

RUAF

RESOURCE CENTRES ON URBAN AGRICULTURE & food SECURITY



**A Narrative
On**

**Urban Agriculture
in Accra Metropolis**

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Summary

This paper synthesises the results of an exploratory study on urban agriculture (UA) in Accra. The study which was carried out through participatory multi-stakeholder process focused on rapid assessment of forms of UA and functions provided by open spaces as well as the analysis of key stakeholders and relevant municipal policies on UA. Study approach included literature reviews, key informant interviews, focused group discussions and use of semi-structured questionnaires for individual interview. There are diversities in agricultural practices in the city; UA production systems include poultry, ruminants, irrigated vegetable, mushroom, floriculture, domesticated wildlife, medicinal plants and seasonal crop production. The dominant UA are irrigated, market-oriented, vegetable production with an average farm size of 0.02 ha. UA contributes up to 80 % to the supply of fresh exotic vegetables to Accra. In addition irrigated vegetable farming supports about 1000 farmers' livelihood as it could yield on the average, a monthly income which is well above the per capital General Net Income of US\$ 27/month in Ghana. Moreover, emerging non-traditional production systems such as mushroom cultivation, domestication of grasscutter and dairy farming were reported to be lucrative ventures for the producers. There are different actors at various levels in the UA sector but there is no formal relation or consultation among them as each actor limits its action to aspects that relate to its activity. So far no coordinating structure has been set up to organize the sector. This lack of coordinating structure tends to limit the potential impact of the UA sector. There are no specific policies on UA, neither is it integrated prominently in the general micro-economic level development policies. To maximize the benefits and ensure sustainability of UA in Accra, there is need to institutionalize UA by integrating it into overall urban development plan. Achieving this will involve the formulation of appropriate UA policy and development of strategic action plans with the full involvement of all relevant stakeholders.

1. Introduction

About 44% of Ghana's 20 million population currently live in urban areas, with some cities having growth rates as high as 4.4 % (GSS, 2002). Moreover, the migration of people from rural areas to the cities in search of 'greener pastures' has increased urban food demands as well as the number of urban poor who cannot afford basic amenities of life. Accra, the capital and largest city of Ghana covers an area of about 170 km² (17,362 ha). The overall annual average income of Accra is \$915.09 as compared to Ghana's GDP of \$350 and about 12.2% of the population is unemployed (AMA, 2000). Increasing number of the population and involved in different kinds of informal income-generating activities. Among these is agriculture within and around the city, taking advantage of backyards, open spaces, urban runoff, inadequate food storage and processing facilities as well as urban market proximity. According to Mougeot (2000), urban agriculture is an enterprise located within or on the fringe of a town, a city or a metropolis, which grows or raises, processes and distributes a diversity of food and non-food products, (re-) using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services largely to that urban area. Urban Agriculture is dynamic and exists under scarce as well as abundant land and/or water resource

situations and under a range of policy environments that can be prohibitive or supportive to its existence and development (de Zeeuw, 2004).

Within the *Cities Farming for the Future (CFF)* program of the international network of Resource Centres on Urban Agriculture and food security (RUAF), it was necessary to analyze the situation of UA in Accra towards the identification of social, economic and policy issues that need to be addressed for the integration of UA into the development agenda of the city authorities. Hence participatory exploratory study was carried out by a multi-stakeholder group. The specific objectives were to: characterise urban farming systems within the geographical boundary of Accra Metropolitan Assembly (AMA); map out the various land use pattern and identify the functions provided by open spaces; analyse the main stakeholders involved in urban agriculture and review relevant policies and byelaws relating to the practice of urban agriculture in Accra. The Study involved review of project documents from various institutions, as well as policy documents from Government departments. Furthermore, selected farmers were interviewed on one to one basis using structured and semi-structured questionnaire. Focus group discussions were held with two farmer associations for further data verification. The type of activity on each vacant space was characterised and mapped. Various stakeholders were identified and assessed with regards to actual and potential role in the development of UA in Accra.

2. Land use pattern and urban agricultural systems in Accra Metropolis

Vacant land spaces in Accra are of different types. These are mainly: Institutional/public (such as schools, defence, and aviation); privately owned land; greenbelt (forest, protected areas); mixed use (residential, commercial etc) and residential areas (Fig 1)

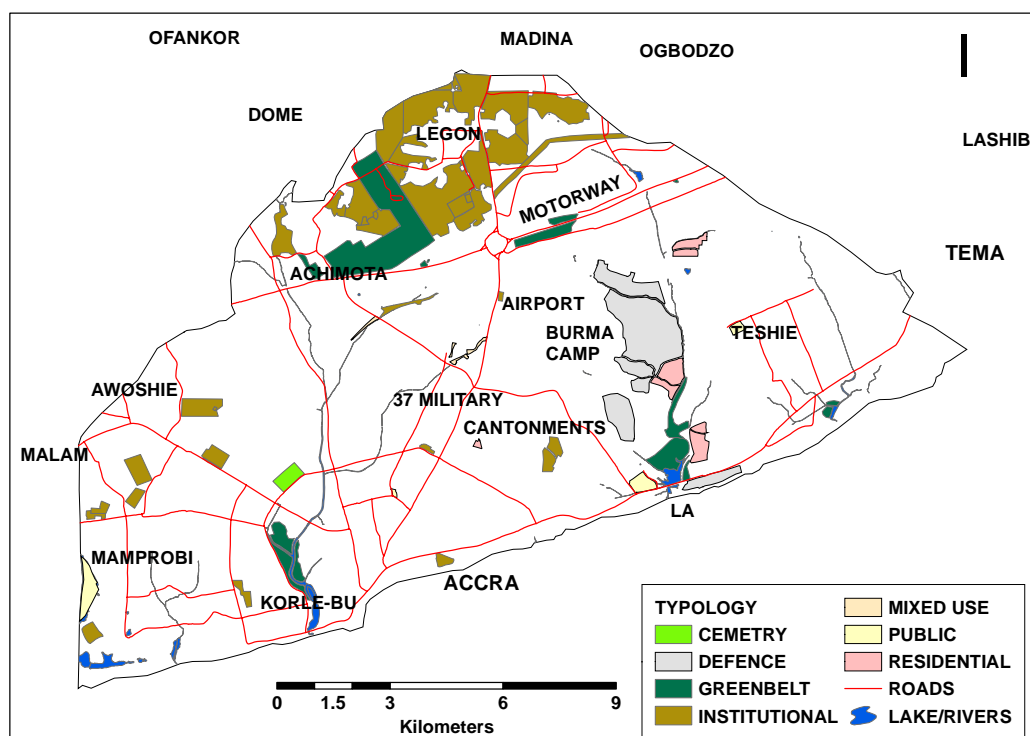


Fig. 1. Typology of open spaces in Accra Metropolis

Most of the cultivated lands are owned by various institutions as there are no clearly defined areas for urban agriculture. This challenges the sustainability of UA. Policy makers/planners should consider the possibility of providing lands in peri-urban areas for agricultural purposes. On the other hand, it would be useful if these institutions accept and promotes UA as a major economic activity in the city. Non- traditional UA (such as mushroom, grasscutter) is carried out on relatively small plots within residential and privately owned lands it is quite suitable where land is not available for extensive production.

Basically, the various forms of UA in Accra include: crop production system, non-crop systems, inputs and services delivery as well as processing and marketing of UA produce. These various components are quite related

1. Crop production systems include:

- Home gardening which takes place in backyards of many households
- Open space or off-plot sole cropping done in, undeveloped community and residential lands, stream banks and road sides, reservation along drainage channels, wetlands, abandoned waste dumps, rights-of-way and aircraft buffers. Mostly for market oriented irrigated vegetable production and seasonal (usually rainfed production) farming of mixed crops such as maize. Different open space UA activities and total acreage in Accra are shown in Fig 2. Field observations at the time of study showed a dominance of maize over vegetables, which is associated with the prevailing rainy season (June/July). Areas reported to be under cultivation will decrease during dry season.

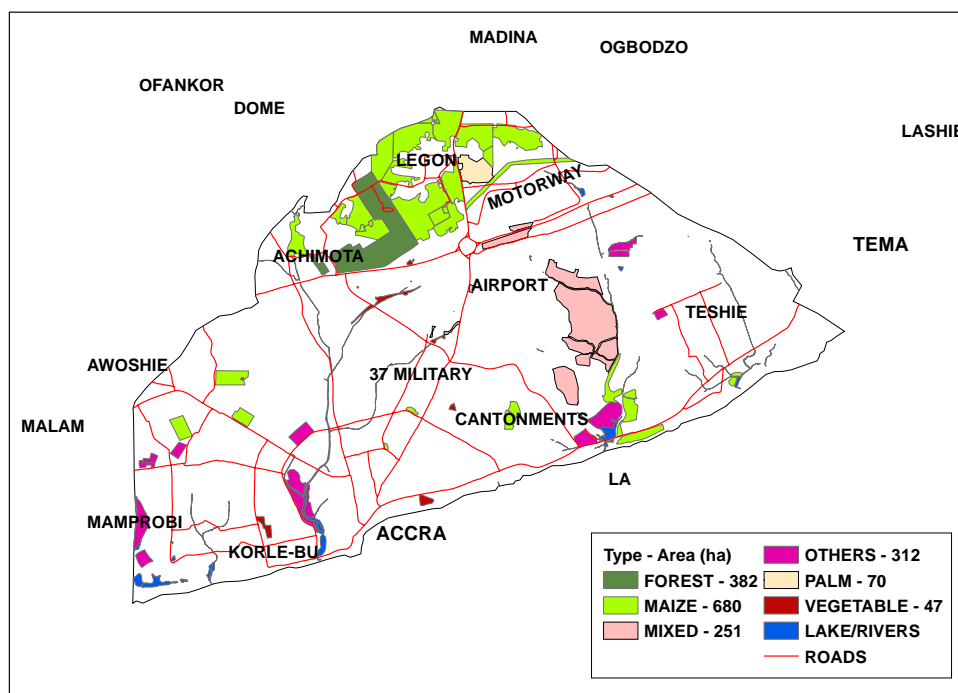


Fig 2. Functions provided by open land spaces in Accra

2. Non-crop production systems include poultry, small ruminants, dairy farming, aquaculture, floriculture and other short-cycle species such as mushroom and Grasscutter.






The main features, opportunities and constraints of the UA production systems are presented in Table 1.

3. Inputs and Services in UA: Urban farmers adopt different strategies to minimize inputs use and maximize output as inputs and services vary depending on farming system. Major inputs used include labour, land, water, equipments and simple farm tools, organic and inorganic fertilizer, pesticides, and seeds. In many cases, land and water are for free. Land used for farming either belongs to government's institutions, individuals, families and traditional authorities or chiefs (Obuobie et al., 2003). Only few farmers who use treated water pay a fee while most farmers depend on streams and drains or domestic wastewater especially for crop production. Vegetable farmers use chicken manure or/and chemical fertilizers for soil improvement and they depend on old stock or the open market for input supply. UA farmers do not have access to formal credit systems as they are not able to meet the requirements of financial institutions. However, some farmers have arranged informal input credit systems with sellers of UA products as in the case of some vegetable growers or with NGOs as in the case of grasscutter farmers association.
4. Processing and Marketing: Usually UA products (fresh vegetables, ornamental plants and small livestock) are sold at the farm gate, in local market or supermarkets for export. In Accra, marketing of UA produce is a means of sustenance for many women. Value addition through processing have been observed in the case of dairy farming

3. UA Stakeholders in Accra

The analysis of key stakeholders and their potential roles in influencing the development of UA in Accra are presented in Table 2. Different categories of stakeholders have been identified. While some of them can play significant role in facilitation, networking and policy advice, the government departments in particular are important for action planning and policy formulation. The successful integration and coordination of these stakeholders on UA issues could facilitate the development of UA in Accra.

Table 1. Features of UA production systems in Accra

FARMING SYSTEM	MAIN FEATURES	OPPORTUNITIES	CONSTRAINTS
<p>Irrigated Vegetable</p> 	<p>There are about 1000 farmers on 7 large sites, along streams and drains. Main source of income for majority. Average monthly income of 40-50US\$. Men in production while women in marketing</p>	<ul style="list-style-type: none"> -Employment creation and livelihoods support for the urban poor (e.g migrants) -Demand for fresh vegetables by urban dwellers -Temporary access to vacant plots --Availability of urban waste and wastewater as resource materials -Possibilities of linkage to related sectors -Establishment of vegetable producers and consumers networking groups 	<ul style="list-style-type: none"> -Lack/ inadequate farm inputs -Lack of farm record keeping and unstable product prices -Policies (regulatory, prohibitive, restrictive or supportive) -Health risks resulting from the use of poor quality water -misuse of agro-chemicals
<p>Backyard</p> 	<p>Prevalent during wet season Every second household in Accra is engaged in some form of backyard farming (Drechsel et al., 2004).</p>	<ul style="list-style-type: none"> -Access to fresh products -Supplement household food -Practice as a hobby -Enhance the utilization of domestic wastewater 	<ul style="list-style-type: none"> -Lack of alternative soil ameliorants -Cost of inputs -Capital acquisition -incidence of-Pests and diseases -Theft cases, -Labour
<p>Mushroom</p> 	<p>About 250 mushroom cultivators in Accra belonging to National Association of Mushroom Growers and Exporters. Expressed reason for farming include personal interest, medicinal value and high profitability</p>	<ul style="list-style-type: none"> -Health benefits/ nutritional value -Income generation -Environmental friendliness -Freshness and garnishing value 	<ul style="list-style-type: none"> -Unstable market prices -Lack of humidifiers -Lack of driers -Lack/ inadequate financial support -Lack of public awareness -Weather condition -High transportation cost
<p>Floriculture</p> 	<p>Up to 150 farmers commercial farmers identified along major roads. Farmers grow both local and exotic flowers Depend on a lot of cow dung, poultry manure, black soil/compost, and sand</p>	<ul style="list-style-type: none"> -Self employment -Income generation -linkage to urban development program on beautification of capital city 	<ul style="list-style-type: none"> -Inadequate access to water -Lack of ready market -Scarcity of beautiful flowers -lack of Access to credit -High cost of seeds -High cost of chemicals
<p>Seasonal crop production</p> 	<p>Common during rainy season on institutional lands and in pockets of open spaces in the city, predominates in the low-density areas. Basically for sales and home consumption. No specific farmers association. Land tenure arrangement is by mutual agreement, rent payment or sharecropping</p>	<ul style="list-style-type: none"> -Free access to government lands without difficulty -Income generation -Supplementation of diet (food) 	<ul style="list-style-type: none"> -Squirrels, birds, termites and grass-cutters destroy crops -Difficulty in getting access to credit, labour, and tractor services -Poor rains -Diseases -Marketing problems due to seasonal excess food crop




Aquaculture	<p>Only few aquaculture farmers in Accra. Mostly women with other sources of livelihood. Mudfish and tilapia are the main types of fish</p>	<ul style="list-style-type: none"> -Income generation -Supplementation of diet 	<ul style="list-style-type: none"> -Hot weather or high temperatures -Lack of frequent flow of water in taps -Predators (alligators) feeding on the fish -Premature death of fish -Lack of credit -Cost of pond construction, labour, transport and feed
Dairy farming	<p>Not extensive. Few farmers</p>	<ul style="list-style-type: none"> -High demand for milk products 	<ul style="list-style-type: none"> -land and feed constraints
Small ruminants 	<p>is most common in densely populated areas as an investment or 'living asset' strategy. The number of animals ranged from 4 to 200/farmer. Form an organized association in Nungua community</p>	<ul style="list-style-type: none"> -Income generation -Employment -Ready market 	<ul style="list-style-type: none"> -Feed is a problem in the dry season -High cost of transportation -Theft cases; -Access to credit
Poultry 	<p>Farmers are mainly public servants who are into part-time poultry production. Number of birds ranged from 35 to 2500 per farmer. Many farmers belong to the Ghana Poultry Farmers Association (GPFA)</p>	<ul style="list-style-type: none"> -Domestic meat source -Income generation -Chicken manure can be sold in addition to other poultry products 	<ul style="list-style-type: none"> -High cost of inputs; importation of poultry products lower prices and affect profit margin -High cost of feed and day old chicks -Outbreak of diseases -Lack of access to credit; -Cost of transportation -Marketing -High cost of utility charges
Grasscutter 	<p>Very lucrative. Supplies to hotels as grasscutter is the most expensive meat in restaurants. Farmers are well organised into an association of 45 women and 151 men.. Implementing the "<i>pass on the gift</i>" project in collaboration with Heifer International</p>	<ul style="list-style-type: none"> -Income generation -Ready market -Employment 	<ul style="list-style-type: none"> -Lack of grass as feed during dry season -High cost of transportation -Access to credit; -Difficulty in obtaining drugs

Table 2. Evaluation of key UA stakeholders in Accra

Stakeholder Group	Stakeholder	Experience in UA	UA- activities in Accra	Influence in Accra	Importance to UA	Risks to UA	Potential roles in UA
Research and Training Institutes	IWMI	+	+	+	+	Global mandate, not a local organization	Research (urban water management, irrigation) and training materials
	CSIR - STEPRI	+	+	+	+	logistics and finances	Policy advice
	CSIR - WRI Water	0	+	+	+	logistics and finances	Researcher, trainer
	University of Ghana: Agric, Noguchi, Geography	+	+	0	+	resource constraints	Training, Health and Nutrition advise; Land use mapping
Government Ministries and Departments	MOFA	+	+	+	+	inadequate supporting policy, lack of enforcement, budget constraints, land problem	Trainer, Facilitator, Supporter, Implementer
	Waste Management Dept.	+	+	+	+	consumer reject UA products	Manure supplier
	AMA Planning & Coordinating unit	+	+	+	+		Facilitator, Implementer, Policy maker
	Metro Public Health Dept.	+	+	+	+	Prohibitive bye-laws	Trainer, Implementer, Policy maker
	Ministry of Fisheries	+	+	+	+	law enforcement, insufficient support	Trainer, Implementer, Policy maker
	Ministry of Trade and Ind.	+	+	+	+	Lack of cooperation from AMA	Trainer, Policy maker
	Environmental. Protection Agency	+	+	+	+	Financial constraint, logistics, competition of land use	Trainer
	Ghana Water Company	+	+	+	+	Unwillingness to supply domestic water for agriculture	Supply of water
	Irrig. Developm. Authority	+	+	+	+	availability of land and land tenure	Trainer, Implementer, Policy maker
	Ghana Standard Board	+	+	+	+	Limited experience in UA, Limited finance for standards development	Action planner, Policy maker
EDIF	+	+	+	+	Land ownership	Trainer, Donor	
Local Associations	Producer Associations	+	+	0	+		Trainee, Implementer
	Fishers, Fish farmers	+	+	0	+		Trainee, Implementer
	Market Women	+	+	0	+	Lack of recognition and low patronage, Inflation, Financial constrains; Poor hygiene	Trainee, Implementer
Regional Programs / Donors	FAO	+	+	+	+		Donor, Networking, Policy Advisor
	GTZ	+	+	+	+	Activities restricted to five defined commodities	Facilitator, Trainer, Networking, Donor
NGOs	GROWTH	+	0	0	+	Inadequate funding, insufficient land, inadequate policy	Producer of compost
	Enterprise Works	+	0	0	+	Financial constraints	Implementer – based on irrigation technologies
	Heifer International	+	+	0	+	Budget constraints, insufficient land	Implementer of UA projects esp. crop-livestock integration
	Peoples Dialogue	0	0	+	+		Experience in community mobilization of the poor, micro enterprise schemes
	World Vision	0	0	+	+		Urban ministry unit aims at urban food security
	ADRA	+	+	0	+		Trainer, Implementer, Networking
	Catholic Relief Services	+	+	0	0	limited farm lands and finance, land reforms	Trainer, Implementer

Legend: + positive, 0 neutral,

4. Significance of UA in Accra Metropolis

4.1. Urban food supply

Backyard farming supports main employment through income from sales of surpluses, savings on food expenditures, and exchange of agricultural products for other economic goods. Moreover, it is an avenue for growing medicinal plants and for domestication of short-cycle species such as grasscutter and mushroom. About 50% of all households in Accra have small backyard garden where they cultivate food or ornamental plants or raise small animals for household food consumption.

4.2 Employment opportunity and livelihood support

Open-space vegetable production is commonly a full-time job for many poor people. It supplies more than 80% of spring onions and lettuce consumed in Accra (Drechsel 2005). It supports about 1000 farmers' livelihood and could yield high monthly income per farm which is well above the *per capita* General Net Income of US\$ 27/month in Ghana. Moreover, an estimated number of 200,000 people who patronise restaurants and street food in Accra benefit from urban produce every day. On the macro level, the contribution of urban agriculture to the Gross Domestic Product (GDP) may be small, but the importance for certain commodities, such as vegetables and meat might be substantial. Apart from direct economic impact, there are also indirect social benefits that derived from the economic gains, such as the possibility to pay school fees, acquire more household assets and pay for better health care and livelihoods support (Danso et al, 2002). Many women in Accra are gainfully employed by marketing and processing of urban products

4.3. Contribution to improved environmental sanitation

UA creates an avenue for recycling readily available urban organic wastes, thereby improving the productivity of farming systems as well as environmental health. UA facilitates the recycling of waste such as poultry manure, cow dung, market/household waste, human waste etc. The use of black soil from local waste dumps for landscaping is common and there is high demand for compost by the estate development sector. The amount of waste required to meet the demand of farmers and estate developers within and around Accra, could be provided solely from the waste generated on the main city markets. Specifically, the real estate development sector could transform about 18% of the available organic waste into input for gardening and landscaping (Drechsel et al 2005). Moreover the high percentage of urban backyard gardens in the city shows that waste recycling at the household level can reduce the amount of waste at source while contributing to soil improvement. Apart from organic waste recycling, urban vegetable farming reuses of wastewater. This is often associated with health risks but there are on-going initiatives in Accra towards minimising the risks (Box 1). Urban greening (trees, grasses) can have an important productive and ecological role in cities. It can provide for family nutrition (e.g fruit trees), medicines, but also considers recreational and aesthetic benefits. It contributes immensely to the quality of life in urban areas. It can be used to purify micro-climate in cities and impact on the water cycle and water conservation.

Box 1. Minimising health risks in UA: 'Farm to Fork' Contamination Investigations in Ghana

In urban and peri-urban areas, irrigation water sources are often heavily polluted by urban run-off and untreated wastewater. Due to the high costs of wastewater treatment, alternative options for reducing health risks have to be explored

The proximity of (peri)urban agriculture to consumers ensures the freshness of the produce and reduces transport costs, thus allowing higher incomes. This is especially important in Ghana, where refrigerated transport and cool storage are scarce and more and more poor people live in and around urban centers. Banning the use of polluted water has failed as this threatens the livelihoods of farmers and sellers, as well as the supply of vegetables to the city. Municipal authorities in charge of health and agriculture, and the national research council in Ghana (CSIR) as well as. Researchers from the Kwame Nkrumah University of Science and Technology (KNUST), IWMI, other universities and institutes in Burkina Faso, Denmark, Ghana and Senegal, are now testing options to reduce health risks along the 'farm to fork' contamination pathway, and draft guidelines, awareness materials and training modules for stakeholders (farmers, sellers, consumers, local authorities, WHO) on risk-reducing options and technologies. The projects are funded by the Challenge Program on Water and Food with support from DFID and DANIDA. **For more information, contact P.drechsel@cgiar.org**

4.4 Gender relations and social networking

Men dominate urban farming in Accra. In particular, fewer women are involved in vegetable production than other production systems. Whereas men only supplement their effort with paid labour, half of independent women cultivators mainly depend on paid labour (usually male labourers) to carry out land clearing and preparation. Women, often with limited financial resources, cultivate relatively smaller plots. While male farmers produce more water-demanding crops such as lettuce, cabbage and cauliflower which are more profitable, the women grow less water - demanding and less profitable crops like okro, yoyos (*corchorus* sp) and alefi (Amaranths). Women however, play a major role in the marketing of urban vegetables. Male farmers do not engage themselves in direct marketing to consumers; rather they sell to the women who then deal with consumers. Several reasons have been given for this gender differential in farming and marketing: (1) the arduousness of farm work, especially land clearing, land preparation, lifting water for irrigation and spraying with insecticide (2) cultural definitions of gender roles, i.e. men do the farming and women the selling, 3) the general perception that marketing is more profitable and less risky than farming, women are usually better at bargaining for favourable prices.

Few producers' associations exist among UA practitioners in Accra. This has strengthened the social interaction, relationships as well as the capacities (technical and resource wise) of members. This in turn contributes to unity of members, and agricultural growth e.g the grasscutter farmers Association (Box 2). Not all producers are so far organised into formal associations

Box 2_“Pass on the gift”-

This is a collaborative project between *The Ablekuma Grasscutter Association* and an NGO- Heifer International. It is a sustainable means of ensuring the supply of grasscutters for farmers. The farmers association provides each beginner with two females and one male grasscutter breeds. The farmer receiver rears them till they reproduce and thereafter passes on the gift by paying back with five offspring. Beneficiaries remarked that that this has been very helpful in raising more grasscutter. When the association receives the offspring, it follows the procedure by passing on two females and a male to another beginner who continues the procedure and the gift is thus passed on from one new farmer to the other. The interesting thing is that no money is paid for the initial grasscutter received by members of the association. The only requirement is that each farmer pays his membership dues regularly.

5. Constraints to UA development in Accra

In spite of the benefits, UA in Accra is faced with challenges which tend to limit its acceptability and constrains its development.

1. Limited access to land and problem of insecurity even where there is access. This is mainly due to population growth and competitive use of land for more valued urban development projects such as estate development.
2. Limited access to water resources. It is difficult to find farm sites with, reliable and cheap water access. With the increasing populations and the proximity of the farms to the markets hence consumers, the demand for especially vegetables is high. This increased demand has led some farmers to use virtually any open space (gap) including undeveloped plots and uncompleted building areas in the city and more than often using the nearest water source available which range from poor quality water like the ones in streams to very poor quality water as in gutters and sewage pipes. This exposes urban farming to urban pollution and non-acceptability by policy makers.
3. Lack of services and credit facilities,
4. Health and environmental risks from the use of pesticides, non-treated organic waste and waste water, as well as improper post-harvest handling of produce during processing and marketing.
5. Lack of institutional framework for UA and lack of organization among stakeholders to facilitate advocacy and lobbying for consideration of UA by policy makers

6. Towards Urban Agriculture Development in Accra

UA related issues in Accra currently fall under the jurisdiction of different levels and types of authorities (e.g. MoFA, Town and Country Planning, Forestry, Parks and Gardens, Public health department, Urban Planning, etc). Although there is no specific policy on UA, smallholder agriculture development is highlighted almost in all major policies, programs and projects such as Ghana Poverty Reduction Strategy, Modernization of the Capital City and Decentralization Policy. This has not yet enhanced the development of UA but there are opportunities for better integration of UA in the overall city development policies and programs as shown in Table 3

Table 3. Effects of Policies and Programs on UA in Accra[#]

No.	Policy Document/ statement	Actual impact on UA	Potential impact	Stakeholders involved	Policy intervention related to UA
1	AMA	++	+++	AMA- DTCP, DP&G, MEHU, MPCU	Review and formulation of AMA bye-laws
2	Ghana Poverty Reduction Strategy (GPRS)	+	+++	AMA-MoFA, Ministry of Local Government	Promoting smallholder agriculture in Urban Areas
3	Heavily Indebted Poor Country	0	+	AMA, NGOs	Allocation of some funds to urban areas
4	HIV/AIDS Policy	0	++	NGOs, AMA	Promotion and awareness creation to establish the HIV and UA linkage.
5	Modernisation of the capital city	0	+++	Ministry of Tourism	Integrate UA into their policy
6	Decentralization	++	+++	AMA, District Assemblies	Lobby for more Funds to support UA, implement UA activities
7	Environmental Protection Agency (EPA)	+	++	Health Department	Implementation of adoptable by-laws on health issues.
8	Agricultural Extension Policy	+	+++	MoFA	Technical advice agriculture in cities
9	Gender and Agric Development Strategy	0	++	MoFA, NGOs	Gender mainstreaming in UA

[#]Evaluation is based on the assessment of various policy documents and mandates of the different government departments.

DTCP – department of town and country planning; DP&G, - department of parks and gardens; MEHU – metro health unit; MPCU – metro planning and coordinating unit. Definition of impact criteria 0 – no impact; + = low, ++ = high, +++ = very high impact

7. Emerging Issues and Intervention Areas for UA development in Accra

7.1 Policy and Legislative support for UA

Currently there is no specific policy support for UA. This makes the practice of UA unplanned and unsupported. There's also no legislative support for UA \making it difficult to protect people involved in and deriving livelihoods from the area. Agriculture has been perceived to be a rural activity and so UA has not received the required attention, though the dynamics of UA is quite different form rural agriculture. This perception has led to the lack of conscious effort to support UA. UA agriculture has thus been haphazard, unplanned and unsupported and regulated. Development of institutional policy and legislative framework that will enable municipal, national authorities and other stakeholder institutions work together to support and promote urban agriculture is an urgent need and crucial component of the development process

7.2 Education and public awareness on urban agriculture, and urban food safety towards positive perception of UA

Certain practices in UA have engendered negative perceptions about it. It is important that these are addressed because there are several farming systems in UA agriculture. Shedding light on these issues will help the public to take decisions on what product of UA they would want to patronize. Highlighting the role of the consumer in ensuring food safety regarding handling, storage and processing will suffice as contributions to reducing the associated health risk of UA.

7.3 Capacity building for farmer associations: Facilitate the formalisation of farmer associations

Associations will provide guidance on several issues involved in the procurement of inputs in urban agriculture. Their negotiations could result in discounts on certain farm inputs. The purpose of such associations has been to advice, organize training and learning programs, help in marketing UA products and to seek the welfare of members. The associations promote UA as a business, train the youth, and contribute to poverty alleviation. They help the membership to establish working relationships with other stakeholders in the business. Specific areas that need attention include:

- *Access to credit*: Access to loans will help UA practitioners to expand their businesses. Most of them have to fund themselves or make an arrangement with the market women to provide them with some advance payments. This results in undue exploitation by such individuals extending financial assistance. Regularising access to credit will enable farmers obtain optimum profit from their businesses.

- Access to appropriate farm inputs: If the inputs used by UA farmers are cost effective then one could be sure that the necessary dividends will accrue to them, thus making the venture sustainable. If the inputs are expensive and at the same time not available to the farmers, it becomes almost impossible to produce enough to feed the rapidly increasing urban population. Access to land is a major input of urban vegetable growers.
- Record keeping: Without good record keeping of UA activities, accounting for its performance will be extremely difficult. There is the need for good planning in this area since it's the only way through which prudent financial decisions could be made UA. It is also important for analysing cash flows in the venture, which will be a key requirement for any institutions that are into provision of credit for small and medium scale enterprises.
- Use of agro-chemicals: Use of inappropriate technology, bad agronomic practices and reducing soil fertility of some urban farms, has made many farmers to look for alternative soil inputs to increase soil fertility and outputs as well. Lack of adequate training in the use of these chemicals endangers lives of the farmer and consumer as well as raises the contamination levels in the environment. Education will reduce the level of ignorance regarding the use of agro-chemicals

7.4 Land Tenure and urban agriculture

- Explore the possibility of land allocation for UA on urban fringes

With lands within the urban areas diminishing, policy makers have the opportunity to zone lands on the fringes of urban areas for urban agriculture. It will be important for such lands to be backed by the appropriate legislation to protect it from encroachers and estate developers. Such interventions will contribute to food security in the urban centers

- Support UA on institutional land

Many of the lands on which urban agriculture occur belong to institutions. Though this makes the future of UA on such lands uncertain, it is possible to encourage these institutions to integrate urban agriculture in their land planning or encourage informal arrangements between the institutions and urban vegetable growers.

- Demarcation/zoning of open spaces for specific forms of UA

Within the city or urban areas, there could be policy interventions to demarcate specific areas for urban agriculture. Guidelines for operating on these lands could be drawn to ensure good standards in urban agriculture. It's a good intervention by governments in addressing some of the challenges of unemployment

7.5 Promotion of UA enterprises

- Promotion of short-cycle species in UA (e.g. mushroom, grasscutter, snail, poultry, Aquaculture, bee keeping in the peri-urban etc), ornamental crops and space confined technologies

- Promotion of herbs and medicinal plants for healthier living. Herbs and medicinal plants within urban agriculture are important in addressing the health challenges of individuals, e.g. reducing blood cholesterol levels and cut down on body weight. Thus could be recommended by nutritionists for individuals within this category.

With the increasing pace of urban development and urbanisation, it strikes a cord in our UA strategy to critically reconsider the space-confined components of UA. These components have short production cycles and high turnover. Secondly technology involving the production is easily transferred through systematic capacity building training activities. It is a major intervention to the urban unemployment situation since supply of products within this component has not been able to meet even the local demand.

- Urban ruminants production systems: e.g. for dairy farming and processing of dairy products

The demand for dairy products in the urban areas is high and yet the industry still remains rudimentary in the urban areas regarding interventions. Yoghurt, a product of dairy activity within urban areas holds very good prospects because of its good taste and nutritional content. That is to say that supply is far below the level of demand.

7.6 Development of collaborative UA projects/programmes among key stakeholders.

Urban agriculture is multidisciplinary in nature and involves several stakeholders. Therefore approaching project implementation from the multi-stakeholder angle gives opportunity to all key stakeholders to bring their unique expertise and institutional identity to bear on the project. In the end a better result is achieved than a single stakeholder would have as the satisfaction spectrum within the general populace is widened.

7.7 Strategies to minimise health and environmental risks associated with UA

Addressing the health and environmental risks associated with UA will help boost the confidence of the public in patronising UA products. Currently, one key issue in this category is the use of marginal quality water for cultivation of vegetables. Some of these vegetables are eaten raw and hence interventions such as safer irrigation techniques, improved shallow wells, etc that will minimise health risk in polluted water is extremely important.

Another associated health risk is contamination through pesticide use. The use of unapproved pesticides and dosage rates on vegetables, coupled with non-adherence of pre-harvest intervals, can result in pesticide residues in UA produce and its attendant biological magnification in the food chain.

Similarly, inadequate post-production handling can result in the toxicification of certain products. All these combine to present health and environmental risks to the consuming public and requires enforcement of regulations, policy and extension interventions.

7.8 Improvement in post-production handling of farm produce –processing and marketing.

This requires knowledge of the contamination pathway of pathogens on urban farm produce. Important in this category is the need to institute innovative processing methods, packaging, storage and carriage from one point to the other. The nature of post-production handling determines losses, which is also linked to profit margins. Therefore post-production handling will need to be addressed in a holistic manner so as to be able to offer concrete solutions to the various blocs of the problem. Attempts at promoting value addition through processing and packaging will improve the shelf life of agricultural produce and attract better market prices and increased income. Similarly, development of affordable and locally-based storage innovations will enhance availability of products over longer period and stabilise markets.

7.9 Gender and urban agriculture

There are several aspects to the labour components of the various farming systems in UA. In some cases there could be distinct differentiation of labour in UA. Secondly the production, marketing, and processing of UA products are gender induced. Thus any intervention in UA will affect men and women differently and will therefore be important to the policy maker to carefully weigh the level of impact of such interventions with the hope to reducing the weaknesses and increasing the strengths of the various gender groupings.

However, female involvement in urban agriculture has been greatly influence by perception and roles as defined by social norms and values. Thus, marketing is seen as the role of women and production by men. Again, women access to land has also been observed to be influenced by societal norms. The consequences have been that women involvement in UA has been comparatively minimal and so continue to remain within the poverty bracket. Interventions in UA must therefore be targeted, designing gender sensitive interventions, rather than general intervention measures which might not necessarily meet the need of male and female together.

7.10 Monitoring and evaluation in urban agriculture

Data on UA is scanty. This does not allow for proper planning and decision making. It also does not lend to accurate benchmarking and for effective monitoring and evaluation of UA. Maintaining a reliable database and regular monitoring and evaluation in urban agriculture will help identify whether the objectives set for the necessary interventions are being

achieved. It will also help to procure the right data and information for decision-making. In this case strategies can be redefined to enable objectives to be achieved. Inherent in monitoring and evaluation is the efficiency which, links input to output and effectiveness which, links results to set objectives.

7.11 Coordination

With many stakeholders involved in urban agriculture there's the need for coordination to ensure focus and overall flow of information among them. Coordination is necessary in ensuring that activities aimed at helping people involved in UA are not duplicated and that shared effort and resources lead to increased efficiency. Proper coordination could be achieved through internal restructuring and creating regular platforms for inter-sectorial information sharing and exchange.

7.12 Networking and linkages

There's the need for networking with organizations within and outside Ghana for the purposes of information support and funding.

Conclusions

In the light of the foregoing discussion, successful development of UA for the future should be based on the integration of a variety of strategies that combine social, economic and environmental concerns in the context of current institutional setting with the issues of food security and urban development. Hence there is need to formulate more diversified and regulatory policies that seek to actively manage UA risks through an integrated package of measures, involving all stakeholders in the analysis of problems and development of locally applicable interventions. With appropriate strategies in place, UA can expand as urban food demand increases. A possible approach may be through learning alliances and participative multi stakeholder processes for action planning and implementation and improvement.

Urban agriculture presents complex interactions of social and environmental phenomena. The future habitability of cities will depend on whether decision-makers and urban planners develop and adhere to coherent policies for managing the urban and peri-urban areas. The municipalities and state should need to formulate and implement urban development policies based on guidelines and models of expansion that take into account the need to reserve areas for greening and agricultural purposes, thus giving the city and its outskirts the possibility to feed a significant part of the population with local fresh production. It is necessary to design urban development plans that impose specific rules for utilization of land, banning unauthorized structures and creating areas for agricultural production within sustainable systems in the city and the immediate surroundings. An

adequate legislation, leasing of plots and gardens through a contract recognized by the municipality and correctly registered are measures which would guarantee rights by the potential farmers, vegetable growers and livestock producers

With regards to the contribution of UA livelihoods, to urban development, community food security and poverty alleviation, it is important to identify appropriate policy responses for the development of urban agriculture. This study tried to identify the political, institutional, economic and environmental conditions for UA development and opportunities for the implementation of policy options for UA development. The major conclusions are:

- There are no specific policies on urban agriculture in the country. The AMA bye-laws on UA tend to be restrictive rather than conducive.
- The major policy sectors which may facilitate UA are food security, land use, water, health and the environment.
- There may be the need to look at specific policies aimed at particular objectives to which UA can make a significant contribution.
- Policies that can promote food security are those that facilitate secured access to land (e.g through leasing schemes for public and private land), water, human capacity building and access to technology and markets
- Policies that may improve the urban environment are incentive schemes for waste and wastewater recycling, inclusion of UA in urban zoning and environmental management.
- There is need to promote the establishment of functional city multi-stakeholder Working Group on UA for dialogue and consensus building at city level, towards the integration of UA in development plans.
- Promotion of participatory, site specific and interdisciplinary field research on UA with policy and action orientation.
- Mobilizing investment and public-private partnerships (PPP) for the establishment of facilities for farmers markets, decentralized collection and recycling of organic wastes and wastewater

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