective participation, resource pooling and innovative initiative which are associated with school gardening.

Having assessed the various locations of urban gardens in the AMA, it is reasonable to explore the residential location of those involved in urban cultivation. The questionnaire interview inquired whether urban gardeners reside in the same zone (inner city or outer city) where they farmed. The survey reveals that about 73% of the gardeners who farmed the inner city actually reside in the inner city while 60% of the outer city gardeners reside in the outer city. Thus, although most gardeners farmed the locality where they reside, there were cross-boundary situations where some gardeners had their gardens located outside the locality of where they reside. That is, there was a cross-boundary movement of 40% of the gardeners who reside in the inner city but farmed the outer city (centrifugal variant) while about 27% of the gardeners commute from their place of residence in the outer city to cultivate the inner city (centripetal variant). The centrifugal variant mostly occurs when a gardener resides in the inner city but decides to commercially cultivate the periphery due to the limitation imposed by lack of space in the inner city. The centripetal element mostly occurs when a gardener resides in the outer city but decides to cultivate exotic vegetables in the inner city due
to the closeness to the urban market, access to secure land (utility land), and all year-round availability of water from streams. This group also consists of gardeners, mostly "watchmen" (night security men), who commute to the inner city for jobs, and are encouraged by their client to cultivate the backyard space or the neighborhood close to their work place. There are two important reasons explaining why "watchmen" might prefer to cultivate the inner city where their job is situated, rather than the outer city where they reside. First, the places where they provide the security service are mostly residential units located in high-income areas with well laid-out, spacious open spaces surrounding the buildings. They are encouraged to cultivate this space as part of the incentive bonus offered by their clients. Secondly, the timing of performing major garden operations also influences their decision to cultivate the inner city. Frequent gardening activities such as irrigation, weed picking and land forking are normally done early in the morning before sunrise and late in the day immediately after sunset, times when the "watchmen" are expected to be at work for their night duty. Consequently it is impossible to cultivate the outer city where they reside.

The relative importance of food produced in different regions within AMA is likely to go through three transitional phases as urbanization proceeds (Fig.5.2). In the first phase, there is a relative preponderance of urban gardens located in the present-day inner city as compared with the urban periphery. This could be explained by the fact that in the early period of urban development in Accra there were vast expanses of open green spaces, as pressure on urban land was very minimal and the urbanization
process was at its infant stage. The availability of such vast open space made possible the cultivation of crops in the inner city. Although there were similar vast open spaces in the outer city, due to time and transportation constraints, gardeners preferred to site their gardens closer to their homes in the inner city. Furthermore, market centers for vegetable crops are concentrated in the inner city; hence, there is the incentive for urban gardeners to prefer the inner city to the outer city. Besides, the early gardens in Accra were the "drainage basin" types which lie adjacent to streams and drains which mostly flow through the inner city (Ministry of Local Government, 1989). Thus, in phase one, urban gardening is more dominant in the inner city than the outer city due to the advantages of distance and market accessibility, as well as the availability of vast vacant green space and less land encroachment within the city.

As physical development expands and land use intensifies within the city, vacant plots normally under urban cultivation are encroached upon and developed for non-farm uses. Consequently, the inner city becomes less attractive to urban gardening. Thus rising land value, coupled with increasing land encroachment which is associated with intense physical development in Accra, poses a significant limitation on the part of urban gardeners to use land in the inner city. The effect is the relocation of urban gardens from the inner city to the urban periphery, where land is readily availability and more accessible. This defines the second phase. Thus, in the second phase, the outer city becomes more attractive to urban cultivation than the inner city as garden plots (green spaces and vacant land) in the inner city are rapidly converted to residential and infrastructure developments. At this stage, gardening in the inner city will largely be confined to utility-rights-of-way, along streams, and in a few residential backyard spaces where physical development is not permitted. The urban periphery will thus dominate Accra’s local food shed during this phase.
Fig. 5.2 Relative Spatial Concentration of Local Food Shed in Accra: A Transitional Model
The third phase witnesses the diminishing role of the urban periphery in the production of local food in response to the rapid spread of urbanization to the urban periphery. As urbanization spreads rapidly to engulf the urban periphery, peri-urban lands become increasingly scarce and fully utilized for non-farm purposes, with some lands placed under speculative uses. As garden plots are increasingly utilized for physical development urban cultivation is pushed further away to the outlying rural areas, sometimes outside the administrative jurisdiction of the Accra Metropolitan Area.

A significant outcome in the third phase is that the availability and accessibility to peri-urban land for gardening will be more limited than those in the inner city. This is to say, although land space for urban cultivation will diminish both in the inner city and the peri-urban area in respond to the rapid spread of urbanization, that of the peri-urban area will be more dramatic and severe. This is because of the likelihood that the new developments taking place in the urban periphery will continue to be unplanned and haphazard, with little or no room for backyard space, green space allotment, utility-rights-of-way and infrastructure development. These are the niches which sustained urban cultivation in the inner city in the face of intense land development and conversion process in phase two. Hence, the presence of such survival niches in the inner city (during phase two) and their virtual absence in the outer city in the third phase will likely lead to the relative dominance of the inner city in urban cultivation over the peri-urban area in the third phase.

The occurrence of the third phase is speculative, and may be possible only if future land development continues to be unplanned and haphazard. Thus, with measures to protect the existing green space and garden plots and the strict

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1 As the physical built-up areas of the inner city expand to engulf some parts of present-day outer city, the boundary of the well-planned layout of the inner city will not expand as the spread of the built-up areas will be characterized by haphazard, leap-frog developments.
enforcement of land-use regulation, it is possible that the third phase will not materialize. Currently, in Accra, the peri-urban land is at its infant stage of development, so the occurrence of the third phase will likely take some time. Hence, the planning authorities in the AMA should undertake proactive measures to protect the green space and garden plots in the peri-urban areas to avoid Accra losing its potential to produce some of its own food requirements in the future. The overall reduction of land for urban cultivation in both the inner city and outer city will likely compel residents of Accra to increase their dependence on food supply from the outlying rural areas or the hinterlands, extending the food shed and the ecological footprint of Accra.

5.2 Production Analysis.

Urban gardening, like rural farming, consists of a varying production mix. Significant differentiation is discernible in the development, operation, and management of urban gardens located in the inner city from those in the peri-urban areas of Accra. Thus, it is the research hypothesis that varying distance of urban garden locations to the city core has produced complex and divergent reactions by gardeners to urban farming in AMA, resulting in different production mixes.

The extent to which urban agriculture in Accra is influenced by land tenure, land value, market proximity and transportation accessibility was examined in the previous chapter. This section provides a complete description of the various methods of production which have emerged in response to the land use dynamics in Accra. As has already been noted, the choice of the type of crop to be cultivated (exotic vegetables or indigenous crops) could be influenced by the type of land tenure, the degree of land security, or the cost of land; however, the decision as to what variety of crop is
produced could also be determined by other factors. That is to say, market accessibility, land value and transportation proximity could influence a gardener's decision to cultivate exotic vegetables, but the decision as to which exotic vegetables to grow is conditioned by another set of factors.

The survey revealed various reasons why gardeners would prefer to grow one crop to another. The most dominant consideration mentioned by urban gardeners is the extent to which the crop is marketable. About 47% of the urban gardeners indicated that they prefer to grow marketable crops such as lettuce and cabbages which are in constant demand and for which economic returns are very high. These gardeners are commercial cultivators who are interested in maximizing profit by increasing the sale of their produce. However, about 42% of the cultivators are interested in maximizing profit by reducing their cost of production. This group of gardeners choose to grow vegetables such as carrots because the cost of production is relatively low, as they thrive well without insecticides and chemical fertilizers. Almost 30% of urban gardeners based their decision to cultivate a particular kind of crop on how long it takes for that crop to mature. These are mostly commercial growers who prefer to cultivate crops with short maturity periods (e.g. radish, lettuce and cucumber) which they can cultivate many times in a year to maximize earnings (Table 5.2). However, the decision to cultivate a rapidly or slowly maturing crop is conditioned by the duration of time a particular space is available to the gardener. About 26% of the urban gardeners cultivate a particular crop because they are expensive on the market, and by producing such crops themselves they will be able to reduce their household food budget. Also, 37% of the urban gardeners cultivate crops such as beans because they perceive such

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2 Most gardeners provide more than one reason, so the percentage total exceeds 100%.
crops to have high nutritional value, which is of health benefit to the family, especially their young children.

Finally, some gardeners' choice of crop to be grown is influenced by their ethnic background. Urban gardeners are from diverse ethnic groups and this is reflected in the crops they produce. Thus, more than 16% of the urban gardeners grew crops to correspond with their ethnic food preferences. This is supported by an earlier study by Gyasi (1976), who indicated that the Krobo lay emphasis on cassava production because it is their staple crop; the Ewes tend to grow okro in their backyards for the preparation of Okro stew served with their local diet "akpele"; and plantain and cassava are found mainly in the backyards of the Akans.

Table 5.2

Duration of Maturity and Frequency of Cultivation of Garden Crops Grown in Accra

<table>
<thead>
<tr>
<th>Crops</th>
<th>Maturity Duration (week)</th>
<th>No. of cultivation/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrots</td>
<td>10 - 14</td>
<td>3</td>
</tr>
<tr>
<td>Raddish</td>
<td>4 - 5</td>
<td>6 - 8</td>
</tr>
<tr>
<td>Cabbages</td>
<td>10 - 13</td>
<td>3</td>
</tr>
<tr>
<td>Garden eggs</td>
<td>10 - 13</td>
<td>3</td>
</tr>
<tr>
<td>Lettuce</td>
<td>7 - 9</td>
<td>4 - 5</td>
</tr>
<tr>
<td>Onions</td>
<td>14 - 16</td>
<td>2 - 3</td>
</tr>
<tr>
<td>Cucumber</td>
<td>8 - 10</td>
<td>3 - 4</td>
</tr>
<tr>
<td>Maize</td>
<td>16 - 24</td>
<td>2</td>
</tr>
<tr>
<td>Peanuts</td>
<td>14 - 22</td>
<td>2</td>
</tr>
<tr>
<td>Beans</td>
<td>15 - 22</td>
<td>2</td>
</tr>
<tr>
<td>Pepper</td>
<td>12 - 16</td>
<td>2</td>
</tr>
<tr>
<td>Cassava</td>
<td>over 48</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Author's Field Survey, 1996
The survey indicated that there was mixed cropping in most of the gardens. Cabbage-lettuce and lettuce-carrot combinations were popular among the vegetable growers. The popularity of these combinations can be attributed to the complementary demands of such produce and the motive to maximize earnings. Also, early maturing crops are often inter-cropped with late maturing crops. Inter-cropping lettuce (early maturing) and cabbages (late maturing) crops are common in this regard. A decision to inter-crop could also be seen as a means of providing insurance against any unexpected fall in the supply or price of one of the crops. It was also noted that some gardeners practiced crop rotation, such that they do not grow crops on the same piece of plot or in the same row for two or more consecutive years. The purpose is to keep the fertility of the soil intact. A typical crop rotation practice is the cultivation of root crops such as carrot and onion (which make a demand on nutrients) followed by the cultivation of leafy or leguminous crops such as lettuce and beans (which supply nutrients into the soil). The following crop rotational pattern was indicated by the community gardeners in Kaneshie.

Table 5.3

Crop Rotation at Kaneshie Community Garden

<table>
<thead>
<tr>
<th>Year</th>
<th>First Row</th>
<th>Second Row</th>
<th>Third Row</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>cabbage</td>
<td>onions</td>
<td>beans</td>
</tr>
<tr>
<td>Year 2</td>
<td>onion</td>
<td>beans</td>
<td>cabbage</td>
</tr>
<tr>
<td>Year 3</td>
<td>beans</td>
<td>cabbage</td>
<td>onions</td>
</tr>
</tbody>
</table>

Source: Author's Field Survey, 1996
Thus, it can be suggested that, to some extent, urban agriculture contributes to species diversity in the metropolis, and this enhances the integrity of the urban ecological system. It is observed that backyard gardens cultivated to meet household food consumption have the highest crop diversity (mean of 3.4), as gardeners aimed at producing different crop varieties to supply all the needed ingredients in the preparation of the household's soups or stews. However, urban gardens geared towards market production have lower species diversity (mean of 1.5), as gardeners benefit more from specialization of crop production. The difference is statistically significant as indicated by a t-test analysis (t-value=12.6, df=57 and 2-tail=0.000) which reveals that if the mean sizes of garden plots in the inner city and the outer city were exactly the same, there is no chance we could expect a mean difference of 1.98. Female gardeners tend to cultivate more different types of crop (mean of 3.5) on the same land than their male counterparts (mean of 1.5), as women do more subsistence oriented cultivation while men concentrate on market production. The mean difference is statistically significant as revealed by a t-test analysis (t-value=12.8, df=58 and 2-tail=0.000) which indicates that if the mean sizes of garden plots cultivated by male and females were exactly the same, there is no chance we could expect a mean difference of 2.0.

As already noted, two methods of urban cultivation are identifiable among urban gardeners in Accra. The first is the intensive cultivation of exotic crops. Garden tools normally used in this type of cultivation include simple, locally made implements such as hoes, digging forks, hand forks, watering cans and spades. This method involves a series of distinct operations, beginning with land clearing, followed by the preparation of beds raised above ground level. Beds are raised to the extent where gardeners can reach the middle from either side to weed, irrigate or pick crops. Raised beds reduce
soil compaction due to human traffic between rows and minimize aeration and drainage problems.

After the bed is prepared, the next operation is the application of organic manure or chemical fertilizers which are spread or dug into the soil for a few days after which the soil is ready for sowing. Sowing is either direct for vegetable crops like carrots, or seeds are nursed and transplanted for vegetable crops like lettuce, onion and cabbages. The garden beds are watered liberally twice a day, in the morning and in the evening.

Other activities include weeding and forking. Weeds are hand-picked because spaces between vegetable crops are too small for bigger implements like a hoe to be used. The beds' top soils are loosen with fork to facilitate hand-picking of weeds, penetration of irrigated water and the prevention of hard cap formation on the surface. Kitchen, animal or compost manure are sometimes used to supply nutrients to the soil. Some gardeners keep poultry as a tactical means of earning supplementary income while at the same time supplying poultry droppings to fertilizer their gardens. Crops which are prone to attacks by pests, like cabbage and cauliflower, are treated with insecticides or kitchen ashes. Harvesting is carried out immediately after the vegetable crops are mature, and immediately new seeds or seedlings are sown or planted. This process is repeated 3-4 times in a year for vegetable production.

Another significant characteristic of intensive cultivation is the reliance of water from homes or streams for all-year cultivation of vegetables. Thus, one major development relating to the intensive cultivation of exotic vegetables in the inner city is vegetable forcing, which is the growing of exotic vegetables out of their normal season. This is accomplished by the use of household pipe water to irrigate the gardens during dry, off-season periods or reliance on stream water or channel water. This development
Table 5.4

A Comparison of Production Methods of Urban Gardening in Accra

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Intensive Method</th>
<th>Extensive Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of crop</td>
<td>exotic crops</td>
<td>indigenous crops</td>
</tr>
<tr>
<td>Dominant location</td>
<td>inner city</td>
<td>outer city</td>
</tr>
<tr>
<td>Implements</td>
<td>hoe, digging fork, spade, hand fork, watering can</td>
<td>cutlass and hoe</td>
</tr>
<tr>
<td>Land preparation</td>
<td>raised bed</td>
<td>flat land</td>
</tr>
<tr>
<td>Sowing method</td>
<td>direct and transplanting</td>
<td>direct</td>
</tr>
<tr>
<td>Soil improvement</td>
<td>fertilizer and organic manure</td>
<td>none</td>
</tr>
<tr>
<td>Crop improvement</td>
<td>pesticides application</td>
<td>none</td>
</tr>
<tr>
<td>Source of irrigation</td>
<td>streams or pipes</td>
<td>rain-fed</td>
</tr>
<tr>
<td>Frequency of cultivation</td>
<td>all year round</td>
<td>twice a year</td>
</tr>
<tr>
<td>Size of plot</td>
<td>small</td>
<td>large</td>
</tr>
</tbody>
</table>

Source: Based on Author's Field Survey, 1996
Plate 5.9 An intensive cultivation of exotic vegetables on small, raised beds in the inner city.

Plate 5.10 An extensive cultivation of indigenous crops on a larger, flat ground in the outer city.
also arose in response to year-round demand for fresh vegetables. Exotic vegetable growers are involved in cultivation throughout the year; normally, during the two wet seasons (April-June and August-October) plus the high demand periods which coincide with festivities such as Christmas (dry season) and Easter. It is during the dry season periods (November-February) that urban gardeners derive most income from the cultivation of vegetable crops as food supply from neighboring rural areas or hinterlands declines due to the unfavorable weather and the subsequent increase in food prices in the metropolis.

The second method of cultivation, extensive cultivation, involves the cultivation of indigenous staples like maize, cassava, pepper, tomatoes, peanuts and beans. This practice is dependent upon the prevailing rainfall pattern in Accra. Because it is rainfall-dependent, the cultivation of indigenous crops is confined to the wet seasons of September-November and April-June. Due to the agronomic requirement of crop spacing, the cultivation of indigenous crops requires considerable space and this explains why they are dominant in the urban periphery, where land is readily available. Sowing is by direct seeding on flat prepared ground. Since the dominant purpose of cultivating indigenous crops is for household consumption, indigenous growers do not invest or employ the use of intensive cultivation techniques. They rely on simple tools like cutlass and hoes, and use no (or occasionally, very limited) chemical fertilizer and pesticides. Most of these indigenous crops are not perishables; hence, they can be cultivated outside the inner city or far away from the market centers without any real concern for storage.
There are variations in the dimensions of the garden plots in Accra. Overall, the average size of garden plot cultivated by urban gardeners is 475.4 m² (which ranges between 37.2m² and 2034.8m²). However, urban gardens located in the inner city are smaller in size (mean of 286.9m²) than those located in the outer city (mean of 685.0 m²). A t-test analysis (t value = 3.87, df=58 and 2-tail=0.000) reveals that the difference of 398.12 m² between the mean sizes of garden plots in the inner city and outer city is statistically significant. The reason for the relatively smaller in the size of inner city garden plots can be explained by four factors. First, exotic crops are the dominant crop cultivated in the inner city and gardeners can achieve greater return per unit of land for such crop cultivation if the garden plot is smaller in size. Effective land management techniques and efficient intensive operations such as regular irrigation, soil tillage, land manuring, farm supervision, hand-picking weeds and bed-raising are more possible and viable on smaller size garden plots, and these produce greater returns. Cultivating smaller plots with greater returns is more cost-effective and profitable than cultivating larger plots with less efficient farm operations.

A second reason accounting for the smallness of garden plots in the inner city is the threat posed by land conversion and encroachment within the metropolis. The intense competition for land, coupled with rising land values, limits the potential of gardeners to expand the size of their garden plots in the inner city, not mentioning the threats posed to existing size. Thus, a gardener’s decision to cultivate smaller land size can be seen as an managerial response to the problem of land scarcity and high land cost in the city.

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3 The dimensions of the plot size were provided by gardeners during the questionnaire interview. However, some of these were cross-checked by actual measurements by the author and the research assistants.
Thirdly, most of the inner city gardens are sited in residential backyards, which are small in size, while the final reason pertains to women and their domestic responsibility. Women are the dominant cultivators in the inner city; hence, to be able to undertake this activity while performing household chores requires cultivation of small plots which they can easily manage. In brief, the smallness in the size of garden plots in the inner city can be attributed to four important factors - the encroachment of farmlands by residential development, the high returns associated with intensive cultivation of exotic crops on a smaller space, the smallness of residential backyards and the domestic responsibility of women.

Squatter lands have the largest average plot size of 633.12 m², followed in a descending order by custodian land (558.89 m²), lease land (479.30 m²), public land (417.37 m²), and farmer-owned land (414.82 m²). Interestingly, this trend relates inversely to the degree of security associated with the various land tenure types. Thus, one can conclude that the more secure a land is, the smaller is the size cultivated. This could be because most of the insecure lands (squatter lands and custodian lands) are located in the outer city where there is more land available for expansion. Furthermore, gardeners who cultivate the less secure land are likely to cultivate a larger space to insure them against, or compensate for, any unexpected loss or risk that may befall them.

It is possible that land size is influenced by how long a gardener has lived in Accra; thus, it is a research hypothesis that new arrivals are likely to have access to less land than long-time residents, and recent immigrants are more likely to cultivate smaller size plot than old immigrants. However, a correlation analysis reveals that there is no significant relationship (r=0.13 and p=0.331) between how long a gardener has stayed in Accra and the size of the garden plots cultivated. Thus, only 1.6% of the
variance in the size of the garden plots can be accounted for by how long a gardener has stayed in Accra. This result means that recent immigrants are not restricted in their ability to access more land for gardening as compared with the long-time immigrants or the local residents.

However, a correlation analysis between how long a gardener is involved in gardening and the size of garden plot cultivated reveals a correlation of $r=0.75$, indicating a strong relationship. This implies that 56% of the variance in the size of garden plot cultivated can be accounted for by how long a gardener is involved in gardening. Thus, the longer a gardener is involved in cultivation the larger is the size of the garden plot s(he) cultivates. This could be explained by the idea that the longer a gardener is involved in food cultivation the greater is the potential to explore land of larger size, consolidate his/her holdings on neighboring land or add to existing land by accretion. This outcome indicates that the duration of cultivation, rather than duration of stay in Accra, is the stronger factor in determining the size of garden plots to be cultivated. For instance, a gardener could have stayed in Accra for more than 20 years but only been involved in urban cultivation for the past 3 years while another gardener could have stayed in Accra for just 9 years but involved in cultivation for 7 years. It is highly likely that the latter gardener would have access to a larger plot than the former gardener due to his long experience in urban cultivation in Accra.

Table 5.5 reveals that the major source of farm labor is the gardeners themselves (58%) followed by their friends (17%). It was my hypothesis that gardeners are more likely to rely on family labor, and that the larger the size of their households the larger will be the land size they cultivate. However, it can be seen from the data (Table 5.5) that besides themselves, most gardeners rely more on other labor (friends and hiring) than on their family members. This is an indication that family labor has no
significant influence on the land size cultivated or the productivity of urban gardens. This is supported by a correlation value of $r=0.02$ which depicts a weak statistical relationship between family size and plot size.

On the other hand, the size of a garden plot is somewhat correlated with the extent to which a household depends on garden produce\(^4\) ($r=0.38$) and the percentage of household expenditure on food ($r=0.31$). The above indicates that, within the context of urban cultivation, family members cannot be perceived as productive units (because of a relatively weaker relationship between land size and household size) but a consumption unit (because of no relationship between land size and household expenditure on food and dependence on garden produce). So, in urban cultivation, a family's need for food, and not the size of family, has been the direct motivating factor in the expansion of garden plots. This is contrast to the situation in rural communities where the size of the family directly influences the size of cultivated land, as family members are perceived as productive units and a direct motivating factor in the expansion of farm land.

Table 5.5

Sources of Labor for Urban Gardening

<table>
<thead>
<tr>
<th>Source</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self</td>
<td>35</td>
<td>58</td>
</tr>
<tr>
<td>Friends</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>Family</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>Hiring</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Author's Field Survey, 1996

\(^4\) Gardeners were asked in the questionnaire to indicate the proportion of their garden produce they consumed.
5.3 Gender Analysis

In Africa, the informal sector is dominated by women. Traditionally, the female's role in the informal sector is counted as "non-economic" activity for the reason that they are mostly not renumerated. Hence, according to Rakodi (1988) and Lee-Smith (1993), the nature and organization of work undertaken by urban women are rarely discussed in the literature. Specifically, these authors assert that scant attention has been paid to the role of women in urban agriculture, despite its relevance to the understanding of household survival strategies, and especially to women's role in the production of food. In general, women predominate the management of subsistence, and this propelled Sanye (1991) to state that the "analysis of urban sustainability badly needs a gender analysis to make it complete as women are important resource base in the struggle to achieve sustainable development". It is important to explore the role of women in urban cultivation in light of the growing evidence of men's inability to earn sufficient income from the formal sector to guarantee household subsistence. In this respect, the study assesses the gender significance of urban agriculture in the AMA, and places it in the wider context of the gender division of labor in urban households in Accra.

Men and women are both active participants in urban gardening in the AMA. The survey reveals that, overall, statistically, there is no significant difference between the overall number of men (57%) and women (43%) involved in urban cultivation in Accra as revealed by a chi-square value of 1.06. This seems to contradict previous works by Freeman (1991), Maxwell and Zziwa (1992) and Rakodi (1988) whose surveys, mostly in East Africa, revealed that women are the dominant urban farmers. It should however be noted that, if the above gender data are placed within a spatial context, a different picture emerges as in the inner city, there are more
Fig. 5.3 Spatial Location of Urban Gardeners By Gender
women (57%) than men (43%) involved in urban cultivation (which supports the above authors' argument) but, in the outer city, there are more men (70%) than women (30%) involved (which contradicts the above authors' argument) as shown in Table 5.6. A chi-square analysis reveals a value of \( X^2 = 4.34 \) (df=1) which indicates a significant difference in the gender composition of urban gardeners between the inner city and the outer city (refer to Table 5.6). Thus, to better appreciate the gender composition of urban gardeners, it is more appropriate that such data are segregated over space, and not aggregated; hence, it is inappropriate to make general statements regarding gender composition of urban gardeners without specifying the location.

Table 5.6

<table>
<thead>
<tr>
<th>Gender</th>
<th>Inner city</th>
<th>Outer city</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>13</td>
<td>21</td>
<td>34 (57%)</td>
</tr>
<tr>
<td></td>
<td>43%</td>
<td>70%</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>17</td>
<td>9</td>
<td>26 (43%)</td>
</tr>
<tr>
<td></td>
<td>57%</td>
<td>30%</td>
<td></td>
</tr>
</tbody>
</table>

Chi-square = 4.34  
\[ p = 0.037 \text{ (SL)} \]

First row = actual number of gardeners  
Second row = column percentage

Source: Author's Field Survey, 1996.

It is important to explore why there is a preponderance of female gardeners in the inner city while male gardeners dominate the outer city. First, women find it more convenient to farm the inner city (particularly, the backyard or the neighborhood) so that, in addition to food cultivation, they can also attend to other domestic chores such as cooking, water fetching, child care and house cleaning. The closeness of gardens to
their residence enables them to effectively combine and perform, in time and space, both activities of gardening and household chores.

Secondly, women are often confronted with the problem of limited access to land as they are faced with the customary restriction of land inheritance. In this sense, the land tenure system discriminates against women, as it makes it difficult for them to have access to traditional lands, which are abound in the outer city, gardening. They are therefore restricted to backyard spaces or utility lands, which are mostly found in the inner city. Thirdly, the distance between the site of gardening and the place of abode is a constraining factor in women's ability to cultivate the urban periphery, even if they so wish. Gardens located in the outer city require frequent visits by gardeners to undertake daily operations as well as constant supervision to avoid theft. Women are restricted in their ability to commute every day to perform such garden operations in the light of their commitment to domestic chores and their children at home. Finally, for some women, the primary purpose of undertaking urban gardening is to supply or supplement essential food ingredients to the household kitchen, which could conveniently be done in their backyard space, close to their residence, without necessarily traveling to the urban periphery.

What is the motivation behind women's participation in urban cultivation in Accra? Women primarily participate in urban gardening to supplement the meager salary that their husbands bring to the household. With rising inflation and stagnating wages, earnings in the formal sector, which is the domain of men, are increasingly not able to sustain households in the AMA. Hence, the economic intervention of women, in the form of urban cultivation, has become an inevitable activity. In response to the

---

5 The people of Accra practice patrilineal system of inheritance where women cannot inherit family properties including land. This is in contrast to the Akan people in Ghana who practice matrilineal system of inheritance.
above predicament, women’s primary motive in urban cultivation in Accra, based on the survey result, is either to engage in subsistence cultivation to maintain household food self-sufficiency (19%), to reduce the level of household daily expenditure on food (12%), to generate income to meet the household budget (35%) or to supplement household income (7%). It is difficult to say whether women are more likely to cultivate for subsistence living or for income. But the investigation reveals that women who are heads of household, mostly single or divorced, tend to cultivate primarily for income to be able to acquire or afford other basic necessities such as children’s education, accommodation, and health. This group of women is solely responsible for providing all of their household needs, both food and non-food. On the other hand, married women or female gardeners who reside in households where men are the head tend to produce food to supplement their household nutritional needs, as their husbands take responsibility of other basic necessities. The collection of data to support this view was very difficult, as most women found the inquiry into their marital status very personal and offensive; hence, only a few of them collaborated.6

In some households where both sexes were actively involved in urban cultivation and the household food system, gender division of labor is clearly evident. Women normally play a significant role in the watering of the crop, home-based vegetable processing, food preservation and storage, and the marketing of food crops. It is also the functional role of women to be responsible for the daily preparation of food. As such women are confronted with the challenge of efficiently managing the preparation of food to ensure that it meets the daily food requirements of the household and is equitably distributed to family members. Men mostly participate in digging, weeding, and planting of the produce. Thus, gender division of labor still remains intact.

---

6 In Ghana, traditionally, women of marriageable age don’t want to be identified as single, as
Furthermore, most female gardeners view the cultivation of their backyard space as an inexpensive way of meeting their household food requirement, as their concern of the nutritional health of their children prompts them to engage in the cultivation of highly nutritious food. Available literature shows, for example, that the income of women has a greater impact on the health and nutrition status of children than the income of men (Maxwell, 1992). In the face of a limited household budget, women are often expected to reduce household expenditures by growing vegetables and cooking meals. Hence, the adaptation of any survival strategy in the face of a household food crisis and limiting budget hinges on women, and their ability to respond to such challenge defines the ability of the household to sustainably maintain itself during such a crisis.

Another factor that accounts for the active involvement of women in urban gardening is the declining rates of employment opportunity in Accra. Although the low employment situation has affected both men and women, the situation for women is more precarious as they are burdened with the enormous task of combining the inflexible working hours in the formal sector and the management of the domestic household. This situation makes it difficult for them to adjust to the rigid rhythm of formal employment. Furthermore, women engage in urban cultivation because it requires little start-up capital. Women are often faced with limited access to credit. Lending institutions often require prospective creditors to possess fixed assets, mostly in the form of land or a house, and since women are customarily not allowed to inherit land they often do not meet this requirement (Fong and Perrett, 1991). Even where consideration is given to women, they are often required by the credit institutions to

unmarried women are often perceived as lacking social responsibility.
have their husbands as the main signatory to the loan. Unfortunately, this also discriminates against single or divorced women.

With respect to the size of garden plot cultivated, the survey data indicate that female gardeners cultivate relatively smaller plot size (mean of 274 m²) as compared to their male counterparts (mean 639.0 m²). A t-test analysis reveals a value of 4.41 (df=58 and 2-tail=0.000), indicating that the difference of 443.9 m² between the mean plot sizes of male and female gardeners is statistically significant. Also, the average size of garden plot cultivated by female gardeners in both the inner and outer city is lower than that of their male counterparts (Table 5.6). In detail, Table 5.7 indicates that 53% of the female gardeners cultivated garden plots between 0-150 m² as compared with 12% of the male gardeners who cultivated a similar size range. On the other hand, a greater percentage of the male gardeners (29%) cultivated plots over 750 m² as compared with only 4% of female gardeners who cultivated plot this large. Fig.5.4 is a graphic representation of the distribution of the various dimensions of urban plots cultivated by male and female gardeners. Women's poor access to inherited land, domination in the cultivation of backyard space and commitment to domestic chores as well as the increasing pressure on inner city land are some of the factors accounting for why female gardeners cultivate relatively smaller land size vis-a-vis their male counterparts.
Fig. 5.4 Distribution of Land Sizes By Gender

Source: Author's Field Survey, 1996
Fig. 5.5 Land Tenure Types By Gender

Source: Author's Field Survey, 1996
With respect to the distribution of the various types of land tenure, the survey data indicate that most women cultivate land owned by their family (31%), followed by utility land (27%), leased/rented land (23%), squatter land (15%) and custodian land (4%) as shown in Fig.5.5. This trend indicates a positive relationship between the proportion of women involved in urban cultivation and the degree of security associated with land tenure. Thus, women tend to cultivate more secure lands compared to their male counterparts. This could be explained by the critical role women play in household

### Table 5.7

**Average Size of Garden Plots in Accra**  
(M²)

<table>
<thead>
<tr>
<th>Location/sex</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inner city</strong></td>
<td></td>
</tr>
<tr>
<td>Male gardeners</td>
<td>472.01</td>
</tr>
<tr>
<td>Female gardeners</td>
<td>145.44</td>
</tr>
<tr>
<td><strong>Outer city</strong></td>
<td>865.07</td>
</tr>
<tr>
<td>Male gardeners</td>
<td>806.14</td>
</tr>
<tr>
<td>Female gardeners</td>
<td>402.58</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>486.01</td>
</tr>
<tr>
<td>Male gardeners</td>
<td>639.07</td>
</tr>
<tr>
<td>Female gardeners</td>
<td>274.01</td>
</tr>
</tbody>
</table>

*Source: Author’s Field Survey, 1996*
Table 5.8

Distribution of Dimensions of Garden Plots By Gender (%)

<table>
<thead>
<tr>
<th>Category (m²)</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 150</td>
<td>12</td>
<td>54</td>
</tr>
<tr>
<td>151 - 300</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>301 - 450</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>451 - 600</td>
<td>18</td>
<td>6</td>
</tr>
<tr>
<td>601 - 750</td>
<td>23</td>
<td>5</td>
</tr>
<tr>
<td>Over 750</td>
<td>29</td>
<td>4</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Author's Field Survey, 1996

sustenance; hence, they do not like to take risks which may adversely impact their families. Thus, because the basis of their household survival, and especially that of their children, hinges on them it is safer for women to cultivate secure land that can guarantee their households a regular supply of food. Male gardeners are likely to be risk-takers as they cultivate garden plots with less security, such as custodian and squatter lands.

Furthermore, it has been the general assumption that the majority of women in the developing countries possess neither extensive schooling nor marketable skills, which restricts their access to formal sector employment, accounting for their prevalence in the urban informal sector (including urban agriculture). While this assumption may sound plausible in some cases, the field survey reveals that women cultivators are more educated than their male counterparts. The data indicate that 73% of the women gardeners have post-elementary education as compared to 65% of the
men; for post-secondary education, there were 4% of the women with that level of education while none for the men; and also there were more men (35%) than women (27%) without any formal education (Fig.5.6). Thus, although female gardeners are more educated than their male counterparts - a situation which should have made them more competitive on the job market - the restriction imposed by the inflexibility of combining formal employment with domestic chores has made it very difficult to obtain employment in the formal sector. This situation explains why women dominate the informal sector, specifically market trading and street vending.
Fig. 5.6 Level of Education of Urban Gardeners By Gender
Intra-Comparison

Source: Author's Field Survey, 1996
This chapter examines the role of urban cultivation in the household economy of gardeners in Accra. It shows how urban farming has contributed to household food supply and nutritional supplement, reduced the household food budget, and generated income and employment for the urban poor. In addition, the chapter examines the role that urban agriculture has played in the maintenance of the ecological integrity of Accra, specifically concerning waste management and flood abatement.

6.1. Contribution to the Household Economy

In Accra, urban agriculture plays a crucial role in the household sustenance of urban gardeners. It provides support in terms of food, income, and jobs. Gardeners indicated that their primary reasons for undertaking urban cultivation are to generate income\(^1\) (35%), produce food for direct household consumption (23%), supplement household income\(^2\) (17%), reduce household expenditure on food (12%) and hold onto land (8%). Only about 7% indicated that they are involved in urban cultivation as a hobby (Fig. 6.1). The extent to which urban cultivation is beneficial to the household economy differs in terms of gender, income, and the garden location.

\(^1\) These are full-time gardeners who are involved in urban cultivation solely to earn income. For these gardeners, their entire income comes from the sale of their garden produce.

\(^2\) These are gardeners who are involved in urban cultivation on a part-time basis purposely to earn income to supplement their dwindling earnings from their full-time jobs. These are mostly civil servants.
6.1.1 Household Food and Nutrition

Although the problem of malnutrition prevails both in the rural and urban areas, according to the UNDP (1996), persistent hunger is increasingly becoming more of an urban phenomenon than a rural problem in cities in developing countries - including Accra.

One of the primary objectives of urban gardening in Accra is to produce food for direct household consumption. About 22% of the urban gardeners surveyed indicated that their involvement in urban cultivation was primarily motivated by the desire to meet their household food needs. These gardeners rely partly on the urban market and partly on urban cultivation for household food supply. However, the significance of subsistence cultivation differs on the basis of where the garden is located. Table 6.1 and Fig. 6.2 indicate that 30% of all outer city gardens are purposely cultivated for direct household food supply while only about 13% of all inner city gardens are geared towards a similar objective. A statistical analysis of the relationship between the purpose of cultivation and the spatial location of urban gardens reveals a chi-square value of 11.32 (p = 0.45 SL and df = 5), which gives a strong statistical support to the assertion that more outer city gardens are geared towards subsistence cultivation than their counterparts in the inner city.

---

3 Food production for direct household consumption refers only to those who indicated that their primary purpose of cultivating is for food. This does not involve those who indicated that their primary motive is to save money. This later group (mostly middle income) have the ability (purchasing power) to acquire food on the market to sufficiently meet their household food requirements but decide to cultivate part of their food requirement to save money for non-food purposes. On the other hand, the former group cannot, in any way, meet their household food requirement without producing their own food. These are mostly low-income gardeners with less ability to rely on the market to sufficiently meet their household food requirements.
Fig. 6.1 Reasons For Cultivation By Urban Gardeners

Source: Author's Field Survey, 1996
Table 6.1

Cross Tabulation of Reasons for Cultivation by Garden Location (Percentage)

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Inner city</th>
<th>Outer city</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>13%</td>
<td>30%</td>
</tr>
<tr>
<td>Income</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>50%</td>
<td>20%</td>
</tr>
<tr>
<td>Income supplement</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>20%</td>
<td>13%</td>
</tr>
<tr>
<td>Save money</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>10%</td>
<td>13%</td>
</tr>
<tr>
<td>Hobby</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>Hold on land</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>0%</td>
<td>17%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

First row = actual number of gardens
Second row = column percentage
Chi-square = 11.32
p (sig. level) = 0.45

Source: Author's Field Survey, 1996

Table 6.2

Crop Type By Location

<table>
<thead>
<tr>
<th>Crop Type</th>
<th>Inner city</th>
<th>Outer city</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exotic crops</td>
<td>19</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>63%</td>
<td>43%</td>
</tr>
<tr>
<td>Indigenous crops</td>
<td>11</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>37%</td>
<td>57%</td>
</tr>
</tbody>
</table>

First row = actual number of garden plots
Second row = column percentage
Chi-square = 2.41
p (sig. Level) = 0.12

Source: Author's Field Survey, 1996.
Fig. 6.2 Primary Reasons of Cultivation Based on the Location of Garden Plot

Source: Author's Field Survey, 1996
This conclusion is reinforced by the fact that 57% of the garden plots in the outer city are used to cultivate indigenous crops meant for household consumption while, in the inner city, 63% of the garden plots are used to grow exotic crops to generate income (Table 6.2). Secondly, the cost of garden plots in the inner city is high; consequently, it is appropriately for gardeners to use such lands for intensive cultivation of income-generating crops.

A gender analysis revealed that, overall, there was no significant gender difference in the subsistence importance of urban cultivation in Accra as indicated by a chi-square value of 6.5 (p = 0.26) as shown in Table 6.3. However, if one considers this within a spatial context, then there is the tendency for female gardeners to be involved in subsistence production in the inner city than male gardeners as shown in Table 6.4. Thus, a greater proportion of the female gardeners who garden for subsistence reasons is found in the inner city than for male gardeners. This is because most of the female gardeners in the inner city cultivate their residential backyards to supply basic ingredients to their household kitchen (Table 6.4).
### Table 6.3

Cross Tabulation of Reasons of Cultivation By Gender (Percentage)

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>24%</td>
<td>19%</td>
</tr>
<tr>
<td>Income</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>35%</td>
<td>35%</td>
</tr>
<tr>
<td>Income suppl.</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>18%</td>
<td>7%</td>
</tr>
<tr>
<td>Save money</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>12%</td>
<td>12%</td>
</tr>
<tr>
<td>Hobby</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>0%</td>
<td>15%</td>
</tr>
<tr>
<td>Hold on land</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>12%</td>
<td>4%</td>
</tr>
</tbody>
</table>

First row = actual number of gardeners  
Second row = column percentage

Chi-square = 6.5  
p (sig. level) = 0.26

Source: Author's Field Survey, 1996

### Table 6.4

Subsistence Cultivation By Location and Gender

<table>
<thead>
<tr>
<th>Location</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner city</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>12%</td>
<td>60%</td>
</tr>
<tr>
<td>Outer city</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>88%</td>
<td>40%</td>
</tr>
<tr>
<td>Total</td>
<td>62%</td>
<td>38%</td>
</tr>
</tbody>
</table>

First row = actual number of garden plots  
Second row = column percentage

Source: Author's Field Survey, 1996
The survey also indicates that the proportion of gardeners involved in subsistence cultivation may probably increase with decreasing household income. For instance, a cross-tabulation (Table 6.5) reveals that about 27% of low income gardeners (54,000 cedis or less) are involved in urban cultivation for subsistence production, while 21% of the middle income gardeners (54,001-96,000 cedis) and none of the high-income (over 96,000 cedis) gardeners are involved in urban cultivation for a similar purpose. This trend suggests that urban agriculture is an important subsistence activity of the urban poor, as, proportionally, there are relatively more low-income gardeners involved in subsistence production in comparison with middle-income and high-income gardeners. The importance of subsistence cultivation for the urban poor is also portrayed in Table 6.6, which shows that, in comparison with middle and high income groups, the low income group tends to depend more on their garden produce for direct consumption.

Although urban cultivation is unlikely to meet the entire household food requirement of most urban gardeners in Accra, the above analyses show that urban cultivation can go a long way towards reducing the food insecurity of the urban poor, as well as enhance their self-sufficiency. This view is supported by a direct question which asked gardeners whether would they have been able to meet their household food requirement without engaging in urban cultivation, of which 60% responded “No” while only 27% indicated “Yes” (the rest were not sure of their response).

---

4 These income brackets were adopted from Ghana Statistical Service Report, 1995.
Table 6.5

Cross Tabulation of Reasons of Cultivation By Income Groups
(Percentage)

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Low income</th>
<th>Middle income</th>
<th>High income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>9</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>27%</td>
<td>21%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>10</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>29%</td>
<td>32%</td>
<td>71%</td>
<td></td>
</tr>
<tr>
<td>Income supplement</td>
<td>6</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>18%</td>
<td>16%</td>
<td>14%</td>
<td></td>
</tr>
<tr>
<td>Save money</td>
<td>1</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>3%</td>
<td>26%</td>
<td>14%</td>
<td></td>
</tr>
<tr>
<td>Hobby</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>9%</td>
<td>6%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Hold on land</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15%</td>
<td>0%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td>19</td>
<td>7</td>
</tr>
</tbody>
</table>

First row = actual number of urban gardens
Second row = column percentage

Chi-square = 15.29
p (sig. level) = 0.12

Source: Author's Field Survey, 1996
Table 6.6

Proportion of Garden Produce Consumed By Income Group

<table>
<thead>
<tr>
<th>Proportion Consumed</th>
<th>Low income</th>
<th>Middle income</th>
<th>High income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much (60 - 100%)</td>
<td>9</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>27%</td>
<td>19%</td>
<td>29%</td>
</tr>
<tr>
<td>Some (10 -25%)</td>
<td>22</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>65%</td>
<td>63%</td>
<td>43%</td>
</tr>
<tr>
<td>None (0%)</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>9%</td>
<td>16%</td>
<td>29%</td>
</tr>
</tbody>
</table>

First row = actual number of gardeners  
Second row = column percentage  
Chi-square = 8.50  
p (sig. level) = 0.38

Source: Author's Field Survey, 1996

On the basis of income, in a descending order, 79% of the low income gardeners, 37% of middle income gardeners and 29% of high income gardeners indicated that they would not have been able to meet their household food requirement without engaging in urban cultivation. On the basis of gender, 65% of the female gardeners responded "No" while 59% of the male gardeners provided similar response. In brief, urban cultivation has the potential for reducing the vulnerability of the urban poor by promoting self-production of food they could not otherwise afford on the urban market. Thus, urban cultivation insulates the urban poor from the restrictions imposed by the urban market. Besides, the cultivation of food closer to their home provides gardeners the means of preserving food quality and retaining its nutritional value compared with food produced from outside the city, which loses much of its nutritional value in transit and storage (especially in the case of perishable vegetables). Furthermore, local production improves physical access to food because
it reduces, if not eliminates, costs associated with transportation and storage. Thus, urban cultivation enables the urban poor to gain control over the quantity, quality and stability of the household food supply. By reducing hunger and malnutrition, urban farming contributes to the promotion of health and the productivity of the urban poor.

6.1.2 Food Budget and Household Expenditure

Rising food prices have been a significant factor in undermining the food security of the urban poor, as household vulnerability to food insecurity grows when the share of household budget on food rises. A survey by Ghana Statistical Service (GSS) in 1995 reveals that 48.5% of the household income in Accra is spent on food and beverages (Table 6.7).

Whereas the above data imply that food constitutes the largest share of the consumption expenditure of the residents in Accra, on the basis of income, the field survey reveals that low-income earners spend more on food than their middle-income and high-income counterparts (Table 6.8 and Fig 6.3). For instance, in a decreasing order, 50% of the low-income earners, 21% of the middle-income earners and 0.0% of the high-income earners spend over 60% of their monthly income on food. On the other hand, for those who spend less than 30% of their monthly income on food, there are more high-income earners (100%) than middle-income (32%) and low-income earners (9%) - this trend shows that more high income gardeners spent less income on food.
Table 6.7

Household Budget Shares (%)

<table>
<thead>
<tr>
<th>Item</th>
<th>Accra</th>
<th>Other Urban</th>
<th>Rural Forest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food and Beverages</td>
<td>48.5</td>
<td>48.8</td>
<td>47.0</td>
</tr>
<tr>
<td>Alcohol and Tobacco</td>
<td>1.4</td>
<td>2.1</td>
<td>3.7</td>
</tr>
<tr>
<td>Clothing and Footwear</td>
<td>10.9</td>
<td>8.0</td>
<td>11.9</td>
</tr>
<tr>
<td>Housing and Utilities</td>
<td>10.8</td>
<td>9.8</td>
<td>7.5</td>
</tr>
<tr>
<td>Household Goods</td>
<td>7.6</td>
<td>6.2</td>
<td>8.1</td>
</tr>
<tr>
<td>Medical and Health</td>
<td>2.5</td>
<td>3.7</td>
<td>5.4</td>
</tr>
<tr>
<td>Transport and Comm.</td>
<td>7.7</td>
<td>6.1</td>
<td>7.7</td>
</tr>
<tr>
<td>Recreation and Education</td>
<td>5.0</td>
<td>5.9</td>
<td>4.2</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>5.6</td>
<td>9.4</td>
<td>3.6</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Ghana Statistical Service, March 1995

Thus, there are disproportionately more low-income earners who spend more of their monthly income on food as compared with the other income groups. One can thus conclude that the lower the household income the higher the proportion of income spent on food. Thus, food constitutes the largest portion of the consumption basket of the urban poor as it attracts more of their household budget. This is confirmed by a chi-square analysis, which reveals a value of $X^2 = 26.07$ ($p = 0.00$), indicating the relationship to be statistically significant. This relationship conforms to Engel's law, which states that the share of expenditure devoted to food can be expected to rise with a decrease in total income. However, on the basis of gender, a chi-square analysis reveals that, statistically, there is no significant difference between the proportion of income spent on food by male and female gardeners.
Fig. 6.3 Percentage of Income Spent on Food By Income Group

Source: Author's Field Survey, 1996
Table 6.8

Percentage of Monthly Income Spent on Food By Income Group

<table>
<thead>
<tr>
<th>Perc. of income spent on food</th>
<th>Low-income</th>
<th>Middle-income</th>
<th>High-income</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 29%</td>
<td>3 (9%)</td>
<td>9 (47%)</td>
<td>7 (100%)</td>
</tr>
<tr>
<td>30 - 59%</td>
<td>14 (41%)</td>
<td>6 (32%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Over 60%</td>
<td>17 (50%)</td>
<td>4 (21%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>34</td>
<td>17</td>
<td>7</td>
</tr>
</tbody>
</table>

First row = actual number of gardeners
Second row = column percentage
Chi-square = 26.07
p (sig. level) = 0.00

Source: Author's Field Survey, 1996

The extent to which urban gardeners cultivate to reduce their household expenditure on food can be derived from Fig. 6.1, where it is shown that about 12% of the gardeners indicated that they are involved in urban cultivation primarily to save money. On the basis of gender, an almost equal proportion of male (11.8%) and female (11.5%) gardeners provided this response. However, on the basis of income groups, relatively more of the middle income group (5 respondents) than low income group (1 respondent) and high income group (1 respondent) cultivate for the purpose of saving money. Thus, middle-income gardeners dominated in this response. This is because, beside cultivating for income, most middle-income gardeners, who are public servants, are involved in farming purposely to cultivate part of their household food requirement to save money for non-food uses. This is in contrast to low-income gardeners who
cultivate mainly for household direct consumption and income as shown in Tables 6.5 and 6.6).

Cross-referencing the proportion of garden produce consumed by households with the proportion of monthly income gardeners spend on food reveals almost similar proportion of gardeners (who spend various proportions of their income of food) consumed a quarter or more of their garden produce (Table 6.9). Thus, 55.6% of the gardeners who spend 0-29% of their monthly income on food consumed a quarter or more of their garden produce, 60% of those who spend 30-59% of the monthly income on food consumed similar proportion, while 54.5% of them who spend over 60% of their income on food consumed the same proportion.

Table 6.9

<table>
<thead>
<tr>
<th>Prop. consumed</th>
<th>Proportion of income spent on food</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-29%</td>
</tr>
<tr>
<td>all (100%)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>6%</td>
</tr>
<tr>
<td>much (60-95%)</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>22%</td>
</tr>
<tr>
<td>some (25-55%)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>28%</td>
</tr>
<tr>
<td>little (10-25%)</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>39%</td>
</tr>
<tr>
<td>none (0%)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>11%</td>
</tr>
</tbody>
</table>

First row = actual number of gardeners  
Second row = column percentage  
Chi-square = 7.44  
p (sig. level) = 0.48

Source: Author's Field Survey, 1996
Although the author could not compute the actual value of the home-produced food consumed by the gardeners, the Ghana Statistical Service (GSS) provides useful data on this for Accra and other urban centers in Ghana in 1995 (Table 6.10). According to the GSS, in 1995, the value of home-produced food consumed monthly by households in Accra was 2,409.00 cedis and per capita of 662.00 cedis, while the total annual value of home-produced food consumed by households for all urban centers in Ghana was 54,755 million cedis. This is an enormous amount of money saved by the various households directly involved in the production of their own food.

The significance of the money saved by the urban gardeners can be seen in the way they spend saved money. Twenty-five percent of the gardeners indicated that, as their first priority, they spend saved income on rent, 22% indicated children’s education, 20% pointed to health and medical expenses, 12% of the gardeners spend the money saved to obtain fruit and meat, 10% indicated clothing, 8.7% transportation and 5% chose banking (Fig.6.4). Thus, housing constitutes the most significant resource use of saved money, followed by education, health, extra nutrition, clothing and transportation. Putting such money in the bank is the least likely alternative for them.

There is the tendency for various income groups to differ on how they spend saved income. For low-income group, education (27%) constitutes the most important priority, payment of rent (42%) is the most important priority for the middle-income group, while for the high-income group clothing (43%) is the highest priority (Table 6.11). This is statistically significant as indicated by a chi-square value of 20.98 and \( p = 0.05 \)
### Table 6.10

Monthly Value of Home-Produced Food in Accra and Other Urban Centers in Ghana.
(in Cedis)

<table>
<thead>
<tr>
<th>Item</th>
<th>ACCRA</th>
<th>OTHER URBAN</th>
<th>Annual consumption*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Household consumption</td>
<td>Per capita</td>
<td>Household consumption</td>
</tr>
<tr>
<td>Cereals/products</td>
<td>96</td>
<td>26</td>
<td>7,663</td>
</tr>
<tr>
<td>Root and tubers</td>
<td>1,529</td>
<td>421</td>
<td>43,923</td>
</tr>
<tr>
<td>Pulses and nuts</td>
<td>261</td>
<td>72</td>
<td>4,251</td>
</tr>
<tr>
<td>Vegetables</td>
<td>67</td>
<td>18</td>
<td>4,051</td>
</tr>
<tr>
<td>Fruits</td>
<td>252</td>
<td>69</td>
<td>3,077</td>
</tr>
<tr>
<td>Poultry/products</td>
<td>204</td>
<td>56</td>
<td>1,399</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>2,409</strong></td>
<td><strong>662</strong></td>
<td><strong>64,364</strong></td>
</tr>
</tbody>
</table>

---

Source: Ghana Statistical Service, March 1995

- This is an estimate of the value of annual total consumption of home-produced food in Ghanaian cities.
- The GSS survey involves more than 4,500 households, containing over 20,000 persons.
Fig. 6.4 How Gardeners Spend Saved Money From Urban Cultivation

Source: Author's Field Survey, 1996
This trend somewhat follows the Maslow’s hierarchy of needs. On the basis of gender, there was no statistical significant difference between the expenditure pattern of male and female gardeners on how to use such saved money (Table 6.12).

Table 6.11
How Gardeners Spend Saved Money By Income Group

<table>
<thead>
<tr>
<th>Needs</th>
<th>Low income</th>
<th>Middle income</th>
<th>High income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent</td>
<td>6</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>18%</td>
<td>42%</td>
<td>14%</td>
</tr>
<tr>
<td>Transportation</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>3%</td>
<td>16%</td>
<td>0%</td>
</tr>
<tr>
<td>Clothing</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>9%</td>
<td>0%</td>
<td>43%</td>
</tr>
<tr>
<td>Extra Food</td>
<td>5</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>(meat/fruit)</td>
<td>15%</td>
<td>11%</td>
<td>0%</td>
</tr>
<tr>
<td>Health</td>
<td>8</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>24%</td>
<td>16%</td>
<td>14%</td>
</tr>
<tr>
<td>Education</td>
<td>9</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>27%</td>
<td>16%</td>
<td>14%</td>
</tr>
<tr>
<td>Banking</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>6%</td>
<td>0%</td>
<td>14%</td>
</tr>
</tbody>
</table>

First row = actual number of gardeners
Second row = column percentage

Chi-square = 20.98
p (sig. level) = 0.05

Source: Author’s Field Survey, 1996
Table 6.12

How Gardeners Spend Saved Money By Gender

<table>
<thead>
<tr>
<th>Needs</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>26%</td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>6%</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>Clothing</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>9%</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>Extra Food</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>(meat/fruit)</td>
<td>15%</td>
<td>8%</td>
</tr>
<tr>
<td>Health</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>26%</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>15%</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>Banking</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3%</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>34</td>
<td>26</td>
</tr>
</tbody>
</table>

First row = actual number of gardeners
Second row = column percentage

Chi-square = 4.93
p (sig. level) = 0.55

Source: Author’s Field Survey, 1996.

The above is an indication of the crucial role home food production can play not only in meeting household food and nutrition requirements but also by reducing household expenditure on food and providing the means to meet the needs of education, health and housing - the basis of sustainable development.
6.1.3 *Income Generation and Profit-Making*

As an adjusting mechanism to the declining real income due to price inflation, some urban residents have resorted to commercial cultivation of vegetables to supplement their income. Even civil servants who are assured of regular and stable income have seen their purchasing power dwindle in the face of rising food prices, and one of the significant response among them has been the commercial cultivation of exotic crops. According to Ghana Statistical Services (1995), household agricultural income constitutes 15.6% of the total household income for all urban communities in Ghana - this is the third largest source after non-farm self employment income (49%) and wage income from formal employment (24.4%). Other sources of income are remittance (5.4%) and rental income(0.8%).

On the basis of gender, an almost similar proportion of male (52.9%) and female gardeners (50.0%) are involved in urban cultivation to generate income or supplement household income. On the basis of income group, proportionally, there are more high-income gardeners (85.7%) who are involved in commercial cultivation (income and income supplement) than middle-income (47.4%) or low-income gardeners (47%) as shown in Table 6.5. One can suggest that, having been able to meet their basic food needs, high income gardeners are interested in acquiring other needs; hence, they are interested in commercial cultivation to earn income to achieve this purpose. It is the author's observation that for the low- and middle-income gardeners, the motive behind commercial cultivation of exotic crops is mainly to earn income to buy their household's basic necessities. For the high-income group, the motive for commercial cultivation is mainly to make reasonable profit, after covering their high cost of production.
Another means of exploring the extent to which urban agriculture contributes to the cash flow of the gardeners is to assess the proportion of their total monthly income derived from the sale of their produce. As shown in Fig. 6.5, 21.7% of the gardeners indicated that they derived almost entirely (over 95%) their total monthly income from the sale of their produce while 15% of the gardeners indicated that they derived approximately three-quarters (75%-90%) of their monthly income from the sale of their produce. Another 30% also indicated that they derived approximately half (30%-50%) of their total monthly income from their garden sales while 6.7% derived approximately one-quarter (10%-25%) of their monthly income from the sale of their produce. Thus, urban cultivation not only generates income to the gardeners but such income constitutes a significant portion of their household income, as more than half of the gardeners received more income from urban cultivation than they do receive from any other source.

A cross-tabulation of proportion of farm income to total income and reason for farming reveals the tendency for more of the gardeners who farm for income (including income supplement) to have higher proportion of farm income to total income than gardeners who cultivate for food (including saving money). For instance, 51.6% of the commercial gardeners derive three-quarter or more of their total income from the sale of their garden produce, as compared with 30% of those who cultivate for food and to save money (Table 6.13).
Fig. 6.5 Percentage of Farm Income To Total Income

Source: Author's Field Survey, 1996
Table 6.13

Proportion of Farm Income To Total Income By
Reason for Farming

<table>
<thead>
<tr>
<th>Proportion</th>
<th>For Income</th>
<th>For Food + Save Money</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 95%</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>75-95%</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>30-50%</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>25% and less</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>20</td>
</tr>
</tbody>
</table>

First row = actual number of gardeners  
Second row = column percentage  
Chi-square = 26.25  
p (sig. level) = 0.15

Source: Author's Field Survey, 1996.

The survey shows that the higher the income of a gardener, the higher the proportion of his/her farm income to total income, as shown in Table 6.14. Thus, if the proportion of the farm income to total income is considered at 75% or more, then there are more high-income gardeners than low-income gardeners in that category. However, if the proportion is considered at 50% or less, then there are more low-income gardeners than high-income gardeners in that category. Thus, overall, there is the greater possibility that gardeners with high income are more likely to derive more of their income from urban cultivation. This is because high-income gardeners are mostly commercial cultivators who employ improved cultivation methods, invest in land improvement and market research, explore the export market, receive credit from banking institutions and benefit from technical assistance offered by the Extension
Service; hence, the returns from their gardens are much higher than that of their low-income counterparts.

**Table 6.14**

Proportion of Farm Income To Total Income
By Income Groups (%)

<table>
<thead>
<tr>
<th>Proportion</th>
<th>Low income</th>
<th>Middle income</th>
<th>High income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 95%</td>
<td>6</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>18%</td>
<td>32%</td>
<td>14%</td>
</tr>
<tr>
<td>75% - 90%</td>
<td>5</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>15%</td>
<td>5%</td>
<td>43%</td>
</tr>
<tr>
<td>30% - 50%</td>
<td>13</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>38%</td>
<td>21%</td>
<td>14%</td>
</tr>
<tr>
<td>25% and less</td>
<td>10</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>29%</td>
<td>49%</td>
<td>29%</td>
</tr>
</tbody>
</table>

Chi-square = 9.94 p (sig. level) = 0.26

Source: Author's Field Survey, 1996

**Table 6.15**

Proportion of Farm Income To Total Income
By Gender (%)

<table>
<thead>
<tr>
<th>Proportion</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 95%</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>21%</td>
<td>23%</td>
</tr>
<tr>
<td>75% - 90%</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>30% - 50%</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>38%</td>
<td>19%</td>
</tr>
<tr>
<td>25% and less</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>15%</td>
<td>18%</td>
</tr>
</tbody>
</table>

First row = actual number of gardeners  
Second row = column percentage

Chi-square = 3.74 p (sig. level) = 0.44

Source: Author's Field Survey, 1996
An attempt was made to assess the profitability of urban agriculture in Accra through income and expenditure accounting. It should be admitted that most gardeners interviewed do not keep proper accounts of their farming operations. However, following the farm accounting procedure of the Extension Service Division of the Ministry of Food and Agriculture, five of the gardeners kept an accounting record of their income and expenditure associated with their farming operations. Four of these accounting records, representing four of the tenurial arrangements, were selected for a profitability assessment as well as to explore factors that significantly influence the level of profit (refer to Table 6.16).

Gardener A is a tenant gardener in the inner city who is involved in urban cultivation mainly for profit. She incurred costs pertaining to almost all aspects of her farming operations - the uses of land, labor, irrigation, organic manure, insecticides, seeds/seedlings, farm implements, storage and transportation. Consequently, her cost of production per garden bed (6,815.00 cedis) is the highest. However, because she employed an improved, intensive production method, her garden plot yielded the highest return (10,500.00 cedis).

Gardener B is a squatter gardener who cultivated a costless vacant plot, relied on his own labor, had access to costless stream water for irrigation and did not use pesticides or insecticides. His costs of production include only the purchase of organic manure, seedlings, farm implements and the transportation of farm produce to the market. Hence, his cost of production is the least among the four gardeners.

Gardener C is a utility gardener who cultivated land close to a nearby stream aligning a road. Like Gardener B, he did not incur cost to use the land. He relied on his own labor and did not incur costs of transportation as he is involved in street marketing. He had access to costless stream water to irrigate his crops but employed an improved,
intensive method of production, hence, and incurred costs for organic manure, insecticides, seedlings, farm implements and storage.

Finally, Gardener D is a land-owner gardener who paid for pipe water used to irrigate her crops and incurred costs for organic manure, insecticides, seedlings, farm implement and storage. However, she did not have to pay to use the family land, and she relied solely on her labor.

In comparison, the squatter gardener (Gardener B) earned the highest profit because his cost of production was the least. This is because, although he had the least revenue (due to the less improved production method), the squatter gardener’s cost of production was very low and this enabled him to earn considerably more profit than Gardener A, although the latter recorded the highest revenue.

It should be noted that, although the squatter gardener (Gardener B) derived the most profit, in comparison with the others, he is confronted with the greatest risk of harassment, crop destruction and unexpected eviction by the metropolitan authorities; hence, his ability to make a similar level of profit in subsequent seasons is highly unpredictable. The earnings of a squatter gardener can easily oscillate from a high profit to a substantial loss within a short period due to the great risk he exposes his activity to. Gardener A (tenant gardener) and Gardener D (land-owner gardener), are faced with the least threat from the metropolitan authority, as they incurred extra costs to guarantee security and a legal operation. Consequently, these extra costs reduce their profit margin but ensure them more predictable earnings.
Table 6.16

Profitability Assessment of Urban Gardening in Accra

<table>
<thead>
<tr>
<th>Gardener A</th>
<th>Gardener B</th>
<th>Gardener C</th>
<th>Gardener D</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sale for one bed</td>
<td>10,500.00</td>
<td>7,070.00</td>
<td>7,560.00</td>
</tr>
<tr>
<td><strong>Expenditure:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>land rental</td>
<td>540.00</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>hired labor</td>
<td>1,600.00</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>water (3 bucket/day)</td>
<td>1,200.00</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>organic manure/fertilizer</td>
<td>820.00</td>
<td>440.00</td>
<td>480.00</td>
</tr>
<tr>
<td>insecticides</td>
<td>750.00</td>
<td>---</td>
<td>700.00</td>
</tr>
<tr>
<td>seeds/seedlings</td>
<td>980.00</td>
<td>620.00</td>
<td>650.00</td>
</tr>
<tr>
<td>farm implements</td>
<td>300.00</td>
<td>280.00</td>
<td>330.00</td>
</tr>
<tr>
<td>storage/refrigeration</td>
<td>250.00</td>
<td>---</td>
<td>200.00</td>
</tr>
<tr>
<td>transportation</td>
<td>375.00</td>
<td>380.00</td>
<td>---</td>
</tr>
<tr>
<td><strong>PROFIT:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenue less expenditure</td>
<td>3,685.00</td>
<td>5350.00</td>
<td>5,200.00</td>
</tr>
</tbody>
</table>

Source: Gardeners' Accounting Records, 1996
Thus, two profit scenarios can be identified; one, a situation of a relatively high, but unpredictable profit margin associated with less secure land tenure such as squatter gardening; and two, a situation of relatively low, but predictable profit associated with more secure land tenure such as tenant or land-owner gardening. The basis for the differences in the profit making is the cost and effort made by gardeners to achieve some degree of security pertaining to use of land and protecting their crops from official harassment.

Another significant factor that determines profit margin is the season of cultivation. Gardeners gain a lot of revenue from the sale of their produce during the dry season of December to March. Two factors account for the high revenue in the dry season. On the demand side, the dry season coincides with the Christmas and the New Year festivities, periods when urban households increase their purchase of vegetables and spices to prepare dishes for the occasion. On the supply side, since food production from rural areas is dependent on rainfall, food production declines in the dry season. Consequently, prices of food on the urban market rise in response to this short-fall, and this goes to benefit urban gardeners who rely on stream water or pipe water to produce crops in the dry season. Thus, urban gardeners reap substantial profit during this period as they face less competition from the rural supply. For instance, the price of a bunch of carrot sells for 2,600.00 cedis in the wet season but this increases to 4,440.00 cedis in the dry period of December to March\(^5\). Four pieces of lettuce sells for 2,000.00 cedis in the wet season and 3,800.00 cedis during the lean season. It is even common among some gardeners to cultivate only in the dry season to be guaranteed more profit than in the wet season when they sometimes experience a loss.

\(^5\) Prices of some vegetables were observed at the Accra's central market (31\(^{st}\) December Market) during the wet and the dry seasons.
The type of vegetables cultivated also influences the profit margin of vegetable production. Vegetables, such as cabbages and lettuce, are popular among consumers, and hence attract a high price, whereas carrots and radish earn lower prices as they are less popular. The profitability of a crop is also influenced by its exportability, as gardeners are able to earn foreign exchange from the sale of their produce. The Ministry of Food and Agriculture has liaised with the Export Promotion Council to encourage farmers to grow pineapples, pepper, ginger, and coconut for export. The promotional effort involves the provision of the improved inputs, technical-know how, consumer information and credit facilities to growers to produce high quality crops to compete on the world market. The Export Promotion Council (EPC) is also promoting the exportation of green chillies to the Asian ethnic markets in Europe. Currently, the peri-urban areas produce large amounts of red pepper and pineapples which are beginning to enter the non-traditional export market.

The profitability of urban cultivation is summarized by the Ministry of Agriculture Extension Service statistics which reveals that, in June 1986, on the average, a part-time gardener realized 21,570 cedis a year from the sale of carrots, lettuce and cabbage, or alternatively 1,798.00 a month which compares well with 2,696.25 a month for full-time minimum wages.

There was an absence of data on aggregate earnings for all urban gardeners in Accra; however based on the field data, the author was able to estimate the total earnings of the 60 gardeners interviewed. As shown in Fig. 6.17, the calculation involves the following steps. First, the gross earnings per bed per cultivation for the four

---

6 In spite of being less popular in demand, carrots and radish are grown because of their low cost of production.
7 The amount 1,798.00 cedis represent the total monthly earning of a gardener for 1986 for the cultivation of carrots, lettuce and cabbage. The per capita earning of 662 cedis shown in Table 6.11 represents the amount earned by each member of the gardener's household.
categories of gardeners were derived from Table 6.16. Since custodian gardening has similar operational characteristics as squatter gardening, the gross earning per bed for squatter gardeners was also applied to custodian gardeners. The average number of beds cultivated by gardeners was calculated to be six; hence, the gross earning of each of the gardening category was multiplied by six to arrive at total earning per cultivation for each of the gardening category. On average, gardeners cultivate their plots thrice a year; hence, the gross earning per cultivation was multiplied by three to arrive at annual gross earning for each category of gardeners. This was multiplied by the number of gardeners involved in commercial cultivation in that category. The outcomes for all the categories were summed up to arrive at total earning for all commercial cultivators. The computation reveals an estimated amount of 4,596,120 cedis, being the total earning of commercial gardeners interviewed.
Table 6.17

Calculation of Annual Earnings of Commercial Gardeners Interviewed (An Estimates)

<table>
<thead>
<tr>
<th></th>
<th>Tenant</th>
<th>Squatter</th>
<th>Utility</th>
<th>Ownership</th>
<th>Custodian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross earnings per bed</td>
<td>10,500</td>
<td>7,070</td>
<td>7,560</td>
<td>7,600</td>
<td>7,070</td>
</tr>
<tr>
<td>Av. bed per gardener</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Earnings per gardener</td>
<td>63,000</td>
<td>42,420</td>
<td>45,360</td>
<td>45,600</td>
<td>42,420</td>
</tr>
<tr>
<td>Av. # of cultivation per year</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Annual earnings per gardener</td>
<td>189,000</td>
<td>127,260</td>
<td>136,080</td>
<td>136,800</td>
<td>127,260</td>
</tr>
<tr>
<td>No. of commercial gardeners</td>
<td>8</td>
<td>3</td>
<td>7</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Total earnings</td>
<td>1,512,000</td>
<td>381,780</td>
<td>952,560</td>
<td>1,368,000</td>
<td>381,780</td>
</tr>
</tbody>
</table>

SUM OF EARNINGS = 4,596,120.00
6.1.4 Employment and the Multiplier Effects.

Unemployment is one of the problematic outcomes of the urbanization process in Accra. The rapid rate of rural-urban migration and stagnant economic growth, coupled with the implementation of the re-deployment and the redundancy policies of the Structural Adjustment Program, have led to a serious problem of labor unemployment or underemployment in the formal sector in Accra. The growing economic threat of urban unemployment has provided a boost to the growth of the urban informal sector, of which urban cultivation is a part.

The importance of agriculture as an employment opportunity in Accra, especially for the urban poor, is clearly evident in Accra Planning Development Program's (APDP) employment projection between 1984 and 1995 (Table 6.18). The data indicate that 61,700 of the residents of Greater Accra Metropolitan Area were employed in the agricultural sector in 1984, and this figure was projected to increase by 26% to 77,810 in 1995. Overall, between 1984 and 1995, general employment was projected to increase by 140%. On the average, 67,200 new jobs were expected to be created every year for the period 1984 to 1995, of which 1,470 were expected in agriculture, 36,890 in the service sector, and 28,820 in the industrial sector (APDP, 1992). Although the figure for agriculture is relatively small, it is very significant from the point of view of reducing poverty, as the sector employs low-income residents. That is, while the service and manufacturing sectors will exclude the marginalized, uneducated and the low-income individuals in their employment, the agricultural sector becomes the hope for such group of people. It should be noted that Table 6.18 only reflects full-time employment; however, there are many residents working in the industrial and the service sectors who are engaged in urban farming on a part-time basis. Hence, the employment potential of urban agriculture is much greater than these figures indicate.
The agricultural employment figures in Table 6.18 include those directly involved in agriculture as well as those who are not directly involved in urban cultivation but who are related to the sector by virtue of providing formal support service. The latter group includes extension officers, crop inspectors and project managers. Table 6.19 provides the actual and projected number of people who are directly involved in urban cultivation (urban farmers) in the City of Accra between 1984 and 1995. The employment growth potential of urban agriculture in Accra can be seen from the increase in the actual number of urban gardeners by 19,286 from 41,470 in 1984 to 60,756 in 1995 and the percentage increase, which rose from 16.95% (between 1984 to 1990) to 17.80% (between 1990 to 1995). However, in spite of the growth of actual numbers and percentage increases, the data (Table 6.19) indicate a steady decline in the share of urban farmers in Accra.
Table 6.1

<table>
<thead>
<tr>
<th>Year</th>
<th>Agriculture</th>
<th>Industry</th>
<th>Service</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>61,700</td>
<td>135,550</td>
<td>344,830</td>
<td>524,080</td>
</tr>
<tr>
<td>1985</td>
<td>63,660</td>
<td>165,370</td>
<td>382,830</td>
<td>611,890</td>
</tr>
<tr>
<td>1986</td>
<td>65,305</td>
<td>181,910</td>
<td>413,380</td>
<td>660,590</td>
</tr>
<tr>
<td>1987</td>
<td>66,950</td>
<td>201,920</td>
<td>471,260</td>
<td>740,130</td>
</tr>
<tr>
<td>1988</td>
<td>68,600</td>
<td>220,090</td>
<td>513,670</td>
<td>802,060</td>
</tr>
<tr>
<td>1989</td>
<td>70,250</td>
<td>239,900</td>
<td>549,630</td>
<td>859,780</td>
</tr>
<tr>
<td>1990</td>
<td>71,900</td>
<td>263,890</td>
<td>582,600</td>
<td>918,390</td>
</tr>
<tr>
<td>1991</td>
<td>73,080</td>
<td>290,780</td>
<td>617,560</td>
<td>981,420</td>
</tr>
<tr>
<td>1992</td>
<td>74,260</td>
<td>330,920</td>
<td>648,440</td>
<td>1,053,620</td>
</tr>
<tr>
<td>1993</td>
<td>75,440</td>
<td>367,320</td>
<td>680,860</td>
<td>1,123,620</td>
</tr>
<tr>
<td>1994</td>
<td>76,630</td>
<td>407,720</td>
<td>714,900</td>
<td>1,199,250</td>
</tr>
<tr>
<td>1995</td>
<td>77,810</td>
<td>452,570</td>
<td>750,650</td>
<td>1,218,270</td>
</tr>
</tbody>
</table>

Source: Accra Planning and Development Programme, 1991

The importance of urban cultivation as a means of employment in Accra is also depicted in Table 6.20, which reveals that in 1984, agriculture was the third largest employer in the informal sector\(^8\). Furthermore, 68% of the employment in the agricultural sector are informal jobs, making the informal sector more receptive to agricultural employment than the formal sector.

---

\(^8\) The APDP used informal sector agriculture to refer to urban farmers, poultry-keepers and fishermen.
Table 6.19

An Estimate of the Number of Urban Farmers in the City of Accra, 1984-1995

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Employment</th>
<th>Urban gardeners</th>
<th>Urban gardeners as % of total</th>
<th>% of growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>393,978</td>
<td>41,470</td>
<td>10.53</td>
<td>-</td>
</tr>
<tr>
<td>1990</td>
<td>670,424</td>
<td>49,937</td>
<td>7.45</td>
<td>16.95</td>
</tr>
<tr>
<td>1995</td>
<td>935,321</td>
<td>60,756</td>
<td>6.50</td>
<td>17.80</td>
</tr>
</tbody>
</table>

Source: Compiled from Accra Planning and Development Program, 1991.

Table 6.20

Total and Informal Employment in Accra Metropolitan Area, 1984

<table>
<thead>
<tr>
<th>Sector</th>
<th>Total</th>
<th>Informal sector</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>61,700</td>
<td>41,470</td>
<td>68</td>
</tr>
<tr>
<td>Mining/Quarrying</td>
<td>1,487</td>
<td>552</td>
<td>37</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>103,570</td>
<td>65,097</td>
<td>63</td>
</tr>
<tr>
<td>Construction</td>
<td>20,109</td>
<td>5,373</td>
<td>27</td>
</tr>
<tr>
<td>Utility</td>
<td>10,384</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Wholesale/Retail</td>
<td>171,202</td>
<td>149,125</td>
<td>87</td>
</tr>
<tr>
<td>Transport/Comm.</td>
<td>36,732</td>
<td>10,930</td>
<td>30</td>
</tr>
<tr>
<td>Finance/Banking</td>
<td>15,291</td>
<td>738</td>
<td>5</td>
</tr>
<tr>
<td>Social Services</td>
<td>121,605</td>
<td>26,701</td>
<td>22</td>
</tr>
</tbody>
</table>

Source: Accra Planning and Development Programme, 1991

9 The City of Accra excludes other towns which are under the jurisdiction of AMA such as Labadi, Teshie and Nungua.
In Accra, urban agriculture has become a refuge for re-deployees from the public sector. Eight of the urban gardeners interviewed had been laid off from the Ministry of Agriculture due to the implementation of SAP's redundancy-reduction policy. Their decision to engage in urban farming was influenced by the skills and knowledge they acquired working with the agricultural ministry. In an interview with Ms Andah, the Greater Accra Extension Officer, she indicated that about one-quarter of the unskilled workers of the ministry who were retrenched or laid-off from their work have taken to the cultivation of exotic crops in the city. The ministry has, in turn, provided incentives in the form of credit facilities, improved seedlings and extension services to these former employees (new farmers).

To assess the relative importance of the inner city and the outer city in terms of their share of the urban gardeners, agricultural populations in various localities in the AMA were compiled from the 1970 and the 1984 population census reports (Table 6.21). While, in absolute terms, the data show phenomenal increases in the number of people engaged in agriculture between 1970 and 1984, irrespective of zone, the relative or percentage distribution of the data show spatial variations, which indicate a significant decrease in the inner zone and a general increase in the outer zones.

In Laterbiokorshie and Abose-Okai, in the inner zone, for instance, the relative proportion of the agricultural population decreased from 24% to 20% and from 32% to 12% respectively. In Madina, in the outer zone, the proportion rather increased slightly from 3% to 5%. With the exception of Ashalebotwe where the proportion of agricultural population decreased from 62% to 48%, all other localities in the outer zone experienced spectacular increases. The mean proportion of urban gardeners in the outer zone rose from 38% in 1970 to 55% in 1984. In Kwabenya, for example, it rose from 22% to 79% while in Ayimensah the corresponding proportions were 40% and
Female gardeners who were employed with the MOFA but were laid-off due to the implementation of the SAP's redundancy policy.

On-the-farm purchase of vegetable crops by a market woman who will retail them at the local market.
68% respectively. Thus, the highest increases in the proportion of agricultural population were recorded in the outer zone, making this zone the most important in terms of overall agricultural employment. This conclusion confirms not only the dominant role of agriculture in the outer city zone currently, but also the increasing importance of agriculture as a major informal sector employment.

<table>
<thead>
<tr>
<th>Zone</th>
<th>Settlement</th>
<th>1970 Total employed</th>
<th>No. in agric.</th>
<th>% in agric.</th>
<th>1984 Total employed</th>
<th>No. in agric.</th>
<th>% in agric.</th>
</tr>
</thead>
<tbody>
<tr>
<td>INNER</td>
<td>Lartebiokorshie</td>
<td>164</td>
<td>39</td>
<td>23.8</td>
<td>547</td>
<td>107</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Abose Okai</td>
<td>95</td>
<td>30</td>
<td>31.6</td>
<td>251</td>
<td>30</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Kaneshie</td>
<td>105</td>
<td>15</td>
<td>14.3</td>
<td>227</td>
<td>24</td>
<td>11</td>
</tr>
<tr>
<td>OUTER</td>
<td>Madina</td>
<td>2,684</td>
<td>85</td>
<td>3.2</td>
<td>11,792</td>
<td>631</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Shiashie</td>
<td>446</td>
<td>61</td>
<td>13.6</td>
<td>821</td>
<td>140</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Kwabeng</td>
<td>216</td>
<td>47</td>
<td>21.8</td>
<td>270</td>
<td>214</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>Ashalebotwe</td>
<td>154</td>
<td>96</td>
<td>62.3</td>
<td>436</td>
<td>207</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Abokobi</td>
<td>149</td>
<td>43</td>
<td>28.9</td>
<td>320</td>
<td>112</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Pantang</td>
<td>139</td>
<td>62</td>
<td>44.6</td>
<td>331</td>
<td>187</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>Oyarefa</td>
<td>343</td>
<td>134</td>
<td>39.1</td>
<td>519</td>
<td>255</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Kweiman</td>
<td>216</td>
<td>69</td>
<td>31.9</td>
<td>281</td>
<td>136</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Ayimensah</td>
<td>97</td>
<td>96</td>
<td>40.2</td>
<td>206</td>
<td>140</td>
<td>68</td>
</tr>
</tbody>
</table>

Source: Compiled from 1970 and 1984 Census Reports (Economic Characteristics) of Ghana.

The labor-intensive nature of urban agriculture in Accra provides a strong indication of the potential employment growth of the sector in future. Also, the fact urban cultivation is an easy industry to enter (as it requires inexpensive inputs and limited technical knowledge), provides tremendous employment opportunity for the urban poor.
Besides being an important source of employment, urban agriculture in Accra creates jobs in other sectors of the economy through its forward and backward linkages with these sectors (Fig 6.6). For instance, vegetables produced from commercial farms are supplied as raw material to the agro-industries and the vegetable oil processing companies located in Accra, Tema and Nsawam such as the Nsawam GIHOC Cannery, Ghanacan, GAFCO and the State Fishing Corporation. Additionally, large-scale commercial farmers rely on commercial storage facilities for the preservation and refrigeration of their produce. Urban gardeners also purchase seeds from the Ghana Seed Company stalls located in various parts of Accra. Almost all the gardeners located along the Odaw River patronize the Seed Company stall at the Neoplan Stations, which is about 200 meters away. Cultivation furthermore provides links with the other informal sectors such as the purchase of organic manure from the poultry farms, and farm implements from hawkers, blacksmiths or the market centers of Kantamanso and Tudu. Vegetable cultivation is linked with the urban market through individuals, market women and institutional customers. Market women buy vegetables in bulk from the gardeners for resale at the Accra central market (31st December Market) or to the wayside food sellers. They mostly pre-finance the gardeners by paying for the crops in advance and providing bulk and ready purchase for the crops.

There are institutional customers such as Flair Catering House who rely on exotic vegetables produced from the urban gardens to prepare their restaurant menu. Contracts are also awarded to some commercial farmers by big commercial houses like United Trading Company (UTC), Ghana National Trading Corporation (GNTC), Kingsway, Glamour and the Chandirams, for the supply of vegetables to be retailed through their department stores. Furthermore, exotic vegetables are supplied to some supermarkets located in high-income neighborhoods to be sold to the residents.
Fig. 6.6 Linkages Associated With Urban Gardening in Accra

- **Commercial House**: Contract supply of vegetables from gardens to UTC, GNTC, Chandirams and supermarkets.
- **Market women**: Direct bulk purchase from gardeners. Pre-finance of gardening operations.
- **Artisans**: Acquisition of farm tools from hawkers and blacksmiths.
- **Agro-Industries**: Supply of vegetables to agro-industries for processing and canning.
- **Poultry Farms**: Purchase of organic manure from poultry houses and supply of poultry feeds.
- **Food vendors**: Supply of fresh vegetables to way-side food sellers.
- **Ministry of Agriculture**: Extension services to urban gardeners.
- **Ghana Seeds Company**: Acquisition of seeds from stalls of Ghana Seeds Company.
- **Institutional customers**: Supply of fresh vegetables to catering houses and restaurants to prepare menu.
- **Urban market**: Acquisition of seeds, and tools from the market. Supply of vegetables to the market.
- **Storage facilities**: Commercial storage and preservations provided by refrigeration centers.
Another link is provided by wayside food sellers who buy vegetables from the gardeners to serve their customers. These are mostly women who sell rice and beans, banku, plain rice and jollof rice by the roadside in the city. Customers usually go to buy these food items and then ask for lettuce, cabbage, fresh tomatoes, onions, and carrots which are chopped into pieces and sold alongside the food. Also, there are individual customers who are predominately Europeans, American and Oriental people and affluent Ghanaians whose diets consist mainly of vegetables. The informal transportation, “tro-tro”, are the most important source of transporting farm produce from the outer city to the markets in the CBD. Limited extension service is also offered by the Ministry of Agriculture to commercial cultivators of exotic vegetables.

6.2. Contribution to Urban Ecology

Besides providing and enhancing the economic livelihood of the households of urban gardeners, urban agriculture contributes to the protection and management of the urban ecology of metropolitan Accra. The activity has the potential for enhancing the integrity of the urban ecosystems by recycling organic waste, abating floods and reducing energy demand in the metropolis. Thus, urban cultivation has the potential for achieving the goals of a green, liveable city which emphasizes the symbiotic relationship between the built environment and human well-being.
6.2.1 Waste Management

In Accra, current waste management practices can be described as inefficient and ineffective as they limit residents access to waste collection and disposal facilities. The Waste Management Department (WMD) of the AMA is faced with the problem of lack of finance\(^\text{10}\) and this has restricted the WMD from providing efficient and effective services. The financial predicament facing the WMD has led to a low acquisition of capital equipment, low level of services and breakdown of vehicles, plants and equipment (Benneh, 1993). Consequently, only 11% of the Accra's population benefits from house-to-house waste collection, while most rely on open dumping or communal disposal sites (Amuzu and Leitman, 1994). The bulk of the domestic waste finds its way to unauthorized disposal sites, where it is mostly abandoned. The environmental threat posed by solid waste in the AMA can be seen in the amount of waste generated per day in Accra as shown below (Table 6.22). Environmental problems associated with the current inappropriate waste disposal practice include air and odor pollution, disease vectors stemming from uncollected refuse, and the blockage of drains resulting from illegal dumping.

\(^{10}\) In the early of 1990s, the W.M.D. spent 66 million cedis a month on its operations, however its sources of revenue from house to house collection fees (8 million cedis a month), cesspit emptying service fee (9 million cedis a month), pan latrine (6 million cedis a month), and the sale of compost (300,000 cedis a month) fall short of the yearly budgetary expenditure (Chief Mechanical Engineer, Waste Management Department).
Table 6.22
Solid Waste Generation in Accra

<table>
<thead>
<tr>
<th>Year</th>
<th>per capita per day</th>
<th>tons per day</th>
<th>tons per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>0.51</td>
<td>670</td>
<td>245,363</td>
</tr>
<tr>
<td>1993</td>
<td>0.52</td>
<td>709</td>
<td>258,721</td>
</tr>
<tr>
<td>1994</td>
<td>0.53</td>
<td>749</td>
<td>273,454</td>
</tr>
<tr>
<td>1995</td>
<td>0.54</td>
<td>792</td>
<td>288,922</td>
</tr>
<tr>
<td>1996</td>
<td>0.55</td>
<td>837</td>
<td>306,291</td>
</tr>
</tbody>
</table>

Source: Waste Management Department Report, 1993

In Accra, some urban cultivation practices have the potential to contribute to the management of urban wastes in the metropolis as they transform the unidirectional flow of waste from the urban gardens to garbage into a circular flow of waste recycling. About 73% of the gardeners indicated that they use organic manure, such as poultry droppings, cow dung, kitchen wastes, and compost to improve the fertility of their farm land. The author observed how these gardeners close the production-consumption-disposal loop by recycling these different forms of organic wastes in their gardening operations.

First, when garden beds are raised earlier for planting, most gardeners covered these beds with ground wastes such as cut grasses and fallen leaves and palm frongs to reduce evaporation and retain water in the soil. When these leaves dried and decomposed they fertilize the soil before planting. Secondly, a week prior to
transplanting, animal wastes in the form of sheep, goats and fowl droppings\textsuperscript{11} are spread on the garden beds and later mixed with the soil as organic manure.

Next, most backyard gardeners and some vegetable growers used kitchen waste to cultivate their crops. The kitchen waste is accumulated in heaps in their backyards and dug-in or simply spread-out as well-rotted compost or sometimes as fresh material. Fourthly, mixed farming, which involves the rearing of animals and cultivation of crops provides a very good opportunity for some gardeners to practice organic recycling. These gardeners keep livestock and poultry on their household compounds and this provides a routine cycle by which feedstuffs are fed to the livestock and poultry and their droppings used as manure on the gardens.

Some gardeners are involved in what can be described as “green manuring” where they consciously fertilize their gardens with wastes from legumes such as beans and cow peas to enrich the soil with fixed nitrogen. Finally, garbage farming is practiced by few gardeners who have converted the old garbage dump sites, which lie adjacent to the buildings of the West Africa Examination Council (WAEC), into garden plots. The garbage, which is several years old, has well decomposed and has even attracted the attention of nearby gardeners who collect and apply it on their gardens. Thus it can be seen that gardeners in Accra practice a number of waste recycling initiatives which lend credence to the view that biological recycling offers another alternative to managing wastes in the metropolis.

Ever since the early 1970s, metropolitan planners have been nursing the hope that composting could become a viable alternative to the conventional waste disposal system and reduce the cost of waste management in Accra. This hope was translated

\textsuperscript{11} In contrast with Asian cities, night soil is not used in Accra because of cultural restrictions.
into action when in 1979 the Teshie Compost plant\textsuperscript{12} was built to recycle the organic fraction of domestic waste generated in the metropolis into compost for agricultural uses.

Containers are placed at various central locations and transferred periodically to the Teshie Compost plant where the non-biodegradables are removed and the organic component composted. When operating at full capacity, the plant is designed to produce 200 tons of compost a day. Out of approximately 11,000 tons of annual waste input, some 5,000 tons of compost are produced by the plant. It should be noted that it is cultivation in Accra that supports the viability of this compost plant, as it provides a regular demand to the plant's by-product (Government of Ghana, 1989).

There are a number of conditions that promote the potential for organic recycling as a viable waste management technique in Accra. These include: 1), Accra has a year-round warm, humid climate which favors the operation of composting; 2), household waste in the AMA constitutes the largest share of the metropolitan wastes; hence, backyard composting could easily be promoted and sustained; 3), the municipal solid waste in the metropolis has an organic fraction of about 70-80\% and a moisture content of about 50-60\%, two conditions favorable to composting; 4), there is already a relatively low-wage labor pool in the metropolis that can be used to collect and transport the waste and to sort the undesirable materials from the organic fraction; 5),

\textsuperscript{12} The plant was built by Buhler Brothers, a Swiss company, at a cost of 2.5 million U.S. dollars.
Plate 6-3  Mixed poultry droppings about to be used to manure vegetable beds.

Plate 6-4  Organic mulching of pre-cultivated vegetable beds.
there is already an existing informal waste recycling system which removes from the metropolitan waste stream much of the valuable non-compostable material (glass, plastic, metal, rubber, and paper) leaving the organic component for composting; 6), there is a very promising market for organic manure in the metropolis and this includes the growing number of urban gardeners, several parks and landscaping contractors who rely on compost from dumpsites to grow aesthetic plants, and the growing demand for compost by the Department of Parks and Gardens, the Irrigation Department, and the City Engineers Department from the Teshie composting plants; 7), the rising price of petroleum products including chemical fertilizers which limits the ability of gardeners to rely on chemical fertilizers for all year-round cultivation\textsuperscript{13}; 8), often organic wastes are free of charge as poultry owners, herders or goat-rearers are happy if the extra work of disposing of these wastes is handled by the urban farmers; and 9), compost contributes to soil enrichment as its application results in a stabilization of soil structure and aeration, less erosion and run-off, a higher water retention capacity and increased buffer capacity which prevents cations from leaching.

Asomani-Boateng (1993) undertook a pilot project in Accra to explore the use of composting and the extent to which the people of Accra embrace the idea of composting. In the project, of the 792.9 kg of garbage generated by the sampled households, 490.5 (62\%) was diverted and recycled into compost. According to Asomani-Boateng, the project attracted a lot of attention from the participants and changed their negative perception about waste. Community leaders of nearby neighborhoods like Korle Wokon, Sabon Zongo, Salaha and James Town, who were invited to observe the composting process, later implemented their own pilot projects.

\textsuperscript{13} Based on the field interview, I was informed that for a gardener to fertilize a garden bed of six meters long, he/she needs 2,500 cedis worth of Ammonia and 2,200 cedis worth of Femasen and 3,000 cedis worth of NPK. However, it will cost him/her only 2,500 cedis to use organic manure.
He indicated that the participants became receptive to the use of composting after they gained valuable biological knowledge about the composting process and its potential role in the management of waste in the city. This indicates a great future and potential of the use of urban compost in Accra.

In a related pilot project, the Horticulture Center of Ouando, Benin, carried out experimental work to assess the potential of municipal refuse as an organic fertilizer for the production of amaranth, carrot and lettuce in Porto Novo and Cotonou (Grubben, 1982). The refuse was sorted into organic and inorganic materials, with the organic material used for the experiment. The organic content is often high as most of the refuse comes from the food market and animal farms. In the experiment, vegetable growers buried high doses of refuse (25-100 kg per bed) and were able to cultivate three to four successive crops of amaranth before renewing the fertilization. The experiment showed that fresh or partly decayed municipal refuse is good organic manure (Table 6.23), and that fresh refuse has the same or a slightly better effect on the vegetable yield than compost refuse.

Based on the results of the experiment, it was recommended that vegetable growers should apply at least 25 kg of town refuse per 10m² bed of a vegetable crop on a fertile soil and 50 kg per 10m² on a poor soil. In comparing refuse with organic composting, Grubben indicated that refuse is less expensive than compost because of high labor hours associated with composting (about 5 working days per ton) which makes compost at least three times more expensive than town refuse. Another disadvantage associated with composting is the considerable loss of minerals at 39% of nitrogen, 42% of calcium, and 20% of potassium. A similar experiment by the Royal Tropical Institute revealed that composting, after two turnings in 7 months, had a good structure and composition, but was slightly inferior to fresh refuse (refer to Table 6.23).
According to Grubben (1982):

"... as a final conclusion we may state that, at any rate in present conditions, growers in Benin are quite right in manuring with good fresh refuse instead of making compost. Probably the hygiene aspect will lead to compost making in most cases. On the other hand, there is no proof that putting fresh refuse into the soil leads to greater health risks than putting it into heaps for composting.

However, one has to take caution not to over sell the potential of refuse without considering the possibility of food contamination given the fact the waste composition in Accra is likely to change in view of the on-going industrialization process taking place in the metropolis.

Table 6.23

Compost and Refuse: Macro-Nutrient Comparison

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Compost (kg/50t)</th>
<th>Refuse (kg/50t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>389</td>
<td>413</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>81</td>
<td>119</td>
</tr>
<tr>
<td>Potassium</td>
<td>175</td>
<td>238</td>
</tr>
<tr>
<td>Calcium</td>
<td>739</td>
<td>1,610</td>
</tr>
<tr>
<td>Magnesium</td>
<td>70</td>
<td>140</td>
</tr>
<tr>
<td>Sodium</td>
<td>46</td>
<td>98</td>
</tr>
</tbody>
</table>

Source: Division of Soils and Agro-chemistry, Royal Tropical Institute (Grubben, 1982).

6.2.2 Other Environmental Benefits

Accra is occasionally inundated by rather short duration floods which occur in the May-July wet season, and this has presented a challenge to urban management in the metropolis. However, urban farming possesses the potential for reducing the effects of urban flooding in Accra as some of its practices can abate, manage or control mild floods. For instance, some urban gardeners in Accra create flood retention basins to
collect water during heavy rainfall to irrigate their gardens. Such basins have the advantage of creating silt traps which help reduce the rate of down stream siltation and flooding. Flood water is also retained in a channel dug around the raised beds which is used to irrigate the crops daily, wash harvested vegetables, and clean gardening tools. Thus, when mild flooding occurs water is made available to the gardeners from the dug channel and the crops are protected from inundation as the garden beds are raised above the water level in the channel. Areas along streams and water courses which are susceptible to occasional mild flooding have attracted a number of gardening activities as some gardeners benefit from the presence of flood water and well-moistened soils to cultivate these strips of land. Thus, the potential of urban agriculture as an abatement measure for mild floods should motivate metropolitan planners to acquire undeveloped areas of potential mild flooding for urban gardening and location of public parks.

Furthermore, urban agriculture offers an alternative means of reducing energy demand and air pollution, as well as promoting energy conservation. Table 6.24 provides a matrix which establishes the link between urban agriculture, energy conservation and emission control. Urban agriculture has the potential for conserving the resources of the surrounding bio-regions by reducing urban demand for food and fuel from the outlying rural areas. Combined with community forestry or wood lot plantation, urban agriculture has the potential to reduce urban demand for fuel wood from rural regions thereby preserving the carbon sink potential of the rural regions while, slightly, enhancing the carbon sink potential of the urban region.
Plate 6-5  A water channel created in between raised beds to control mild floods and to collect water for crop irrigation.

Plate 6-6  The use of a tube, connected to household pipe, to irrigate vegetable crops.
Plate 6.7  A mild flood in the outer city, a potential gardening site.

Plate 6.8  A site of occasional mild flooding under vegetable cultivation.
Growing food in Accra has the potential of reducing transportation fuel use and vehicular emissions associated with food transportation as it reduces the distance of transporting food from the rural areas to the city’s central market. Among the benefits associated with urban agriculture has been the improvement in the mental and physical health of the urban residents. This is demonstrated by a study conducted by the U.S. Department of Agriculture in 1972 which reveals that trees, plants and flowers satisfy some of the psychological needs of humans, provide excellent forms of relaxation, and

<table>
<thead>
<tr>
<th>Table 6.24 URBAN AGRICULTURE AS AN URBAN SUSTAINABILITY INITIATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Element</strong></td>
</tr>
<tr>
<td>--------------</td>
</tr>
<tr>
<td>Crop harvesting</td>
</tr>
<tr>
<td>Organic composting</td>
</tr>
<tr>
<td>Woody vegetative matter</td>
</tr>
<tr>
<td>Agricultural wastes</td>
</tr>
<tr>
<td>Urban location</td>
</tr>
</tbody>
</table>

offer the inner satisfaction and the feeling of self-control of having grown one's own food. Urban gardening provides aesthetic benefits to many gardeners who have been longing for green surroundings and for rural migrants who have been searching for a feel of rural life in an urban setting. About 7% of the gardeners interviewed indicated that urban cultivation is a hobby they have acquired and they enjoyed doing it for its...
aesthetic importance. During the survey, the author observed that community gardening in Kaneshie offers a great sense of integration and unity among the different sections of the community. It offers an opportunity for meeting and communicating with neighbors and feeling the sense of community belongingness. In some developed countries, horticulture therapy is used in hospitals and prisons (Eguillor, 1993). Urban agriculture is said to contribute to the treatment of some urban ills by means of outward physical improvement of the environment and the potential for a personal spiritual awakening. In the ecology of the human spirit, the environment of gardens could be of tremendous healing power.

It should however be noted that, although food cultivation in Accra possesses some environmental benefits, there are also some environmentally negative aspects of urban farming in Accra, especially intensive farming. These include the use of polluted water for irrigation, exposure of vegetable crops to automobile exhaust fumes, misuse of compost, and contamination of drinking water. These have raised some concerns by officials of the Accra Metropolitan Authority regarding the suitability of farming in Accra. The next chapter provides detail discussions on these concerns.
Chapter Seven

Constraints on Urban Agriculture in Accra

Although urban agriculture plays a significant role in the household economy of the people of Accra, the sector is undergoing stress that emanates from the urbanization process taking place in the metropolis. Intricate problems have emerged because the sector is not formally recognized and/or integrated into the metropolitan development plan. Additionally, a number of urban institutions and departments are skeptical about the practicality of farming within the metropolis, and have decided to limit the accessibility of urban gardeners to needed inputs and restrict the development of agriculture in the metropolis. This chapter explores and examines the various input constraints facing urban agriculture as well as institutional policies discouraging urban cultivation in Accra.

7.1 Input Constraints

Data collected from the gardeners and information derived from the staff of the extension services reveal that urban farming in Accra is confronted by a number of problems. These problems center on availability of, and/or accessibility to, production capital, irrigation facilities, improved seeds/seedlings, storage facilities, organic manure, chemical fertilizers, markets, farm implements, pesticides and insecticides. Given the gardeners' limited resources, it is essential and prudent that these problems be prioritized so that scarce resources are effectively utilized to solve the most pressing problems.

Poor access to urban land for farming was mentioned by 25% of urban gardeners as their most pressing problem. This is followed, in descending order, by lack of finance (23.3%), high cost of agro-chemicals (16.7%), theft and vandalism (15%), lack of improved seeds or...
seedlings (6.7%), lack of water for irrigation, (6.7%), limited markets (5%) and poor access to urban compost (1.7%). The problem of land accessibility in Accra was addressed in chapter four; hence, this issue will not be covered here.

7.1.1 Finance

Urban gardeners do not require a huge amount of capital to finance their farming activities; however, they are confronted with the problem of lack of capital to adequately finance these activities. Most gardeners do not qualify for bank or institutional credits because they can not provide the required collateral security. Furthermore, because their activity is characterized by lack of official recognition, tenure insecurity, lack of organized market and informality, most financial institutions do not extend loan services to urban gardeners. Their main source of finance is their personal savings. This source is inadequate to finance the purchase of inputs such as improved seedlings, hybrid seeds, organic manure, plastic tubes and insecticides. Thus, lack of production capital limits gardeners’ ability to employ intensive methods of production, upgrade their farming technology, and engage in year-round cultivation. However, some gardeners rely on loans from money-lenders and traders to finance their activities. Some gardeners are compelled to acquire loans from traders who buy their garden produce even though this arrangement leads to a problem of forced selling, where a trader offers a loan to a gardener on the condition that the trader determines the price and quantity of the crop to be purchased. A few of the surveyed gardeners stated that they were not interested in a bank loan because they believed that they would not be able to sell their produce and realize enough profit to pay back the loan, thus running into debt.

About 32% of the low-income gardeners indicated that, among other problems, lack of finance was their most pressing problem; or stated differently, of all the urban gardeners who indicated that lack of capital was their first problem, a vast majority of 79% were low-income
Fig. 7.1 Input Constraints To Urban Gardening Reported By Gardeners (First Priority)

Source: Author’s Field Survey, 1996
gardeners. Low-income gardeners clearly lack the needed capital to finance their farm operations and they are less qualified to secure institutional credits. On the basis of gender, there were more male gardeners (64.3%) than female gardeners (35.7%) who indicated the problem of lack of capital as their most pressing problem. This may be because more men than women are involved in intensive commercial cultivation of exotic crops, a production method which requires a significant financial investment. Also, tenant gardeners (50%) are the dominant land tenure group that indicated inadequate finance as their most pressing problems. This may also be due to tenant gardeners heavy involvement in intensive commercial cultivation to pay for the cost of the land.

7.1.2 *Agro-chemicals*

According to the front-line staff (extension services), nearly all the vegetable crops grown in Accra are plagued with diseases and pests. The cultivation of cabbage and cauliflower is practically impossible without insecticides because of frequent pests attacks. Tomatoes, okro and peppers are susceptible to the attacks by nematodes and fungi. In the dry season, grasshoppers attack cassava and damage their leaves. Weevils attack maize while cabbages are attacked and destroyed by caterpillars, mealy bugs and grasshoppers. Cucumber is often attacked by beetle while radish is prone to the attacks by white rust diseases, black rot and leaf spots. Onions and watermelons are ravaged by mildrew and lettuce is often attacked by cutworms and eelworms. Crickets very often destroy newly transplanted seedlings by cutting the stems at soil level.
To overcome these insect and pest attacks, various insecticides are used by gardeners\(^1\). The extension service supplies gardeners, at a cost, with fertilizers (NPK and sulphate of ammonia) to enhance the availability of plant nutrients in soil; insecticides (Roxion, Cymbush, Ripcord, Perfekthion) to control insects on the gardens; fungicides (Kocide 101) and herbicides (Gramoxon, Primagram, Atrazine, Bellater, Primextra) to control weeds; and preservatives (Actellic) to store grains after harvest. Supplies from the Extension Services are relatively cheaper but irregular as agro-chemicals from government source are often short in supply. Gardeners are therefore compelled to rely on market supply. However, 17% of the gardeners indicated that they hardly used these chemicals because they are expensive on the market, hence unaffordable. A market survey of the prices of some of these insecticides revealed that Dithane M-45 is 4,000 cedis for a 540 gram tin, Basudin fetches 12,300 cedis with Grammoxone costing 7,600 cedis per litre. The high cost of these agro-chemicals has compelled some gardeners to use traditional methods such as applying ashes, either pure or in solution, to dust vegetable leaves 3 to 4 times a week to kill insects; cutting off leaves affected by disease such as white rust, powdery mildrew, black rots and leaf spot; or adopting crop rotation practices to avoid the build-up of nematodes and other pests. Other gardeners also rely on cheap but ineffective or health-risk agro-chemicals such as sulphur dust, Dithane M-45, Aldrex-40 and DDT (in solution) to treat radish, cabbage, cucumber, watermelon, onions and carrots.

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\(^1\) None of the gardeners indicated the use of biological control. The metropolitan authority will be very much concerned about the release of predatory insects.
Plate 7-1  Vegetable crops infected by diseases

Plate 7-2  A broken-down farm tractor equipment.
7.1.3 Theft

Fifteen percent of the urban gardeners indicated that garden theft is the most important problem facing them. Gardeners whose garden plots are located far from their place of residence are more prone to theft as they are unable to provide regular farm supervision. For instance, gardeners who reside in the inner city but cultivate in the outer city frequent their gardens only on weekends; hence, they are more likely to experience garden theft. In contrast, backyard gardeners are less vulnerable to theft as the location of the gardens close to their place of residence allows for regular supervision by the household members.

Another group of gardeners more prone to theft are squatter gardeners, who have little or no recourse to police protection because of their illegal use of the land. Although there is a high tendency for exotic vegetable growers to experience garden theft because of the high market value of their produce, this tendency is reduced as they tend to invest in farm security either in the form of hiring a “watchman”, erecting wooden fences, or growing hedges around the gardens. Thus, because of the high capital intensity of their cultivation, it is worthwhile for exotic vegetable growers to invest in farm security. Other gardeners display “juju” (black magic) on their gardens to warn any potential thieves of the consequences of their action which, superstitiously, is believed to be an accidental death or a severe, long-term illness.

There was no noticeable difference in the number of male and female gardeners who indicated the problem of theft as their most priority concern, although there is the tendency for male gardeners to experience more theft due to their concentration in the outer city. Similarly, low-income gardeners are more vulnerable to garden theft as they have few resources to procure a security service or adopt security measures.
7.1.4 Seeds/seedlings

A number of gardeners (7%) identified poor access to improved seeds or seedlings as their most important problem. The problem of access to seeds or seedlings results from lack of availability, high market price or low quality. Some gardeners indicated that, occasionally, there are shortages of lettuce and cabbage seeds on the open market but they are available on the black-market at a very high price. Even, on the open market, some gardeners complained that the prices of some seeds are exorbitant. Table 7.1 provides prices of some vegetable seeds sampled on the open market in June 1996.

Table 7.1

<table>
<thead>
<tr>
<th>Seeds</th>
<th>Cost/kg</th>
<th>Cost/small packets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cabbage</td>
<td>28,000</td>
<td>1,400</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>3,000</td>
<td>-</td>
</tr>
<tr>
<td>Lettuce</td>
<td>12,000</td>
<td>1,800</td>
</tr>
<tr>
<td>Onion</td>
<td>56,000</td>
<td>1,800</td>
</tr>
<tr>
<td>Sweet paper</td>
<td>58,000</td>
<td>1,750</td>
</tr>
<tr>
<td>Radish</td>
<td>28,000</td>
<td>2,400</td>
</tr>
<tr>
<td>Cucumber</td>
<td>48,000</td>
<td>1,400</td>
</tr>
<tr>
<td>Watermelon</td>
<td>34,000</td>
<td>2,000</td>
</tr>
</tbody>
</table>

Source: Author’s Market Survey, Accra; June 1996.

Other gardeners indicated that often improved seeds are not available on the open market during the planting period when they are most needed. Even when they are available their quality is questionable, as according to these gardeners, the Ghana Seed Company often
sells to them old stocks of seeds which have a prolonged germination period or a high rate of germination failures.

7.1.5 Irrigation

Only a few gardeners (7%) identified poor access to irrigation water as their greatest constraint. These are mostly gardeners who rely on pipe-borne water to irrigate their crops. In Accra, the supply of water is erratic, especially for the low pressure zone in the western parts of the city. The worst affected areas are Dansoman, South Odorkor, Bubuashie and Darkoman. The frequent interruptions of water supply and the rising cost of pipe-borne water limit the ability of vegetable growers in the above-mentioned areas to rely on the use of pipe-borne water to irrigate their crops.

Furthermore, since the inception and the implementation of the Structural Adjustment Program, the prevailing ethos has been the removal of subsidies from all services including water. The cost-recovery measures for water use have meant regular revision of water tariffs upwards. In 1995, the water rate for metered premises is 741.00 cedis for the first 3,000 gallons per month and 814.00 cedis per thousand gallons consumed in excess of 10,000 gallons per month. Unmetered premises are charged a flat rate of 741.00 cedis per house per month. Those who rely on public stand pipes are charged a flat rate of 247.00 cedis per month per house. For residents who rely on boreholes, wells and hand pumps, a flat rate monthly charge of 146.00 cedis is levied per house. The cost of purchasing water from vendors is approximately 10% of the monthly income of low income households (Benneh, 1994), which certainly constrained the ability of gardeners to acquire water to irrigate vegetable crops.

Backyard and tenant gardeners are most likely to be affected by the high cost of water and the irregularity of pipe-borne water supply, as they are more dependent on this source of water. The availability of rainfall to irrigate crops was not a constraining factor as most outer
city gardeners, whose cultivation is mainly rainfall-dependent, are tuned to the pattern and rhythm of the rainfall season. With regard to stream water, the Odaw river, which is the main source of water supply for vegetable growers along the Ring Road North Industrial Area, the Police Training Depot and the Caprice Hotel, is the only source of water available all year round for vegetable cultivation. However, it should be noted that a few gardeners do rely on streams other than the Odaw river for a portion of the year.

7.1.6 Markets

Only three gardeners identified poor access to the urban market as their most pressing concern. These gardeners complained that they are often offered ridiculously low prices for their farm produce which do not even cover their cost of production. As part of the loan agreement\(^2\), gardeners are required to sell their produce to market women who buy them at a low price and resell them at a much higher price. For instance, a bunch of cabbage and lettuce which sell for 1,800 cedis and 2,300 cedis at the farm gate are respectively sold for 3,500 cedis and 4,300 cedis by the market women at the market.

Another marketing problem confronting the gardeners is the competition from farmers cultivating exotic crops in the outlying rural areas, especially the neighboring towns of Nsawam and Swedru. The quality of the farm produce from these rural areas is better and their sizes bigger than those obtained in Accra. This may be due to the exhaustion of soils in Accra resulting from intensive use of the land. Also, the continuous demolition of vegetable selling points (kiosks) by the Accra Sanitation Task Force - with the intention of beautifying the city - has forced some vegetable sellers to relocate their sale outlets to obscure places mostly unknown to customers.

\(^2\) As already discussed, some market women provide financial assistance to gardeners in a form of loan to enable them cultivate exotic crops.
Male gardeners have the tendency to identify the problem of marketing as their most pressing concern. This is because female gardeners are more integrated into the urban marketing system as they are directly involved in retailing their own produce on the central market. Male gardeners, on the other hand, often rely on intermediaries who sometimes are irregular in their purchase or provide poor marketing deals. Also, low-income gardeners are more likely to be confronted with the problem of marketing as they have weak bargaining power and limited options for selling their produce. In addition, in an attempt to secure loans to supplement their low production capital, more low-income gardeners are more likely to contract the sale of their garden produce to the market women, a sale method which is unfavorable to the gardeners. Being strong market-oriented producers, utility gardeners and tenant gardeners are more prone to the effects of market operations and distortions associated with the sale of their garden produce. Finally, because they are often constrained by distance to the urban market and cost of transportation, exotic cultivators in the outer city are more likely to experience marketing problems than their inner city counterparts.

7.1.7 Organic manure

High transportation cost has impeded the ability of one gardener to use organic manure on his farm. Although urban compost and animal manure are, in most situations, free of charge, their bulky nature makes it is very expensive to be transported. This gardener claims that to incur such transportation cost, the economic viability of his production will be seriously undermined. Grubben (1982) expressed a similar view when he indicated that, as a rule, the use of organic manure is not economical to a grower at a distance of more than 20-25 km from the garbage collecting points.
7.1.8 Storage

While a refrigerator is the most popular storage facility among high-income gardeners, most low-income gardeners have no access to such a facility. The survey reveals that storage facilities for vegetable crops, in the form of deep freezers, were lacking for low-income gardeners. This is adversely affecting vegetable production in the sense that vegetables such as cabbage, lettuce, green pepper and cucumber, which quickly get spoiled, cannot be stored in their original state for more than two or three days. They quickly lose their color, taste and nutritional value which adversely affect the demand and price offered for them. Even, the expansion of commercial production of vegetable crops for export by high-income gardeners is greatly hampered by lack of adequate commercial cold storage and warehousing facilities in Accra. This is a great concern of the gardeners as most of their customers refuse to buy two or three days old vegetables; they prefer the fresh ones. However, some gardeners have adopted traditional preservative measures such as not harvesting vegetable crops until there are ready market for them or selling vegetables together with their roots so that by immersing the roots in water, the freshness of the vegetable is prolonged.

7.2 INSTITUTIONAL CONSTRAINTS

A legacy of colonialism in Ghana has left urban planners and policy makers with the conviction that the city should be a place of modernity, commercialization and industrialization, and that agriculture, a rural characteristic, should not be a part of the urban setting. Consequently, in Accra, the use of urban land for agriculture is interpreted by most urban institutions as an invasion of rural habit on urban character. The institutional bias against urban agriculture in Accra has led to policy outcomes which impede the growth and development of the sector.
One such policy outcome is the failure of urban institutions to officially recognize urban agriculture as a land use activity and to integrate the sector in their policy and planning decisions. In Accra, official policy has been unsupportive of urban cultivation, sometimes deters or limits the growth of the sector. Some gardeners are often harassed by the Sanitation Task Force, evicted, threatened with eviction or have their crops physically destroyed.

Table 7.2

<table>
<thead>
<tr>
<th>Location</th>
<th>Discouraging</th>
<th>Encouraging</th>
<th>Not sure</th>
<th>Total</th>
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<tr>
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<td>17</td>
<td>11</td>
<td>2</td>
<td>30</td>
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<tr>
<td></td>
<td>57%</td>
<td>37%</td>
<td>7%</td>
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</tr>
<tr>
<td>Inner city</td>
<td>13</td>
<td>12</td>
<td>5</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>57%</td>
<td>40%</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>23</td>
<td>7</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>50%</td>
<td>38%</td>
<td>12%</td>
<td></td>
</tr>
</tbody>
</table>

First row = actual number
Second row = row percentage

Source: Author’s Field Survey, 1996

The survey asked gardeners to describe official policy towards farming in Accra. Their responses indicate that about one-third of them perceived policy towards urban cultivation as encouraging\(^3\) while half of them perceived official policy towards cultivation in Accra as discouraging. As shown in Table 7.2, there is the tendency for more gardeners in the outer city to perceive official policy as unfavorable. This may be because the outer city is characterized by unplanned settlements and illegal cultivation (squatter gardening) and these

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\(^3\) These are mostly utility gardeners who are in contractual agreement with the AMA to use public land for gardening or gardeners who have regular access to the services of the Extension Services.
are often the targets of harassment, evictions and encroachment by the metropolitan authority, public institutions or private individuals.

This pattern is clearly evident when these responses were cross referenced with the type of land tenure practiced by the urban gardeners. That is, 40% of squatter gardeners described the official response to urban cultivation in Accra as "highly discouraging"; and this is followed in descending order by 25% of custodian gardeners, 23% of utility gardeners, 21% of tenant gardeners and 0% of land-owner gardeners. This trend, undoubtedly, indicates that gardeners who cultivate the less secure land are more likely to describe official policy towards urban cultivation as discouraging while those that cultivate the more secured land are likely to perceive it as encouraging. This conclusion is buttressed by a chi-square analysis which reveals that there is a strong statistical relationship (a chi-square value of 41.06) between the responses given by the gardeners and the type of land tenure they practiced.

The survey revealed that, only 28.6% of the high-income gardeners perceive metropolitan policy as discouraging while greater proportions of 52.6% and 53.0% of the middle-income and low-income, respectively, provided such response. This trend suggests that low-income gardeners are more likely to describe metropolitan policy towards urban cultivation as discouraging, as they tend to cultivate cost-free land (squatter land or custodian land) which are more susceptible to encroachment and official harassment. On the other hand, the high-income gardeners can afford to rent or own a land, a situation which makes land less susceptible to official harassment and intimidation. To complement the responses from the gardeners, selective interviews were granted by the front-line staff of the District Extension Services, a health official from the Public Health Department and the Public Relations Officer of the Accra Metropolitan Authority to inquire about the reasons why official policy towards

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3 These are mostly utility gardeners who are in contractual agreement with the AMA to use public land for gardening or gardeners who have regular access to the services of the Extension Services.
urban cultivation is described by the gardeners as non-supportive and discouraging. A discussion of rationale perceived by these officials is presented below.

### 7.2.1 Emission-Based Contamination

The cultivation of vegetable crops close to industrial sites in Accra has raised public health concern regarding food contamination. According to the Public Health Department (PHD), siting urban gardens close to noxious and hazardous industries poses a public health risk as gaseous wastes and wind-borne particulates from these industries will increase soil and plant toxicity levels and, consequently, contaminate the crops being produced. In a laboratory investigation, Garbah et al. (1979) monitored suspended particulates in selected industrial and residential sites in Accra for a period of 5 months. The results of his investigation showed that the dust levels in all these areas exceeded the maximum World Health Organization (WHO) permissible limit of 150 mg.m. The actual level he recorded ranged between 210 and 480 mg.m. Unfortunately, some of these sites are also areas of intensive urban cultivation. These areas include the lower Odaw-Korle Lagoon area, the south motorway industrial area, Willowbrook Assembly Plant area near Dzonwulu, and the Neoplan-Achimota Brewery area along the Accra-Nsawam road outlet.

In light of the growing vehicular traffic in the metropolis, the Public Health Department has also expressed its concern about potential lead contamination of food produced along major arterial routes. According to the department, soils and crops near major roadways are likely to suffer heavy metal pollution from airborne lead and cadmium from gasoline exhaust. These emissions when settled on leaves and fruits of nearby cultivated crops may cause metal poisoning and intestinal problems in humans. Crops susceptible to such contamination include soft fruit and broad-leaved vegetables such as lettuce, spinach, and cabbage. In a laboratory investigation conducted by Environmental Management Associates, on behalf of the
Government of Ghana, leaves from Neem trees (*Azadirachta indica*) from selected sites (road, industrial and residential areas) in Accra were analyzed for trace metal concentration. The result revealed that there were significant levels of lead concentration in the leaves (Table 7.3). The Kwame Nkrumah Circle, the heaviest vehicular traffic route in Accra, recorded the highest concentration of lead contamination. Iron concentration found in these leaves was attributed to the atmospheric contamination by dust from construction activities.

Table 7.3

<table>
<thead>
<tr>
<th>Location</th>
<th>Hg</th>
<th>Pb</th>
<th>Cd</th>
<th>Mu</th>
<th>Fe</th>
</tr>
</thead>
<tbody>
<tr>
<td>K. Nkrumah Circle</td>
<td>0.260</td>
<td>51</td>
<td>0.1</td>
<td>49</td>
<td>3524</td>
</tr>
<tr>
<td>Valco Dump Site</td>
<td>0.079</td>
<td>10</td>
<td>0.1</td>
<td>87</td>
<td>258</td>
</tr>
<tr>
<td>Airport Res. Area</td>
<td>0.120</td>
<td>13</td>
<td>0.1</td>
<td>38</td>
<td>135</td>
</tr>
</tbody>
</table>

Source: Government of Ghana, 1989

Another concern relates to the cultivation of crops under power transmission lines. There is the view that gardening beneath transmission lines poses significant health risk to urban gardeners themselves; hence, cultivation at these sites should be discouraged (DeMatteo, 1993). Two types of fields are associated with transmission of electricity; the electric field and the magnetic field. These fields have the power to induce minute electrical currents in human bodies, changing the normal functions of cells and tissues and the chemistry of the brain, suppressing the body's immune system, and stopping the production of melatonin, a natural cancer-killing hormone (DeMatteo, 1993).

The issue of health effects of electric or magnetic fields has been quite ambiguous. In 1992, Sweden acknowledged a connection between exposure to electromagnetic fields and cancer based on a number of studies conducted over a period of 15 years (DeMatteo, 1993). However, Gorman (1992) conducted a similar study on people living within 300 meters of a
high-tension power lines and found no evidence of an increase cancer threat for adults, although he detected a high risk of leukemia in children. Although there were other studies which proved the relationship between electromagnetic fields (EMF) and brain cancer, leukemia, breast cancer, and reproduction, a study by the U.S. Environmental Protection Agency indicated that there was no proof of a causal link between EMFs and cancer. In general, a definitive statement can not be made in regard to the relationship between EMFs and health defects (DeMatteo, 1993).

7.2.2 Water-Based Contamination

The officials of the AMA and PHD were also concerned about the use of drain water by some gardeners in Accra to irrigate their crops. They were of the view that drain water in Accra is highly contaminated, and if used to irrigate crops, could pose a public health risk to the people of Accra. They explained that the lack of communal toilet facilities has led to open defecation along water drains in low-income neighborhoods and the disposal of effluent from kitchens, bathrooms and laundries into roadside ditches or stagnant pools of water (cesspool) have become a source of water supply for roadside gardeners. Furthermore, they indicated that, because of the frequent breakdown of sewerage treatment plants, most raw sewage passes untreated into nearby drains or water courses. They also insisted that the Odaw river, which is the main source of water supply for gardeners in the Ring Road North Industrial area, is the heaviest polluted water course in the metropolitan area, receiving toxic wastes from surface run-off and untreated sewage from broken down sewerage plants. Hence, the reliance on drainage water and the Odaw river by gardeners to irrigate and wash their vegetables, according to the health official of the PHD, posed a significant health risk to the public.

A microbiological investigation was conducted by Ofori (1980) for seven drainage sites in Accra on behalf of the PHD. The investigation revealed a high incidence of faecal pollution
along the banks of drains used for watering vegetables (Table 7.4). It showed a close positive correlation between total coliform (TC) and faecal coliform (FC) densities of both water and vegetable samples, which is an indication that the source of the vegetable contamination is the drainage water.

Table 7.4

Total (TCC) and Faecal (FCC) Coliform Concentrations (per gram) of Water and Vegetables (Lettuce and Cabbage)

<table>
<thead>
<tr>
<th>Station</th>
<th>TCC</th>
<th>FCC</th>
<th>Water</th>
<th>TCC</th>
<th>FCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ring Road East (Fair)</td>
<td>3.30</td>
<td>0.40</td>
<td>16.00</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>Ring Road Central - NSCB</td>
<td>350.00</td>
<td>79.00</td>
<td>160.00</td>
<td>160.00</td>
<td></td>
</tr>
<tr>
<td>Ring Road Central - STC</td>
<td>350.00</td>
<td>7.90</td>
<td>350.00</td>
<td>0.50</td>
<td></td>
</tr>
<tr>
<td>Achimota Road - Dzorwulu</td>
<td>130.00</td>
<td>79.00</td>
<td>11.00</td>
<td>3.30</td>
<td></td>
</tr>
<tr>
<td>Achimota Road - Kao Kudi</td>
<td>0.05</td>
<td>0.02</td>
<td>160.00</td>
<td>100.00</td>
<td></td>
</tr>
<tr>
<td>Airport Residential - CSIR</td>
<td>54.00</td>
<td>35.00</td>
<td>16.00</td>
<td>0.50</td>
<td></td>
</tr>
<tr>
<td>Adabraka - Odoma</td>
<td>49.00</td>
<td>49.00</td>
<td>92.00</td>
<td>35.00</td>
<td></td>
</tr>
</tbody>
</table>


Table 7.4 indicates that almost all the sample areas had faecal coliform counts in excess of the recommended maximum limit of 5 per gram. Thus, the result clearly revealed that vegetables irrigated with drainage water from these sampled sites could be contaminated and this could pose health risk to humans as many of these vegetables are eaten fresh. However, an analysis of trace metals concentrations in vegetable crops grown in some selected sites in Accra by Environmental Management Associates (EMA) in 1989 revealed a low level of concentration (Table 7.5). The EMA conducted this analysis for four sample sites in the areas of Ring Road East (near Flair Catering), Ring Road Central (near National Savings and Credit Bank), Accra Central (near Novotel) and Airport Residential Area (near Council for
Scientific and Industrial Research). The result indicated that Cd and Hg are barely detectable.
The mean lead concentration of 1.1 mg.g\(^{-1}\) fresh weight is less than the recommended WHO value of 2.0. The proximity of the vegetable gardens to major roads (Ring Road East and Ring Road West) accounts for high atmospheric and water pollution by Pb. All the other elements occurred below the WHO recommended maximum permissible limits. On the whole, it appears that, unlike faecal concentrations, accumulation of trace metals in edible flora has not occurred to the extent which might be harmful to humans in some parts of Accra. The low levels are attributable to the limited discharges into the environment of contaminants containing trace metals as activities which may introduce these trace metals into the environment including burning of fossil fuels and industrial operations are minimal in Accra due to low level of industrialization. However, it is very important to stress that monitoring the levels of trace metals in these areas is still necessary, especially in view of the anticipated expansion and diversification of industrial operations to be generated by the SAP's Economic Recovery Program.

The second reason for official concern has to do with the potential water contamination emanating from the activities of the urban gardeners. The AMA has “accused” some urban gardeners of illegally tampering with fitted water connections by breaking water pipes or loosing pipe joints to tap water to irrigate their farms. Beside causing economic damages, such tampering has been a source of local contamination of drinking water supply as most water pipe connections run through cesspools and gutters. In most cases, squatter gardeners are accused of this act because of their illegal occupation. Some taps in low-income areas such as Accra New Town, Nima and Maamobi neighborhoods had faecal counts greater than the recommended level (Benneh et. al. 1994). Overall, in Accra, 12% of the water taps sampled by Benneh et. al. (1994) exceeded the WHO guidelines of 0/100 ml for faecal count levels. According to Benneh et. al. (1994) water supplies from the Ghana Water and Sewerage
Corporation's treatment plants are regularly tested and generally found to be of good quality and bacteria-free. Therefore, the presence of any contamination including faecal bacteria in the water source suggests contamination within the distribution system partly as a result of urban cultivation.

Another form of contamination comes from waste emanating from the activities of the gardeners in Accra. The eastern part of Accra is supplied with water from the Densu river, and in recent years the river has become increasingly polluted from domestic sanitary waste and fertilizers used in crop production (Accra Planning and Development Program, 1992). Also, the Odaw river and the Korle and Chemu lagoons have recorded high levels of Dissolved Oxygen (DO) due to the excessive amounts of untreated domestic, industrial and agricultural wastes they received.

Thus the Biochemical Oxygen Demand (BOD), which is an index of organic loading and therefore of the quality of water as a whole, is high in these water bodies, and this is partly attributed to organic waste from urban cultivation and partly to sewage and solid wastes from industrial activities. These water bodies recorded high concentrations of nutrients such as orthophosphate (PO4-P), ammonia (NH3-N) and nitrates (NO3-N) from urban farming, and these also lower the quality of the drinking water (Table 7.6). The subsequent rise in the organic content of the Densu River and as well as the Weija River is increasing the cost of water treatment from these sources, and the AMA is concerned that if steps were not taken to reduce the flow of organic wastes (especially, nitrogen compounds) into these water bodies, in the very near future, the cost of treatment will be prohibitive.
Table 7.5

Trace Metal Concentration in Vegetables Grown in Selected Sites in Accra (ug.g⁻¹ FW)

<table>
<thead>
<tr>
<th>Sample</th>
<th>Location</th>
<th>Hg</th>
<th>Cd</th>
<th>Pb</th>
<th>Cu</th>
<th>Zu</th>
<th>Mn</th>
<th>Fe</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lettuce</td>
<td>RRE</td>
<td>0.017</td>
<td>0.05</td>
<td>1.76</td>
<td>0.45</td>
<td>3.02</td>
<td>5.58</td>
<td>93.5</td>
<td>48.5</td>
</tr>
<tr>
<td></td>
<td>RRC</td>
<td>0.010</td>
<td>0.05</td>
<td>0.88</td>
<td>0.20</td>
<td>2.83</td>
<td>2.69</td>
<td>38.4</td>
<td>10.3</td>
</tr>
<tr>
<td></td>
<td>AC</td>
<td>0.010</td>
<td>0.05</td>
<td>1.49</td>
<td>0.43</td>
<td>3.77</td>
<td>1.72</td>
<td>36.3</td>
<td>8.1</td>
</tr>
<tr>
<td></td>
<td>ARA</td>
<td>0.084</td>
<td>0.05</td>
<td>0.53</td>
<td>0.42</td>
<td>2.60</td>
<td>-</td>
<td>10.5</td>
<td>-</td>
</tr>
<tr>
<td>Carrot</td>
<td>AC</td>
<td>0.010</td>
<td>0.05</td>
<td>0.94</td>
<td>1.62</td>
<td>3.81</td>
<td>1.47</td>
<td>7.1</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>ARA</td>
<td>0.076</td>
<td>0.05</td>
<td>0.37</td>
<td>1.14</td>
<td>2.89</td>
<td>-</td>
<td>13.2</td>
<td>-</td>
</tr>
<tr>
<td>Green Peper</td>
<td>RRC</td>
<td>0.010</td>
<td>0.05</td>
<td>0.28</td>
<td>0.45</td>
<td>2.24</td>
<td>0.81</td>
<td>5.0</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>ARA</td>
<td>0.058</td>
<td>0.05</td>
<td>0.31</td>
<td>0.34</td>
<td>1.41</td>
<td>-</td>
<td>3.5</td>
<td>-</td>
</tr>
<tr>
<td>Onions</td>
<td>AC</td>
<td>0.010</td>
<td>0.05</td>
<td>1.77</td>
<td>0.20</td>
<td>1.84</td>
<td>1.02</td>
<td>10.8</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>ARA</td>
<td>0.086</td>
<td>0.05</td>
<td>0.43</td>
<td>0.45</td>
<td>2.50</td>
<td>-</td>
<td>13.4</td>
<td>-</td>
</tr>
<tr>
<td>Cucumber</td>
<td>RRE</td>
<td>0.014</td>
<td>0.05</td>
<td>0.86</td>
<td>0.20</td>
<td>1.19</td>
<td>0.53</td>
<td>5.36</td>
<td>0.5</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>RRC</td>
<td>0.010</td>
<td>0.05</td>
<td>1.40</td>
<td>0.21</td>
<td>4.70</td>
<td>5.12</td>
<td>16.0</td>
<td>7.8</td>
</tr>
<tr>
<td>Okro</td>
<td>RRE</td>
<td>0.033</td>
<td>0.05</td>
<td>1.96</td>
<td>0.60</td>
<td>4.67</td>
<td>2.81</td>
<td>4.9</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>RRC</td>
<td>0.010</td>
<td>0.05</td>
<td>0.45</td>
<td>0.58</td>
<td>3.05</td>
<td>1.15</td>
<td>5.6</td>
<td>0.5</td>
</tr>
<tr>
<td>Beans</td>
<td>RRE</td>
<td>0.010</td>
<td>0.05</td>
<td>1.10</td>
<td>0.20</td>
<td>5.70</td>
<td>3.96</td>
<td>6.5</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>RRC</td>
<td>0.010</td>
<td>0.05</td>
<td>1.79</td>
<td>1.27</td>
<td>10.7</td>
<td>5.56</td>
<td>28.9</td>
<td>8.2</td>
</tr>
<tr>
<td>Garden Eggs</td>
<td>RRE</td>
<td>0.010</td>
<td>0.05</td>
<td>1.10</td>
<td>1.27</td>
<td>2.32</td>
<td>1.83</td>
<td>2.1</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>RRC</td>
<td>0.010</td>
<td>0.05</td>
<td>1.79</td>
<td>0.20</td>
<td>2.81</td>
<td>1.45</td>
<td>7.4</td>
<td>8.8</td>
</tr>
</tbody>
</table>

| Mean         | 0.019     | 0.05  | 1.10 | 0.63 | 3.92 | 6.04 | 23.5 | 8.9  |
| WHO Limit    | 0.500     | 2.00  | 2.00 | 10.00 | 1000 |

RRE = Ring Road East  RRC = Ring Road Central  AC = Accra Central  ARA = Accra Residential Area

Table 7.6

Some Physico-Chemical Characteristics of Stream Water for Drinking in Accra

<table>
<thead>
<tr>
<th>Element</th>
<th>R</th>
<th>Densu Reservoir</th>
<th>Odaw River</th>
<th>Nima Creek</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>(7.00)</td>
<td>7.20*</td>
<td>8.90*</td>
<td>6.90</td>
</tr>
<tr>
<td>DO</td>
<td>(7.00)</td>
<td>6.80</td>
<td>2.10</td>
<td>7.10</td>
</tr>
<tr>
<td>BOD</td>
<td>(1-3.0)</td>
<td>4.50*</td>
<td>55.00*</td>
<td>5.80*</td>
</tr>
<tr>
<td>P04-P</td>
<td>(0.02)</td>
<td>0.13*</td>
<td>1.28*</td>
<td>0.26*</td>
</tr>
<tr>
<td>NH3-N</td>
<td>(0.02)</td>
<td>0.08*</td>
<td>0.40*</td>
<td>0.42*</td>
</tr>
<tr>
<td>NO3-N</td>
<td>(0.23)</td>
<td>0.50*</td>
<td>0.32*</td>
<td>0.40*</td>
</tr>
</tbody>
</table>

R = Recommended WHO limit
* = Exceeds recommended WHO limit

Source: Government of Ghana, 1989

7.2.3 Compost-Based Contamination

The health and planning officials of the Accra Metropolitan Authority were also concerned, to a limited extent, about the use of domestic compost in the production of food. Although, they recognized the environmental benefit of using urban compost in farming they were worried of the environmental problems associated with inappropriate application and management of domestic or home-made compost by some gardeners. The PHD is concerned about the trace element content in urban compost which is reported to be 10-100 times higher than in stable manure (Table 7.7). Thus, because there is no institutional recognition and support for urban farming in the AMA, urban farming has remained an unregulated activity which has led to indiscriminate use of organic waste by gardeners.

According to the PRO of the AMA, inappropriate application of urban compost could be injurious to public health, and this possibility is more likely because many urban gardeners are illiterate, with little or no knowledge about the use of composting. Scientific evidence supports the fears of the AMA that heavy application rates of sewage sludge and poultry manure could lead to the release of higher levels of nitrogen as inorganic nitrogen, possibly as ammonia.
Hence, excessive application rates could lead to pollution of surface and ground water by nitrate-N, through run-off and leaching (Hauck and Ofori, 1982). According to the PRO, for official acceptance of the use of domestic compost, there is an urgent need to establish maximum allowable safe limits for trace and heavy metals in compost for crop production, and such materials should be made available for regular testing and monitoring. Research on the safety of using compost for food production has been conducted by several institutions, including the World Health Organization, the FAO, the World Bank, the US Environmental Protection Agency and the Asian Institute of Technology. These institutions have found the use of organic wastes to be beneficial for farming as well as resource conserving only if appropriate guidelines for use and standards for treatment are put in place.

Table 7.7

Trace Metal Concentration in Compost and Unpolluted Soil in Accra.

<table>
<thead>
<tr>
<th>Trace Metal</th>
<th>Compost</th>
<th>Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hg.</td>
<td>0.09</td>
<td>0.02</td>
</tr>
<tr>
<td>Cd</td>
<td>0.32</td>
<td>0.10</td>
</tr>
<tr>
<td>Pb</td>
<td>105.00</td>
<td>7.10</td>
</tr>
<tr>
<td>Cu</td>
<td>52.00</td>
<td>0.10</td>
</tr>
<tr>
<td>Zn</td>
<td>320.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Mn</td>
<td>110.00</td>
<td>53.00</td>
</tr>
<tr>
<td>Fe</td>
<td>4,464.00</td>
<td>1,390.00</td>
</tr>
</tbody>
</table>


Furey and Chowdhury (1996) presented a "good news" message for the health aspects of using organic waste in urban agriculture. They suggested that the actual health risks for any category of people depend largely upon their general health status, what immunities they have acquired, their hygiene habits and their general living conditions. They asserted that the poorer the environmental conditions and the economic status of a community, the less the residents may be susceptible to some of the risks from waste reuse.
Their argument was that most participants of urban farming have low economic status, hence they are exposed to multiple sources of infection and with time they become less susceptible to infections associated with reusing organic wastes for food production. They also concluded that "with virtually no research on the etiology of disease specifically resulting from urban agriculture practices, health departments have little to guide them in assessing the actual risk of waste re-use". Hence, vague generalization about the public health effects of the use of organic waste in urban cultivation should be avoided and regulatory framework should be established to reflect and manage real scientific concern.

7.2.4 Legislation and enforcement

In response to the growing concern about public health and environmental effects of urban agriculture in Accra, the Accra Metropolitan Authority in 1989 requested its sub-committee on Environment, Health and Sanitation to review, among other things, the activities of vegetable growers in Accra. At its meeting on 14th August 1990, the Chief Mechanical Engineer of the AMA, Mr N.A. Armah, submitted a memorandum on wayside gardening in Accra (Appendix B). He recommended that wayside gardening in some parts of the inner city should be stopped and the affected gardeners be resettled outside the city. Armah provided various reasons to support his recommendation. These include: one, to irrigate their gardens, urban gardeners dammed sewage drains for the collection of drain water, thereby interfering with the flow of drainage; two, by preparing the land for planting, urban gardeners disturb the vegetative cover, especially exposing the soil to wind and water erosion which progressively lead to siltation in drains; three, the silted drains become fertile breeding grounds for mosquitoes, aggravating the unsanitary condition; four, making holes in the lining of the drains, urban gardeners weakened the structures of the drains which progressively results in the destruction of the drains; five, health hazards are imposed by the use of drain water and
effluents to irrigate crops; and six, urban gardeners, tamper with the fittings of water connections and break water pipes to gain access to water to irrigate their crops. Although, Armah's concerns may be centering on modernizing the city, in real sense, his fears are genuine in respect of the potential of gardening activities causing some environmental problems such as pollution, erosion and siltation.

The Waste Management Department supported Armah's recommendation, and the Accra Metropolitan Assembly, subsequently, approved the recommendation. In approving the recommendation, the Assembly also requested that affected gardeners be resettled in an orderly fashion in the outskirts of the city to enable them carry their activity in a more scientific and hygienic manner. In this regard, a request was sent by the Director of Administration of the AMA, Mr K.E. Dennis, to the Chief Executive of the Irrigation Development Authority to request for land to resettle the displaced roadside gardeners (Appendix C). The then acting Managing Director of the Weija Irrigation Company, Mr B.C. Attipoe, granted the request and made provision for land near Weija to resettle the affected farmers (Appendix D). The committee's recommendation on stopping wayside gardening attracted public outcry and unfavorable press reports, and these slowed down the implementation process.

The resettlement of the urban gardeners in Weija, about 14 km. east of Accra (Fig.1.1), brought mixed blessings to the affected gardeners. On the positive side, they were resettled near an irrigation project, Weija Irrigation Project, which made possible the supply of irrigation water throughout the year, regular access to extension services, and formation of a co-operative scheme. The co-operative scheme is divided into an experimental farm of 7 hectares and a co-operative farm of about 225 hectares with 200 farmers. There were 4 co-operatives of 50 farmers each. Each co-operative is further sub-divided into 5 distinct groups of 10 farmers. Before planting is completed, all the farmers work in groups, but immediately after planting the farms are apportioned to individual farmers. Each cooperative unit is assisted by a
Farm Extension Officer who gives technical assistance to the farmers. The farm activities of the co-operative units are co-ordinated by the Deputy Farm Manager. The Secretary of the Cooperatives and the leaders of the various groups liaise between the members of co-operative and the management of the project for the supply of farm inputs. The costs of the inputs supply to the gardeners are debited to their accounts and the value of the output bought from them is credited to their account. Advances are given to the farmers against their bulk payment to enable them meet their immediate financial obligations. The management controls the supply of farm inputs to the farmers, monitors their farming activities and controls the production and supply of the farm produce. Thus, there is less room for farmers' creativity and initiative in the management of their farm enterprise. However, the cooperative farming facilitates easy access to credit and organized marketing.

On the negative side, the relocation distorted gardeners' normal rhythm of cultivation and other activities which were tuned to their farming rhythm. Furthermore, the vast distance between gardener's home and the resettled site increased the cost of transportation. Additionally, gardeners have to incur additional costs associated with the use of land and water, costs which hitherto they did not incur as they cultivated utility land and used stream water free of charge. Furthermore, the basis for selecting farmers to participate in the project was made purely on the commercial viability of the gardener's cultivation. Thus, the selection process excluded gardeners who practiced subsistence cultivation. Finally, gardeners were required to cultivate a minimum of 1 hectare (2.5 acres) of land; however, a plot of that size is too large for one person to cultivate exotic crops, profitably, on an intensive basis.

A feasibility study of the operation of the Weija farmers' cooperative (Weija Irrigation Project) conducted by the Ghana Institute of Management and Public Administration (GIMPA) revealed chilling results. According to the report, the cooperative scheme did not consider the financial profitability of the cultivation by the individual gardeners as the project seemed to be
interested in cultivating food at a cheap rate for the urban residents (GIMPA, Management Series, 1992). The report also revealed that there was no "co-operative spirit" instilled in the farmers as the Department of Co-operatives has not shown any interest in the farmers co-operative in Weija. The report also mentioned that, in the selection process, migrant farmers from the surrounding fishing villages were given priority over the displaced roadside gardeners from the inner city. Later, commercial farmers who were willing to pay for the use of water were given the most priority. Furthermore, the review noted that an opportunity exists to promote the use of organic manure among the gardeners as there was a close link among the Weija Irrigation Project, the Waste Management Department of AMA and the various compost sites. But this opportunity seems not to be noticed as the project continue to rely very much on chemical fertilizer, the choice made by the bureaucratic hierarchy.

A series of metropolitan by-laws promulgated in 1995 also affected urban cultivation in Accra. Specifically, six components of the by-laws have direct implications for urban cultivation in the metropolis. These are by-laws on "Growing and Sale of Crops(GSC)", "Control of Swine, Cattle, Sheep and Goats (SCSG)", "Solid and Liquid Wastes Management (SLWM)", "Control of Poultry in Dwelling Houses (CPDH)", "Drainage of Waste Water (DWW)" and the "Control of Dried Foodstuffs (CDF)". Section 1 of the GSC by-law states that "no person shall grow crops at a place other than on land within his/her premise unless he/she has registered with the Medical Officer of Health (MOH) furnishing him with his name and address and the description of the site where the crops are to be grown". This law implies that farming - other than in the backyard or front yard - is illegal unless permission is sought from, and granted by the MOH. Since the Public Health Department (PHD) is already skeptical about the operation of urban gardeners, it implies that if the cultivation is to be done outside the premises, the MOH is empowered to legally restrict the activity without any tangible justification. Although gardeners ignore this by-law as its enforcement is relaxed, the spirit and the content of the law basically
discourage urban farming. A strict implementation of this bye-law could be a disaster for urban farming in Accra.

Similarly, Section 2 of the GSC by-law also stipulates that "no crops shall be watered or irrigated by drain water, or effluent from premises or street drainage." The intention of this law is to prevent water-based food contamination. However, as already noted, there is little scientific basis to restrict the use of drain water to irrigate gardens, as available evidence suggests that the level of trace metal concentration is below the level which might be harmful for humans, although there is a real concern for faecal contamination. This legislation is more disturbing if one considers Section 6 (1), which requests the MOH to declare any crops irrigated with drain water unfit for human consumption. Although, one has to be concerned about potential health effects from the use of contaminated water to irrigate crops, the total and outright ban of the use of drain water without a strong scientific basis is questionable. Instead of promulgating a law banning such activity efforts should rather be geared towards educating the gardeners, conducting more scientific studies to assess the agricultural suitability of drain water site by site, and exploring means of how to biologically treat such contaminated water to become suitable for urban agriculture.

Section 6(2) mentioned that "no crops declared unfit for human consumption shall be sold, offered or displayed for sale as human food." This is also disturbing if one considers the fact that the PHD can easily discriminate against urban farming, as it is already opposed to the practice. Section 9 (1) identifies the crops affected by this legislation to be lettuce, cabbage, onions, radish, cucumber, watermelon, and any crop which is likely to be eaten in an uncooked state. Section 4 also limits the ability of the gardeners to market their produce. It stipulates that "no crops shall be sold, offered or displayed for sale at any other place than in a market, stall, store or kiosk". This implies that the sale of garden produce on the farm or along roadsides is illegal. This is clearly specified in Section 5 which says that "no crops shall be
displayed for sale on a road, pavement and sidewalk”. As already noted, roadside and on-the-farm marketing constitute significant means by which gardeners dispose off their produce for sale. Hence, this particular legislation is likely to reduce the channel through which most gardeners market their produce.

Although the SLWM by-law did not make any explicit statement to discourage the use of animal droppings as garden manure, the limitation imposed on the number of poultry to be kept at 200 heads in a dwelling-housing of 304 square meters (Section 1[1] of the CPD bye-law) and the number of goats and sheep to be kept at 10 (Section 1[3] of the SCSG), to some extent, goes to reduce the supply of animal droppings to manure the gardens. Also, Section 6 (1) of the SLWM by-law banned the straying of animals outside the premises of their owners. Thus, this regulation also limits the potential of goats and sheep to becoming recyclers of organic wastes and, subsequently, providers of organic manure to urban gardeners. In addition, Section 5 (1) of the bye-law requires that “poultry droppings should be disposed of accordance with the Medical Officer procedures and law governing sanitation”. The Public Health Department, which is zealously concerned about the health implication of urban agriculture, is likely to impose stringent regulations regarding the use of poultry droppings on gardens.

Finally, Section 1 of the SLWM by-law stipulates that “the AMA has the exclusive responsibility for the disposal and management of both solid and liquid wastes in the city, hence every household, industry, and office should make their wastes available to the AMA”. This implies that it is illegal for gardeners to use directly any organic waste on their farms, although the AMA does not have the resources to collect all wastes. Such wastes, by law, are to be made available to the AMA who then pass it on to anyone interested in re-using it. This process could prolong the process of acquiring organic waste and limit gardeners' access to organic manure in Accra. Under Section 7 of the GSC by-law, anyone who contravenes any of
the by laws is liable to a fine not exceeding 100,000 cedis or, in default of the payment of the fine, to a term of imprisonment not exceeding three months or both.

Whereas the AMA by-laws, in the interest of so-called public health, unjustifiably restrict the activities of urban cultivation in Accra, a prior enactment of the 1989 Accra Metropolitan Assembly Establishment By-laws was supportive. The 1989 By-law, which established the metropolitan assembly, a grassroots legislative body, provided a legislative framework by which urban cultivation could be tolerated and encouraged. For instance, Section 54 of the enactment assigned the AMA "to be responsible for the improvement of agriculture including extension services and allotments for agricultural purposes", while Section 56 requires the AMA "to allocate land in the ownership of the AMA for farming purposes and to regulate the system of farming of such land". These two sections provide legislative support to urban agriculture in the areas of official recognition, resource support, and the need to regulate and monitor urban agriculture.

Furthermore, Section 62 of the by-law recognizes the economic significance of urban cultivation in the household economy of the people of Accra when it stipulates that the AMA should "take every step to encourage persons to plant specified crops for the maintenance of themselves and the families" while Section 65 requires the AMA "to establish and manage, on commercial basis, small-scale industries and farms". In addition, Section 71 requires the AMA "to compile and maintain a record of all tenant farmers and the rents and tribute which should be paid". The inventory of all tenant farmers is significant in providing base line information about gardeners in Accra. Finally, the Local Government Act 462, which was promulgated in 1993, outlines the planning functions of the newly created District Assemblies and stipulates in Section 51 (3) that "[s]ubject to this Act .... the following activities shall not require prior permit from a District Planning Authority; a) subsistence farming and; b) small-scale vegetable and flower gardening."
To conclude this chapter, two observations can be made. One, the current official response to urban cultivation in Accra is not definitive and quite ambivalent, ranging from discouraging to supportive. While, on one hand, the 1995 Accra Metropolitan Authority by-law seems to discourage and limit the activities of the sector, on the other hand, the 1989 Accra Metropolitan Assembly Establishment Act outlines some supportive roles that the AMA should play toward urban cultivation. Thus, at the level of legislation, the official response of the Accra Metropolitan Assembly to urban cultivation is encouraging but at the level of implementation, the official response of the Accra Metropolitan Authority is discouraging. This situation emerges because there is a weak link or poor coordination between policy making of the Accra Metropolitan Assembly and policy implementation of the Accra Metropolitan Authority, which could be attributed to the weakness of the democratic process in Ghana.

The second observation that can be made is that the various health concerns expressed against urban agriculture are about potential rather than inherent problems. This implies that, if practiced properly, urban agriculture can resolve most of these potential problems and become a sustainable initiative. This also requires that concerns that are genuine should be resolved through regulation and institutional support in the area of official recognition, land use zoning, and input supply. Thus, institutional restriction or intolerance of urban agriculture is not an effective solution to its potential problems - whether real or imagined. For instance, there should be a regional and locally co-ordinated regulation to ensure that waste water or sludge is treated by a process that will significantly reduce pathogens before its application on land. The processes that are considered acceptable include air drying of garden beds for at least three months and lime stabilization of garden beds (Younos, 1987). Other considerations include requiring that the annual rate of waste water or sludge application should not exceed 0.5 kg/ha; soil pH (top 6 cm) should be 6.5 or
greater at time of application, and that wastewater or sludge should be applied directly to the soil and not to any human food crop.
Chapter Eight

Future Prospects, Policy Recommendations and Conclusion.

Based on the field survey, this chapter provides evidence to support the assertion that urban cultivation in the AMA is not a temporary, marginal activity but a long-term initiative on the part of some urban residents to eke a living out of their natural environment. The chapter also provides a summary of the various research findings, based on which, the author offers policy recommendations on how to encourage urban cultivation as a sustainable urban initiative through land use changes, legislative reform, and institutional support. Finally, the chapter outlines some strengths and limitations associated with the research, and proposes a research agenda that should be pursued to advance this type of study.

8.1 Urban Cultivation in Accra: A Stop-Gap Measure Or A Long-Term Initiative?

Based on the analyses of the role of urban agriculture in the household economy of Accra, it is the author's contention that urban agriculture in the AMA is not a temporary, stop-gap measure to combat food scarcity but a permanent initiative on the part of the urban poor to improve their standard of living. Thus, urban cultivation should be seen as part of a long-term phenomenon to transform the urban landscape in Accra to the realities of urban needs and priorities. Even in the face of a restrictive institutional policy, it is the author's contention that urban cultivation will survive into the future and remain a significant activity in Accra. This conclusion is based on the gardeners' responses to some questions posed in the interview and the analysis of the land use pattern in Accra.

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In the questionnaire, I explored how long urban gardeners have lived in Accra, and the various responses reveal that most of the gardeners are not recent immigrants in Accra but have lived in the metropolis for more than two decades. Thus, 68.3% of the urban gardeners have lived in Accra for more than 20 years while only 21.6% of them have stayed in Accra for 10 years or less (Fig. 8.1). This result indicates that most gardeners are long-term residents of Accra and well established in the metropolis, thus disproving the popular assumption that participants of informal sector activities are recent immigrants who lack the necessary skills to enable them to integrate fully into the urban formal economy.

To complement the above inquiry, a question was posed to the gardeners as to how long they have been practicing urban gardening in the metropolis. The responses revealed that 71.5% of the urban gardeners had been practicing urban farming for more than a decade; 40% for a period of more than 20 years and 23.1% for a period of more than 25 years (Fig.8.2). The gardeners' long-term continuous cultivation of food provides a strong indication of the long-term viability of urban farming as a provider of sustenance to the urban gardeners. This finding thus over-turns a popular opinion that urban cultivation is a temporary activity undertaken by recent immigrants whose interest in urban agriculture is likely to fade with time as they become adapted to their new urban environment.

In response to a question regarding how far into the future the gardeners will likely continue the practice of urban cultivation, 37% of the gardeners indicated over their lifetime, 16.7% indicated between 10-15 years, while only 8% indicated that they will likely end their farming activities within the next two years (Fig.8.3). Thus, about one-third of the gardeners have the intention of engaging in urban cultivation for life while more than three-quarters of the gardeners expressed their intention of practicing urban cultivation at least over the next 10 years. This finding suggests that urban agriculture has a great future in the economy of Accra.
Fig. 8.1 How Long Gardeners Have Lived in Accra

Source: Author's Field Survey, 1998
Fig. 8.2 How Long Urban Gardeners Have Been Involved in Farming in Accra

Source: Author's Field Survey, 1996
Fig. 8.3  How Long Gardeners Are Willing To Continue With Urban Cultivation

Source: Author's Field Survey, 1996
and should not be seen as a transitory attempt or short-term measure to combat food shortage in the metropolis.

It is also a widely held assumption that urban agriculture is the first occupation engaged in by immigrants to survive in the new urban environment and that they are likely to quit the activity the moment they secure other jobs. However, the survey reveals that 68% of the urban gardeners hold other jobs in the metropolis and are involved in urban cultivation as a part-time activity. Thus to these gardeners, their initial occupation was not farming but they began after they realized that their present occupation was not enough to support their household food and other requirements. Specifically, 25% are employed as "watchmen", 22% as artisans, 11% as market traders, 10% as commercial drivers, 6% as teachers, and 9% as receptionists, accountants and agronomists. Almost 32% are otherwise unemployed and are thus involved in urban farming on a full-time basis. The Ghana Statistical Service (1995) estimated that, in Ghana, 600,000 economically active people have a main job which was non-agricultural but a second job which was agricultural.

Thus, overall, a majority of the gardeners are involved in occupations other than farming; hence, one is compelled to conclude that despite secure employment, gardeners are likely to engage in, and continue with their, farming practices. This is an indication of the permanency of farming in the occupational structure of Accra and thus disposes of the myth that the practice of urban agriculture is dominated by individuals who are likely to quit cultivation the moment they secure other jobs. This conclusion is further buttressed by the fact that 72% of gardeners indicated that, even if offered jobs with cash remuneration equivalent to what they currently earn from their gardens, they are unlikely to stop farming.

Apparently, the low horizontal mobility of urban agricultural labor, which stems from the fact that urban cultivation offers flexibility, allows gardeners to easily combine farming activity with any new-found urban jobs. Furthermore, that most gardeners are from diverse
occupational backgrounds provides a strong indication that urban cultivation is not only practiced by the poor, but also by individuals with higher socio-economic background who are involved in cultivation, not out of necessity, but because they consider the activity worthwhile and satisfying. This is buttressed by the result that a majority of the gardeners (68%) are literate with some level of education. This undermines the assumption that urban agriculture is an activity of the illiterate and marginal who cannot compete for employment in the formal sector. Although 32% had no formal education, 28% had secondary or post-secondary education, and this latter group is more likely to be innovative as they seek information and adopt improved farming techniques, in contrast to the rural farmers who had to be approached by extension officers to be introduced to improved farming practices. Furthermore, the involvement of educated individuals in urban cultivation could provide the means by which local and national policy could be influenced in favor of urban agriculture, as the tendency exists for such educated gardeners to form strong alliances to articulate their concerns effectively to the appropriate authorities.

The prospect of urban cultivation surviving and persisting can be seen in its adaptability to a wide range of land types in Accra. Thus, the prospect of urban farming in Accra to produce diverse types of crops and employ different methods of production has enabled the activity to occupy an enormous range of niches in the metropolis, such as idle lands, backyards, front yards, lands beneath power transmission lines, stream banks, land adjacent to drainage systems, roadside verges, institutional lands, metropolitan parks and garbage dumps - which are devoid of any physical development. Thus, gardeners can access a wide range of urban land and they are less likely to be restricted by the limitations imposed by intense competition and development of urban land in Accra, as these lands (utility lands) provide a secure niche to sustain the growth of urban cultivation in the future. Furthermore, in the near future, the problem of land encroachment could have less effect on urban farming as
gardeners adopt more intensive methods of production which require less space, especially for the cultivation of exotic vegetables.

The future prospects for cultivation in Accra can also be assessed from the changes in the general pattern of land use that occurred between 1960 to 1988 along the Airport-Ayimensah transect (the outer city section). In a survey, Kufogbe (1988) observed, along this transect, an increase in agricultural land use by 84% while vacant plots decreased by 95% between the period 1960 and 1988. Thus, between the period 1960-80 and 1980-88, the number of plots used for agricultural uses increased from 79 (28% of total plots along the Airport-Ayimensah transect) to 146 (50%) while residential uses increased from 22 (8%) to 78 (27%). Kufogbe also observed that, for similar periods, the number of vacant plots decreased from 177 (62%) to 8 (3%) while the number of mixed uses, which refer to land used for any combination of residential, agricultural and commercial uses, increased from 7 (3%) to 58 (20%). Thus, during the period 1980 to 1980, vacant lands were more dominant in the outer city than any other form of land use, accounting for 177 plots (62%) out of the total number of 285 plots. However, between 1980 and 1988 most of these vacant lands were utilized for other purposes, with agriculture being the major benefactor, accounting for 50% of all land use in the outer city.

Table 8.1 The Number of Plots Devoted to Various Land Uses and Changes Along the Airport-Ayimensah Transect in the Outer City, 1960-88

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<tbody>
<tr>
<td>Residential</td>
<td>22 (8%)</td>
<td>78 (27%)</td>
<td>56 (246%)</td>
</tr>
<tr>
<td>Agricultural</td>
<td>79 (28%)</td>
<td>146 (50%)</td>
<td>67 (85%)</td>
</tr>
<tr>
<td>Mixed</td>
<td>7 (2%)</td>
<td>58 (20%)</td>
<td>51 (729%)</td>
</tr>
<tr>
<td>Vacant</td>
<td>177 (62%)</td>
<td>8 (3%)</td>
<td>-169 (-9%)</td>
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1 The size of a plot is measured by 70x100 feet.
Thus, if not limited by future haphazard physical expansion, the outer city provides a great opportunity for the future expansion of farming in the AMA. The above analysis underscores the growth potential of agriculture as a land use activity in the study area. This is buttressed by the fact that more than 50% of the gardeners indicated that they will cultivate additional lands if they become available to them.

8.2 Summary of Research Findings

It is appropriate at this juncture to assess what has been accomplished in the light of the research objectives. The research has revealed a number of significant findings about the role of urban cultivation in the space and household economy and urban management in Accra, and the tremendous role it can play in achieving overall urban sustainability in Accra.

In exploring events and actions that have shaped farming in Accra over the years, it is a significant finding of the research that cultivation in Accra has been influenced by both favorable and unfavorable factors in the course of its evolution and development. Critical variables or factors that have favorably influenced cultivation in the metropolis include the colonial interest in exotic vegetable cultivation, the stationing of foreign troops in Ghana during the second world war, the declining profit of colonial trade, the establishment of the Department of Parks and Garden, USAID’s distribution of vegetable seeds, the return of Ghanaian refugees from Nigeria, the gloomy food situation in Ghana in the early 1980s, the repressive government actions against rural farmers and urban market women during the 1979 revolution, the FAO’s “Freedom from Hunger” campaign, the national “Operation Feed Yourself” campaign, and the implementation of the “Urban Ring Farm and “Roadside Farming” schemes.

On the other hand, urban cultivation has experienced some historical events which have discouraged the growth of the sector. These include the emergence of barter trade, the
boom of pre-colonial European trade, colonial land appropriation, transportation development
that linked Accra with the rural areas, the transfer of the national capital from Cape Coast to
Accra, cessation of the second world war and the withdrawal of foreign troops, the post-
independence industrialization drive, the development of the Tema Township, the demolition of
traditional areas, capitalist food production, and the government’s housing supply scheme.

In exploring the land use implications of urban farming in Accra, the research finds that
the difficulty in gaining access to urban land is a serious constraint facing cultivators in Accra.
This problem stems from plan making that is not related to plan implementation, as there are
more than five agencies responsible for the land delivery system in Accra. Also, the current
process of obtaining land is long, complex and fraught with difficulties, compelling prospective
developers to bypass the process to illegally develop areas, mostly green space, leading to a
problem of land litigation. The research revealed that five means of land access - private land
ownership, renting, public land, custodian land and squatter land - are associated with
cultivation in Accra. It is a significant finding of the research that the type of land access facing
an urban gardener, coupled with the value of the land, influences his/her motive for cultivation,
the type of crop to grow, where to locate the urban garden, and what method of production to
adopt.

Although some exceptions do exist, the research also revealed, generally, that the
spatial variation of urban land value in Accra, which decreases from the CBD towards the
urban periphery, significantly affects the configuration and preponderance of urban gardens in
Accra; urban gardens increase in size and frequency from the CBD towards the periphery. The
research also revealed that the varying distance of urban gardens to the city core, coupled
with the spatial variation of land value, produces a complex and divergent reaction to urban
farming in Accra, producing two major methods of food production in Accra - intensive and
extensive cultivation.
Intensive cultivation is characterized by the cultivation of exotic crops on small, raised bed. It involves the applications of organic manure, chemical fertilizers, pesticides and insecticides. The method relies on sophisticated implements and the use of stream water or pipe-borne water for all year round cultivation. Sowing is either direct for vegetable crops like carrots, or seeds are nursed and transplanted for crops like lettuce, onion and cabbage. Extensive cultivation, on the other hand, is characterized by the cultivation of indigenous crops on relatively larger, flat ground with simple garden tools. Sowing is by direct seeding with no or very limited applications of organic manure, chemical fertilizers, pesticides and insecticides. It relies on rainfall for moisture which supports two cultivation seasons per year.

A review of colonial and post-colonial land use regulations in Accra provides an indication that urban planning in Accra has not recognized cultivation as an urban land use activity, and as such have remained intolerant of the activity. Such intolerance has been expressed in the lack of zoning for urban cultivation, lack of protection for green space, harassment and intimidation of urban cultivators and appropriation of stool lands under community gardening.

The research also critically examined three urban development models currently being considered by the Accra Planning and Development Program for the future expansion of the city. This examination revealed that the urban consolidation model is likely to adversely affect farming in the inner city as land becomes intensively utilized and consolidated for physical development. However, gardening in the outer city is likely to be protected, as institutional regulation may curtail any further expansion of the built environment into the periphery, leaving most land vacant and available for food cultivation. The multi-city model is likely to facilitate urban cultivation in the inner city as there will be less demand on land in the inner city or no threat to existing vacant land or green space. However, urban cultivation in the outer city will adversely be affected as most of the newly created city centers will be sited on peri-urban
lands which are predominately under food cultivation. Finally, the twin city model is likely to impact less on inner city and outer city gardens but adversely impact on urban cultivation along the urban corridors and wedges between Accra and Tema as physical development is expected to focus on transportation corridors linking these two centers.

In an analysis of the advantages associated with the major gardening sites in Accra, the research reveals that backyard gardening possesses the advantages of higher land security, easier access to kitchen manure and low transportation cost. Roadside gardening, on the other hand, possesses the advantages of easy access to market and proximity to means of transportation, while stream-side gardening has the advantage of regular access to water which permits all-year round cultivation. Cultivation beneath power transmission lines also has the advantages of less land encroachment, wide stretches of garden plots which permit community gardening and facilitate resource pooling, and the benefit of economies of scale. Also, school gardening possesses the advantages of institutional support, scientific application and resource pooling.

The research modeled a three-phase transition of the relative (inner city or outer city) concentration or preponderance of urban cultivation across the urban space of Accra. The first phase, which is characterized by low physical development when the urbanization process is in its infancy, witnesses the domination of the inner city cultivation in Accra due to the comparative advantages of time, distance and market accessibility. The second phase witnesses the domination of the outer city over the inner city as the intense physical development in the inner city, due to the urbanization process, limits the availability of land for food cultivation in the city vis-à-vis the vast expanse of land in the outer city. In the second phase, urban cultivation in the inner city will be confined to backyard space, utility land, metropolitan parks and garbage dump sites; areas devoid of physical development. Finally, the third phase witnesses the diminishing role of the urban periphery in the production of food and
the regaining on the inner city in the domination of urban cultivation. This is because the niches (green space, backyard space, parks and utility lands) which allow urban cultivation in the inner city during the second phase will be non-existent in the outer city during the third phase if the outer city remains unplanned and haphazard developed.

The research finds that there is an inverse relationship between the size of the urban garden and its level of security. Thus, the more secure a land is (land ownership and utility land) the smaller is its size. This is because more gardeners are competing for the cultivation of such secure lands, and this leads to their fragmentation. Also, gardeners who cultivate the less secure land tend to cultivate a larger space to make up for any part of the land that might be lost due to future encroachment. The research also finds that garden plots in the inner city are relatively smaller than their counterparts in the outer city. This is because the inner city is dominated by the cultivation of exotic crops of which cultivation is more productive on smaller plots of well managed land. It also found that there is a weak statistical relationship between how long a gardener has stayed in Accra and the size of the garden plot he/she cultivates. However, there is a strong relationship between the size of garden plots and how long a gardener has been involved in urban cultivation. Thus, this suggests that duration of cultivation, and not duration of stay in Accra, is a stronger factor in determining the size of garden plot a gardener can cultivate. The research also finds that family size has no significant influence in the extent to which a gardener is involved in urban cultivation, instead involvement is driven by the level of household expenditure on food.

Although there is no significant difference between the overall number of men and women involved in urban cultivation in Accra, in the inner city, there are more women than men involved in urban cultivation while the male gardeners dominate the outer city. This is because female gardeners tend to cultivate the inner city because it is close to their place of residence which affords them with the opportunity and the flexibility of combining gardening with their
household chores. This also explains why female gardeners cultivate smaller spaces than their male counterparts as they are less burdened and able to attend to their household chores. Also, the critical role of women as managers of household subsistence has created the tendency for female gardeners to cultivate more secure lands, such as privately owned land and utility land, which could assure them a regular, uninterrupted supply of food to the household.

The research finds that urban cultivation benefits gardeners in terms of providing them with a regular, reliable source of food, generating income, reducing their household food budget and providing opportunities for employment. However, the extent to which gardeners benefit from urban cultivation varies on the basis of gender and the level of income of the gardeners as well as the location of the garden. The research finds that most of the gardeners are low-income earners, making urban cultivation an important activity of the urban poor. The significance of urban cultivation for the urban poor is further supported by the research finding that the lower the income of an urban resident, the more is the proportion of his/her income spent on food, making urban cultivation an important survival strategy to insulate the poor from market limitations. The research also revealed that not only does urban cultivation generate income for urban gardeners, but such income constitutes a significant portion of their household budget as more than half of the gardeners earn more income from urban cultivation than any other source. However, high-income gardeners derived, proportionally, more cash income from urban cultivation vis-a-vis their total income than their low-income counterparts. The crucial role that urban cultivation plays in the household sustenance is revealed by the high proportion of gardeners who indicated that had it not been urban cultivation, they would not have been able to meet their household food requirements.

The research also finds that urban cultivation possesses the potential for generating employment opportunities for the urban poor as it is characterized by low capital investment,
limited technical knowledge and labor intensive method of production. While the data from the Ghana Statistical Service and the Population Census Reports show a steady increase in the number of people engaged in agriculture in Accra over the years, the relative distribution of the data shows zonal variations which emphasize a decrease in the inner city and a general increase in the outer city. A profitability assessment of urban farming in Accra revealed that the extent to which urban gardeners derive profit from their activity is primarily determined by the cost they incur to secure the use of the land for farming, the season of cultivation and the marketability and the exportability of the crop grown. In this light, the research identified two profit-making scenarios for gardeners in Accra: a situation of relatively high, but unreliable profit margin which is associated with the cultivation of less secure land such as squatter land, and; two, a situation of relatively low, but reliable profit margin which is associated with the cultivation of more secure land such as utility and rented lands.

In spite of the growing importance of cultivation in the household and urban economy of Accra, the research reveals that the sector is undergoing stress which emanates from the failure of the urban institutions to officially recognize the sector and provide enabling environment for its growth and development. Urban cultivators in Accra are confronted with a number of problems which centered around, in order of priority, poor access to urban land for farming, lack of capital, high cost of agro-chemicals, theft and vandalism, lack of improved seeds/seedlings, lack of irrigation water, limited market and poor access to urban compost. It is a conclusion of the research that the degree to which some of these problems are real concerns to the urban gardeners depends on the gender and income level of the gardeners as well as the type of land tenure and the location of gardens.

Based on the review of the 1995 AMA's bye-laws, the research finds that metropolitan legislation tends to deter or limit urban cultivation in Accra, and this is reflected in urban gardeners' description of the official position on urban agriculture as discouraging. Most of
these gardeners are outer city gardeners, squatter gardeners and low-income gardeners who tend to cultivate less secure lands, and hence are often the target of official harassment and intimidation. The reason underlying such non-supportive official response towards urban cultivation stems from the perception of officials of the Public Health Department and Accra Metropolitan Authority that cultivation of food in the city is susceptible to contamination from vehicular emissions, the use of drain water and indiscriminate use of urban compost - which posed serious public health risks. They supported their argument with a laboratory examination which indicates high concentration of trace metals on leaves of crops grown along high traffic routes, a microbiological investigation of some drainage water used in urban gardening which indicates high incidence of fecal pollution which exceeds WHO limits, a study of trace metal concentration in urban compost which reveals a high concentration of Pb, Zn, and Fe, and also a physio-chemical examination of major rivers which revealed high levels of BOD, NH₃-N, NO₃-N, PO₄-P and pH emanating partly from the urban agricultural wastes which reduce the quality of drinking water.

However, a trace metal concentration of some sites in some parts of Accra reveals that the accumulation of trace metals in edible flora has not occurred in the extent which might be harmful to humans. These are areas with low traffic volumes and industrial activities. Also, the research alluded to a study by Furedy and Chowdhury who argued that actual public health risk is lower for the urban poor or low-income earners as they are exposed to multiple sources of infections and with time they become less susceptible to infections associated with reusing organic wastes for food production. Finally, the research finds that although the 1995 Accra Metropolitan Authority bye-law technically restricts the activities of urban cultivation in Accra, a prior enactment in the 1989 by the Accra Metropolitan Assembly provided a legislative support to urban cultivation by recognizing the activity and urging land use and policy to protect and monitor the sector. Thus, at the level of legislation, the official response has been
encouraging, but at the level of plan implementation, the official response can be described as
discouraging.

Bringing the three reviewed development theories - Modernization, Marxist and
Dependency theories - to bear on the research findings, some relevant comments can be
made. The findings of this research that urban gardeners are not recent immigrants but a long-
time residents of Accra have challenged the philosophical notion by the Modernization school
that urban agriculture is predominately practiced by recent migrants who lack integration into
the urban economy and culture. The survey disputed this claim and reveals that most
cultivators have lived in Accra for more than 20 years, achieved an average level of education
and are from diverse income and occupation groups. This outcome provides an indication that
gardeners in Accra have already been well-integrated into the sophisticated social fabric of the
urban life. The modernization school expressed a parochial view about what constitutes
progress and prosperity when they perceived western-based style of industrial cities as an
indication of economic prosperity. In the minds of the modernization, they seem to suggest that
the measure of prosperity is related to provision of high-tech infrastructure services,
sophisticated building structures, and the commercialization and industrialization of cities. What
they failed to appreciate is that progress and prosperity are related to humans and not physical
structures. Hence, so far as urban agriculture provides urban residents in Accra with source of
food, means of income and employment - all which go to enhance the economic and personal
development of themselves and their households while providing for them a green, liveable
environment (by absorbing urban wastes) for their healthy development - one can describe the
activity as progressive and prosperous. If the basic essence of western-based system of
modernity is economic prosperity, then urban agriculture in Accra is a modernized activity as it
has more than achieved that goal. Furthermore, contrary to the view of the Modernization that
urban cultivation should be blamed for the degradation of the quality of the urban life, it is the
research findings that not only does urban agriculture enhance the economic livelihood of cultivators, but it promotes the integrity of the urban environment and human health by reducing and recycling urban wastes, managing urban floods, conserving energy and reducing pollution. The study has demonstrated that the modernization indoctrination which has influenced urban planning in Accra needs to be replaced with a more practical and progressive initiative which places the interest of the people at the center of development.

In response to the Marxist interpretation of urban agriculture, it is important to note that urban cultivation was not born out of the need to revitalise and reinforce global capitalism. Household food production in Accra was in existence long before the economy was integrated into global capitalism, although one has to admit that the interest in urban cultivation grew tremendously after the implementation of the SAP. However, it is important to bear in mind that it is not global capitalism which directly created urban cultivation, but it is people who undertook urban cultivation as a response to the failure of the formal urban economy to generate jobs for which the SAP could partly be blamed for. Even, the benefit of urban cultivation have led to some urban residents to leave the formal sector employment to engage in full-time urban cultivation. Thus, it is not always the case that, in a desperation for job, some urban residents are compelled to undertake urban cultivation as the Marxists would like us to believe, rather the decision to engage in urban farming is born out of a choice on the part of these gardeners to eke a living out of their natural environment. Furthermore, the findings jettison the Marxist perception that urban cultivation will increase labor's vulnerability within predominately exchange economies. The research reveals that household cultivation of food in Accra has rather insulated some households from the market, and reduced their exposure to market distortions as gardeners do not have to depend on the market for their food supply. The ability of urban agriculture in Accra to create jobs in other sectors of the urban economy through its forward and backward linkages with these sectors has provided the reason to
question the Dependency view that the informal sector cannot improve the living standards of its operators because linkages between the formal and informal sector are characterized by a dependent relationship. In a real sense, in Accra, one can suggest that the formal sector is increasingly becoming dependent on urban cultivation in the form of supplies of food to feed households of civil servants, goods for commercial houses and raw materials for agro-processing industries. Finally, the Dependency perspective’s view that the informal sector has less capacity for growth and are just transitory or temporary activity has also been refuted by the findings which suggest that urban cultivation in Accra is a long-term permanent initiative on the part of the urban poor to improve their standard of living. Thus, one of the theoretical lessons of this study is that, urban agriculture in Accra is not a stop-gap measure but a permanent venture on the part of some urban residents to eke a living out of their natural surrounding.

8.3 Policy Recommendations and Conclusion

For farming to become a sustainable tool in the AMA, strategic policies need to be formulated to reverse the unfavorable attitude towards urban cultivation in the metropolis. Such policies should be sensitive to the challenges, concerns, and issues arising out of cultivation in the metropolis. The overall objectives should be to change the way policy makers, urban planners, the metropolitan authority, and financial institutions perceive urban agriculture, and to create an enabling environment which allows the sector to thrive and explore its full potential. The goals should be to remove the constraints facing current urban gardeners, to make potential gardeners as well as the various urban institutions aware of the benefits and possibilities of urban farming in Accra, and to move the sector towards capturing its multiple benefits for the poor, the ecology and urban management. These objectives could be achieved through land management reform, enabling legislation and institutional support, and through
an integrated effort on the parts of farmers, community organization, agri-business and the metropolitan authority.

The AMA should officially recognize urban agriculture as land use activity in Accra by allocating or zoning land purposely for farming. An elaborate green belt system should be demarcated in the land use plan with legislative support to protect it from future encroachment by physical development. Enforcement and monitoring of the green belt zone is strictly required in light of the fact that green areas are easily encroached in Accra. Such green space could also be used for urban cultivation. However, intensive cultivation in the green belt should be monitored to avoid possible damage to the environment. This could be achieved through a green-belt management contract between the gardeners and the AMA officials which rewards gardeners who protect and manage the ecological functions of the green space, and penalize those who do not.

Furthermore, land presently underdeveloped and likely to remain undeveloped for sometime could be earmarked for urban cultivation. Three levels of temporary use of undeveloped land for urban farming could be made possible. At the first level, land which is likely to remain undeveloped for at least the next 20 years could be earmarked for a long-term urban cultivation. Lands which mostly fall under this category are institutional lands belonging to schools, community centers, hospitals and churches. These institutions need to be encouraged, through a “land sponsorship” program, to make available for urban cultivation unused lands either by encouraging its members to participate directly or loaning such land to individuals or community groups.

At the second level, lands guaranteed to remain unused for a period ranging between 5 to 15 years could be used for a medium-term urban cultivation. These should be mostly speculative lands, and urban gardeners should be assisted by the planning department to enter into a formal agreement with the land owners to cultivate and maintain these lands for
the period for which they remain undeveloped. Finally, urban land likely to remain undeveloped for up to the next 5 years could be utilized for short-term cultivation, and gardeners should be made aware to orient their production practices to reflect this period. Strategic gardening should also be encouraged on abandoned derelict lands, and lands likely to be susceptible to criminal activities and reptile habitat should be assigned for urban cultivation. Urban cultivation should not be permitted in areas where it is likely the urban hydrological system will adversely affected, especially wet lands. In addition, cultivation should not be allowed close to river banks or flooded areas of rivers and streams, where it is likely it could cause pollution or distort the flow of water. Even where urban cultivation is practiced some distance away from a river bank, it is relevant to monitor the activity so as not to pose danger to the urban hydrological system in the form of distorting the flow of drainage and polluting drinking water.

The planning department of the AMA should also foster mixed land use, as many existing spaces in the metropolis are inefficiently utilized and could easily be combined with farming to increase their economic efficiency and productivity. Such opportunities exist for land in the areas of military installations, airports, industries, churches and government-agency headquarters. This also requires that the AMA should encourage housing designs which provide productive space around newly built residences. Although high income residential areas, which are zoned for low density planning, have spacious land surrounding their buildings, most of the residents are not interested in backyard gardening. In contrast, the urban poor who have the tendency to cultivate space around their buildings or in their neighborhood reside in high density communities where the plot layouts or the housing designs do not leave much room for backyard space and gardening. This incompatibility should be addressed with a new residential planning which incorporates land use needs and community density with socio-economic needs. Thus, there is a need for what can be called “agro-residential planning” which allows for space around residential building to be used for
gardening. Thus, building regulations should encourage developers to assign portion of the area to be developed for residential building to green space or landscape development.

To enhance the marketing of garden produce, the Greater Accra Vegetable Growers Association should undertake a coordinated initiative to expand and strengthen the role of direct marketing, create urban agricultural marketing services, and establish a centralized farmers' market in the inner city where fresh or organic food from local gardens could be sold directly to urban consumers. Since the city is the place where most consumers are located, it is appropriate to establish such a market to facilitate direct contact between producers and consumers. Farmers' markets have proven to be a popular and effective food delivery system, as they supply consumers with direct access to high quality, fresh produce at affordable prices while providing a marketing opportunity for small scale vegetable growers. As many urban consumers become increasingly ignorant of the source of their food, farmers' markets personalize the food system, lending face-to-face connection between farmer and consumer as to the problems, concerns and issues arising out of urban cultivation. Additionally, a marketing organization should be created to directly link gardeners with various institutional consumers to facilitate, expand and strengthen the role of direct marketing to such institutions such as schools, hospitals, military barracks and government departments. Such a link should also be extended to grocery stores and agro-processing companies by encouraging them to purchase locally grown food crops.

To minimize food contamination associated with urban cultivation in Accra, green leafy vegetables such as lettuce, cabbage and spinach, which are the most vulnerable to trace metal pollution, should not be grown along transportation corridors, while root crops and fruit trees, which are most resistant to trace metal pollution, should instead be grown. This is because research by Gassert (1987) reveals that that lead uptake, from soil or air, is highest in leaf vegetables, medium in root crops and lowest in fruits. The UNDP (1996) recommends
that green leafy vegetables should be planted at a minimum distance of 7.5 meters from roads where leaded gasoline is used. Maize is a good example of a plant that can be grown by roadsides because its own leaves protect the cobs from lead in the air. In addition, planting more resistant crops such as fruits or cassava by the roadside can act as a hedge to protect the more vulnerable crops from exhaust fumes. Also, lead should be removed from the surface of vegetables, fruits or root crops by washing them with water or diluted vinegar, or by peeling before consumption. Furthermore, soil toxicity tests should be conducted on industrial sites (to identify concentrations of heavy metals such as iron) to assess the health risk of using the land for food cultivation.

On the financial front, urban gardeners should be assisted to form cooperative ventures to pool resources together and qualify for bank loans to finance their operations. Such credit is needed by commercial growers to finance the purchase of intensive technologies and other farm inputs such as improved seedlings, irrigation equipment, organic compost and refrigerators, and to construct market stalls in high income neighborhoods. Such co-operative ventures will likely enable gardeners to reap the benefits of economies of scale, sharing information, and promoting participatory problem solving. It is important to note that official recognition of urban agriculture, and its integration into the metropolitan planning process, could facilitate the acquisition of bank loans or government grants by most urban gardeners. For example, in 1988, urban gardeners did not benefit from the loan portfolio of the Agricultural Development Bank of 132.3 million cedis to the various agricultural sub-sectors. This is because they were not officially recognized as farmers. According to the UNDP (1996), lending to urban farmers may have lower risk than lending to rural farmers since urban cultivation takes place closer to the market and the technologies used in urban cultivation may be less dependent on the climate.

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2 Personal communication with Ms. Grace Andah, Accra District Extension Officer.
A national urban agricultural program should be established by the national government through a legislative instrument. This program should establish and monitor a policy framework that seeks to develop, maintain and support small-scale intensive gardening in Ghanaian cities. To complement the national effort, metropolitan authorities should adopt a more regulatory framework instead of a prohibitive approach towards urban cultivation. Thus, instead of banning the activity in some areas for reasons of health and sanitation concerns, metropolitan authorities should rather put in place regulations on how the activity should be done without posing danger to public health and institute a monitoring mechanism to ensure compliance to the regulation of operation. This is because uncontrolled urban cultivation is likely to continue even in the face of prohibitive measures, thus leaving regulatory or accommodative measures as the only option to manage this phenomenon. Thus, statutory powers and legal framework should be used to assist, advise and guide agriculture in Accra. Importantly, a concerted effort should be made to streamline and harmonize all metropolitan and regional regulations regarding urban cultivation to avoid inconsistency or contradiction. A public information campaign should be encouraged to promote the interest of cultivation within the urban community. Such propaganda could use the media (radio, newsletter, video, monographs, training curriculum and conferences) to disseminate to the public the benefits of urban cultivation.

Also to encourage urban cultivation, an integrated institutional approach towards problem solving and resource management should be adopted. This requires some form of collaboration from major regional and local departments whose activities impact on urban cultivation one way or the other, such as the Council for Scientific and Industrial Research, the Environmental Protection Council, the Ministry of Food and Agriculture, the Stool Chiefs, the Department of Health, Works and Sanitation, the Department of Housing, the Department of Parks and Gardens, the Waste Management Department and the Accra Metropolitan
Authority. They should endeavor to establish clear policies regarding the operation of urban gardens and provide long-term monitoring of cultivation in the metropolis. Another aspect of integration is in the area of resource management. As a result of the Accra Beautification Program, urban forestry and tree planting have remained one of the top priorities of the AMA. Hence to facilitate official support to urban cultivation, it is strategic to link urban farming with urban forestry in Accra. In Accra, there is a real lack of concrete initiatives that link urban farming and urban forestry; however, it is essential to grow trees and crops on the same land as they complement each other and foster better environmental conditions. The expansion of Accra Beautification Program has led to more urban space allocated for tree planting, and urban cultivation stands to benefit under this program if linked with urban forestry. Furthermore, one will like to suggest that the promotion of urban agriculture in Accra should go hand-in-hand with other initiatives to provide clean water, improved health, and better education to the people. In addition, effort should be made to ensure that the promotion of urban cultivation is not to the detriment of rural food production, especially in the areas of input supply, food pricing, and extension services. This therefore calls for an integrated initiative to promote urban and rural food production in areas of problem identification, budgetary allocation, technical support, input supply, marketing information and entrepreneurial development.

Since 1987, the Water Resources Research Institute (WRRI) of the Council for Scientific and Industrial Research (CSIR) has began a project on "Groundwater Utilization in the Accra Plains". The objective of the project was to test the possibility of obtaining sufficient groundwater in and around existing settlements for small-scale irrigation and livestock rearing in Accra. So far the results are positive and these have led to progressive vegetable gardening activities at Kponkpo and Ablekuma. The study reveals that aquifers, limited in areal extent, occur both in the overburden and in fractured bedrock in Accra. Although bore hole yields in
the metropolis area are low, ranging from 10 to 100 liters per minute (2-20 gallons/minute) with an average of about 60 liters per minute (15 gallons/minute), the WRRI reported a number of wells that could provide adequate water to irrigate vegetable crops in the central and outskirts of Accra. Considering the extensively fractured and jointed nature of the sandstones that underlie a major portion of the metropolis, one cannot but expect that a higher groundwater potential in Accra could be developed for watering gardens instead of the use of unwholesome water from drains and ditches. However, efforts should be made to prevent contamination of aquifer drinking water. Intensification of agriculture, often by means of irrigation, can produce groundwater quality problems, particularly with respect to nitrate, salinity and pesticides (Chilton et al, 1995). Studies by Yagodin (1984) have shown that plants take up an average of 40% nitrogen fertilizer applications. Part of the remaining 60% may be used up by weeds or either washed by surface runoff into streams or leached into groundwater systems. It is not easy to state the extent to which such chemical leachates are already affecting groundwater resources in Accra given the absence of any systematic monitoring. Steps should be taken to ensure regular monitoring of sewage and industrial and agricultural discharges in recharge areas of aquifers to ensure that these meet the required standards.

This thesis has identified urban compost as an important input in gardening in Accra. It is therefore important that its use be encouraged. To achieve this, cost of compost (purchase, delivery and application) should be kept as low as possible to make it competitive with other methods of soil improvement. Since delivery cost constitutes the major cost component of urban composting, compost plants should to be located as near as possible to the urban gardens. To widen the catchment area of waste collection, it is important to improve facilities for collection, transportation and delivery of wastes. The costs of collection and transportation could be charged to the community and municipality rather than being borne by the compost plant. Also part of the processing cost could be chargeable to the municipality as a direct
waste disposal cost. The effective delivery of compost at low cost will require some form of
 collaboration between the private sector and the municipal authority.

Government support for urban agriculture in the form of research needs to be intensified. In 1992, a workshop was organized by the Overseas Development Administration (ODA), Natural Resources Systems Program (NRSP), Crop Protection Program (CPP) and Crop Post-Harvest Program (CPH) in Kumasi to brief local stakeholders and potential local research collaborators on the ODA’s research agenda on peri-urban studies in the country. The objectives of the workshop were to prioritize the main research themes which should be investigated in Ghana, to develop contacts with local research teams and other local stakeholders with whom RNRRS project managers (and any required external research organizations) might collaborate in carrying out the research, and to collect information on which to base briefing materials for possible external researchers and potential research collaborators. Specific topics prioritized by participants for research in Ghana, and which are relevant to urban agriculture, include the use and promotion of organic manure in restoring and maintaining soil’s physical and chemical properties for vegetable production; the effects of agro-chemical application on vegetable growing on water bodies in peri-urban areas; the breeding, selection, production and processing of vegetable seeds; adaptive agronomic technology for peri-urban farming; the development of appropriate technologies for post-production and post-harvest handling of vegetable crops; the distribution and marketing of vegetable crops; and the management of valley bottom water resources for vegetable production.

Overall, there is the need to integrate urban agriculture into the metropolitan planning process in Accra. This entails identifying and prioritizing the needs of gardeners through grass roots consultation and field research, reviewing existing bye-laws to ensure that they are accommodative to urban cultivation, linking infrastructure services to the promotion of urban
farming, and providing technical information to existing utility corridor plans and maps to explore the compatibility of their use for food cultivation. Specifically, metropolitan planning should provide the physical context in which urban cultivation could be pursued aggressively and provide the enabling environment for gardeners to better their economic lives.

8.4 **Strengths, Limitations and Future Agenda of Research**

The strengths of this research, and its contribution to scholarship, lie in three main areas. First, it has contributed to policy by providing sufficient evidence to support the position that urban agriculture is a viable sustainable initiative as it enhances the economic base of gardeners (by generating income and providing food), promotes the ecological integrity of the urban environment (by providing the means of recycling organic wastes and abating mild flooding), and uplifting the social life of the people (by providing them with the means of self-reliance and self-control). This therefore provides the basis for which metropolitan planners, national policy makers and international institutions should support urban cultivation in the areas of planning, legislation and policy.

Secondly, the research constitutes a pioneer study in the historical development of urban cultivation from pre-colonial to the contemporary era. Thus, it brought history to bear on the growth of farming in an African city by providing a complete account of the events and actions that have shaped the evolution of agriculture in Accra. Most contemporary research on urban cultivation has simply documented and described phenomena associated with urban agriculture and has failed to provide analysis of historical events and actions linked to the growth and development of the sector. Thus, they tend to be superficial and unable to instruct readers on past, present and future events that relate to urban farming.

Finally, this research has injected some spatial parameters into the intellectual debates on the role, benefit, characteristics and the problem of urban farming. Unlike most existing
literature, the research avoided a blanket generalization and conclusions by assessing the spatial relevancy of most of these arguments and conclusions. It achieved this purpose by examining how the spatial variation of land values and land tenure arrangements have shaped the operation and management of farming in Accra in terms of why to produce, what to produce, where to produce, how to produce, when to produce and who to produce. In short, by exploring the historical development and the spatial dimension of urban cultivation in Accra, the research has contributed to intellectual inquiry by bringing to bear on urban farming - in the context of urban sustainability - the issues of space and time.

However, a number of issues emerged in the course of interviews which have implications for the interpretation of data collected. First, additional members of some households participated in the interview in the form of providing answers to the person actually being interviewed. In some ways, this assisted the interviewee to recollect certain facts which eluded him or her due to a memory lapse. In other cases, this created some confusion as their responses contradicted the original answer given by the interviewee compelling the interviewee not to be sure of his previously given response.

Another related issue pertained to who was to be interviewed when the actual person engaged in farming was not the head of the household. It is the objective of the research to interview the person who was actually involved in the farming activities. But in some households misunderstanding arose when this objective was pursued. This was because the heads of the household, who were predominately males, felt that they are obliged by their societal norms to be the spokesperson for the household, hence, they should be interviewed and not any member of the household who happened to be the gardener. To resolve this problem, the interviewer resorted to interviewing both the head of household and the person actually engaged in the farming activity at the same time, however efforts were made to ensure that they do not provide conflicting answers to the questions posed.
Furthermore, some households were initially reluctant to respond to some questions. For instance, some felt information on their income might be used by the government to impose a tax on them. Others were not comfortable in providing information to someone who was not a member of their tribe. They felt some information was very personal and could only be divulged to their kinsmen.

Another problematic area of concern relates to measurement. Some of the respondents provided visual estimates of the dimension of their garden plot. This came about because of the lack of numeracy on the part of these respondents. These estimates were double checked by the interviewer with a tape measure, however this offended some respondents who claimed the interviewer did not trust the information they had given, hence affected their initial collaboration.

Furthermore, most of the respondents were able to provide information on their monthly food expenditure, few had a problem with the computation. This problem was resolved by requesting them to provide estimates of a typical daily expenses incurred on food which they easily estimated. The estimated figure was multiplied by 30 days to arrive at a monthly food expenditure for the household. Furthermore, due to financial constraints, the researcher could not include in his analysis the role of livestock and poultry keeping in household economy of Accra. Although the research made some references to the role of poultry keeping in the development of urban gardening in Accra in respect of providing organic manure for soil and land improvement, a consideration of urban animal husbandry in the overall objective of the research, could have provided a comprehensive critical insights into the general role of urban agriculture in the household and urban economy of Accra. In spite of the above limitations the overall validity of the findings and conclusions was, however, not affected. The above limitations could be dealt with in a future research agenda.
To advance this research, the author suggests three related research agendas for the future. First, research should be directed to exploring how urban animal husbandry and urban cultivation complement each other, and what planning and policy initiatives should be pursued at the local level to advance the integration of these two related sectors. This research option is crucial in understanding, comprehensively, the broad issue of urban agriculture. Such research should also focus on exploring rural-urban relationships, how these relationships impact on urban cultivation as well as how to integrate rural and urban farming by means of technological transfer, information exchange, input and policy support and problem solving. Secondly, future research should also address the issue of equity in urban agriculture. Analysis should be carried out on who will benefit from future expansion and improvement of urban agriculture especially with regard to gender, income and ethnic inequalities. The research should aim at devising strategies that ensure that institutional and government support to urban agricultural sector bridge the inequalities gap among all groups of gardeners. Also, research should be directed towards providing a framework for government support at the level of community, metropolitan, regional, national and international level. Thus, it should explore who does what, and at what level of government. This should also focus on identifying institutions that could be interested in urban agriculture, and the potential for institutional partnership whether government, non-governmental or private. Finally, there is also the need for developing some accounting system for analyzing the cost-benefit ratio of using urban land for agriculture which includes social, health and economic aspects. This research focused on profitability assessment of urban cultivation which only considered economic values in the calculation.

3 In Ghana, 4,440,000 livestock are kept in all urban areas. This include 10,000 draught animals, 110,000 cattle, 340,000 sheep, 470,000 goats, 30,000 pigs, and 3,480,000 poultry.
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APPENDIX A

RESEARCH QUESTIONNAIRE

SECTION A: Household Characteristics

1. ID #: ................

2. Sex of the main cultivator?
   [1] male
   [2] female

3. What is your highest level of formal education?
   [1] none
   [2] primary
   [4] university
   [5] other (specify) ............

4. How long have you lived in Accra? ....................

5. How long have you been involved in urban cultivation? ....................

6. What is the size of your present household? ............

7. What is your occupational background? ............

8. Besides farming are you engaged in any other job(s)?
   [1] yes
   [2] no
   If "Yes" what other job(s) are you engaged in? ............

9. What is your estimated total monthly income? .......... cedis

10. What percentage of your total monthly income comes from farming?
    [1] Over 95%
    [2] 75% - 90%
    [3] 30% - 50%
    [4] 10% - 25%
    [5] 0%
SECTION B: Farming Characteristics

11. What is/are the main crop(s) grown on your farm(s)?

12. What factor(s) influenced your choice of a particular crop to grow?

13. What is your primary reason for farming?

   [1] for food
   [2] for income
   [3] to supplement income
   [4] to save money for other purposes
   [5] recreational purpose
   [6] to hold on land
   [7] neighbourhood safety
   [8] other (specify) ...........

14. Where is your farm located?

   [1] in the inner city
   [2] outside the city

15. Which part of the city do you reside?

   [1] in the inner city
   [2] outside the city

16. What is the size of the land you cultivate?

17. How did you gain access to the use of your garden plot?

   [1] owned by family
   [2] stool land
   [3] renting/leasing
   [4] public land
   [5] squatter settlement
   [6] custodian arrangement
   [7] other (specify) ............
18. What is your main source of farm labour?
   [1] self
   [2] family
   [3] hiring
   [4] friends
   [5] others (specify)..........

19. Do you think in the nearest future you will like to increase the size of your farm?
   [1] yes
   [2] no
   [3] don't know

SECTION C: Role of Urban Farming

20. What percentage of your total monthly income do you usually spend on food?

21. How much food grown on your farm is consumed by your household?
   [1] all (100%) 
   [2] much (60-95%)  
   [3] some (25-55%)  
   [4] little (10-25%) 
   [5] not at all (0%) 

22. Would you have been able to meet your household food requirement or other needs without engaging in farming?
   [1] yes
   [2] no
   [3] don't know

23. If you should save money due to your household dependence on your garden produce how are you likely going to spend these savings? (rank in the order of priority.)
   [1] to pay rent ........
   [2] for transport cost ........
   [3] to buy clothing ........
   [4] for recreation/entertainment ........
   [5] for health cost ........
   [6] bank saving ........
   [7] other (specify).............
24. What is/are the source(s) of the following farm inputs used on your farm?

- [1] seeds
- [2] storage
- [3] implements
- [4] pesticides
- [5] water supply
- [6] finance
- [7] manure/fertiliser
- [8] managerial skills
- [9] transport

25. If you are involved in commercial farming, who are your main customer(s)?

(specify all those that apply)

- [1] direct market sales
- [2] hawkers/food sellers
- [3] export market
- [4] agro-processing company
- [5] restaurants
- [6] public institution
- [7] others (specify)

SECTION D: Problems and Promotion of Urban Farming

26. Do you wish you were able to cultivate more land for food than you are doing now?

- [1] yes
- [2] no
- [3] don't know

Explain your response.

27. Have you ever experienced any problem in the use of your garden plots?

- [1] Yes
- [2] No
If your answer is “Yes”, please briefly describe the problem(s)
.....................................................................................................................
..........................................................................................................................
.....................................................................................................................
...........................................................................................................................

28. What activities or land uses are competing for the land you are cultivating?

[1] residential development
[2] industrial establishment
[3] infrastructural development
[4] institutional establishment
[5] recreational facilities
[6] none
[7] other (specify).............

29. How do you respond to increase pressure you might have experienced in the use of your garden plots?
.....................................................................................................................
..........................................................................................................................
.....................................................................................................................
...........................................................................................................................

30. If ever approached, are you willing to sell your land for other uses other than farming?

[1] yes
[2] no
[3] don’t know

31. How far in the future do you hope to continue with your cultivation?
..............................................................................................

32. From the most to the least, list the input constraints hampering the success of your farming activity.
.....................................................................................................................
..........................................................................................................................
.....................................................................................................................
...........................................................................................................................

33. How will you describe local government policy towards farming in your area?

[1] highly encouraging
[2] somewhat discouraging
[3] highly discouraging
[4] somewhat encouraging
[5] not sure
APPENDIX B

MEMORANDUM ON WAYSIDE GARDENING

During the period 1972-79 when Ghanaians were encouraged to undertake backyard gardening to improve upon the food situation, an offshoot of this was the use of the shoulder of drains on streets for growing of vegetables, like cabbages, onions, salad leaves, etc.

These gardens can be found along the entire length of the Ringroad and some of the major and strategic roads. For the watering of these gardens, the drains are dammed for the collection of drainwater and the sides of the drains are holed for providing foothold for going into and coming out of the drains.

The Accra City Council (Growing and sale of crops) Bye-Laws 1976 clearly disallow and attempts to discourage the practice by the appointment of the Medical Officer of Health as the regulating officer.

These gardeners, by their preparation of the land for planting disturb the vegetative cover, causing the breaking of the soil, exposing it to both wind and water erosion, sending them into the drains causing siltation and resulting in the growing of weeds and sometimes trees in the drains as can be seen near the Police Headquarters.

Besides, the silted drains become fertile breeding grounds for mosquitoes, the damming of the drains compounds this problem further aggravating the insanitary condition.

Finally, making holes in the lining of the drains, the structures are weakened, which progressively results in the destruction of the drains.

Quite apart from the health hazards, the Waste Management Department is unduly burdened with the cleaning of these drains. In some cases expensive excavators have to be used to make these drains free flowing again.

The Waste Management Department calls upon the Sub-Committee to recommend the stoppage of wayside gardening for the approval of the Accra Metropolitan Assembly in all cases that the gardens are operated right from the edge of the drain and affluent from the drains/street is the only source of water for watering.

Sgd. N.A. Armah
CHIEF MECHANICAL ENGINEER
22 May, 1989
APPENDIX C

LETTER REQUESTING PLOT OF LAND TO RESETTLE
WAYSIDE VEGETABLE FARMERS

Ref. 0522/SF.2/699

ADMINISTRATION DEP'T,
F.O. BOX 385,
ACCRA, GHANA


REQUEST FOR A PLOT TO RESETTLE WAYSIDE
VEGETABLE FARMERS IN THE ACCRA
METROPOLITAN AREA

For sometime now the A.M.A. has been concerned over the farming activities of wayside vegetable farmers operating in the Accra Metropolitan Area.

In order to avoid any future outbreak of typhoid and curb the breeding of mosquitoes, the Environmental Health and Sanitation Sub-Committee of the A.M.A. has decided that wayside farmers should be resettled in an orderly fashion that would enable them to carry out their farming activities in a more scientific and hygienic manner.

The A.M.A. is therefore, requesting for a plot of land near the Weija Irrigation Authority's farm to resettle the displaced farmers.

We would therefore be grateful if you would accede to our request.

for: DIRECTOR OF ADMINISTRATION

K.E. DENNIS

THE CHIEF EXECUTIVE
IRRIGATION DEVELOPMENT AUTHORITY
ACCRA.
APPENDIX D

WEJJA IRRIGATION COMPANY LTD.

P.O. BOX M.154
ACCRA-GHANA

22nd October, 1990.

RE: REQUEST FOR A PLOT TO SETTLE WAYSIDE
VEGETABLE FARMERS IN THE ACCRA METROPOLITAN
AREA

I refer to your letter ref. No. 0522/6/2/699 of 26th September, 1990 addressed to the Chief Executive, Irrigation Development Authority (IDA) and the subsequent reaction from I.D.A. - their reference ID/WIP/03SA/30 of 11th October, 1990.

There is a land available on the project to resettle the Wayside Vegetable Farmers currently operating in Accra.

I have attached document which explain the procedures for acquiring land on the project.

We expect the farmers concerned to apply formally for the land.

Please contact us at our offices located on the project site at Tabakrom for further discussions.

Sgd. AG. MANAGING DIRECTOR

B.C. ATTIFOE