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ERADICATION OF EXTREME POVERTY AND HUNGER USING URBAN AGRICULTURE AS A TOOL FOR SUSTAINABLE LIVELIHOOD

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Abstract

In order to eradicate extreme poverty and hunger and promote sustainable development through Millennium Development Goals (MDGs), the United Nations Millennium Declaration was adopted in September 2000 at the largest ever gathering, committing countries both rich and poor to do all they can to eradicate poverty and hunger, promote human dignity and equality and achieve peace, democracy and environmental stability, achieve universal primary education, promoting gender equality and empower women, reduce child mortality, improve maternal health, combat HIV/AIDS, malaria and other diseases, ensure environmental sustainability and develop a global partnership for development. It is because of these and more especially goal one, to “eradicate extreme poverty and hunger”, that prompted this study. It focused on assessing the contribution of urban agriculture as a tool for sustainable livelihood in Kwale, Delta State. Emphases were laid on the characteristics of the urban farmers, major urban agricultural activities, its impact on household income and food security, and finally the challenges facing urban agriculture in the study area. Twenty (20) urban farmers were randomly selected from each of the four zones that encompass Kwale giving a sample size of eighty (80) respondents used for the study. Information obtained were analysed using simple descriptive statistics such as frequency distribution tables, percentages and bar charts. Two hypotheses were postulated and tested in the course of this study using Spearman’s correlation coefficient (ρ). The findings from the study indicate that urban agriculture is an important source of supply in urban food system, income options for households, and creates full time employment. The challenges for urban farmer are land, inadequate capital, and high cost of labour. Since current employment situations in the urban areas do not generate adequate income for the poor urban population, it is therefore recommended that urban agriculture should be integrated into urban land use planning in the state as a source of urban income, employment and food security. Government as the principal land owner should liaise with individuals and group land owners to devise appropriate mechanisms to release undeveloped plots of land within and around the city for agricultural purposes. If some of these recommendations are properly addressed, urban agriculture would help to reduce urban poverty and achieve livelihood sustainability.

Key Words: Millennium Development Goals (MDGs), Poverty Eradication, Spearman’s Correlation Coefficient, Sustainable Livelihood, and Urban Agriculture.

INTRODUCTION

Urban agriculture (UA) can be defined as an agricultural enterprise located within or on the fringe of a village or 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. (UNDP, 1996) (Mougeut, 2000), Baker & Sabel-k (2000). With the increase in rural-urban drift, urban poverty, food insecurity and malnutrition, the strategy to improve urban livelihood, as well as urban food security and nutrition have taken center-place in global discuss in sustainable environmental management (Amar-Klemesu, 2000; Veenhuizen, 2006).

Urban agriculture is widely practiced as an informal economic sector across many African cities. Even though urban agriculture is a viable activity to complement food supplies from rural areas to towns and is a means of income for many urban poor, its contribution has been underestimated. Urban agricultural producers are also often discouraged and ignored by the society and in policy reforms. This is mainly because national governments, international organizations, and researchers have no substantial experiences with characteristics of urban livelihoods, unlike rural areas in Africa. The rise in population is more pronounced in urban areas as a result of migration of people from rural areas among other factors. For instance, It has been forecasted that by 2015, twenty-five (25) countries in Sub-Sahara Africa will have higher urban than rural populations and by 2030, the number would increase to forty-one (41) (UN-Habitat, 2001). In 2000, the United Nations reported that 30% of West Africans lived in urban areas. This figure is expected to increase to 55% by 2030. Thus, cities may need to consider agricultural production in urban areas or urban fringe to reduce the food insecurity and prevalence of poverty With Urban Agriculture increasing in cities in developed as well as developing countries, a number of cities are revisiting existing policies or formulating new policies and actions programs on Urban Agriculture; (Veenhuizen, 2006). Rapid population growth and urbanization in developing countries like Nigeria imply high demand for food and require urgent supply response to prevent widespread famine, especially among low income consumers (Pingalip, Stamoulisk & Stringer, 2006).

In order to eradicate extreme poverty and hunger and promote sustainable development through Millennium Development Goals (MDGs), the United Nations Millennium Declaration was adopted in September 2000 and in line urban agriculture proves to be a sustainable strategy. According to Nugent (2001), sustainability in its essence refers to the ability of something to endure over time. Sustainability of urban agriculture basically implies its ability to continue in the future and operate at the current or increased levels. In order to be sustainable, urban agriculture should be profitable and economically viable, environmentally sound, socially just and culturally acceptable. Urban agriculture is sustainable if it maintains its dynamism and flexibility, adapting to changing urban conditions and demands, intensifying productivity and diversifying its functions for the city, while enhancing synergy and reducing conflict and thus gaining more social and political acceptability. In certain parts of a city, present forms of urban agriculture may fade away or change its form and functions drastically, while new forms of urban agriculture may develop in other parts. Longer-term urban agriculture seems to be sustainable; especially when it's potential for multi-functional land use is recognized and fully developed. This multi-functionality of urban agriculture makes it a cheap producer of public goods. Sustainability of urban agriculture seems strongly related to its contributions to the development of a

sustainable city i.e. one that is inclusive, food-secure, productive, and environmentally healthy. According to Fialor (2002), the sustainability of peri-urban agriculture hinges on the security of access to land input use and availability, output levels obtained and the prices received per unit of output, as well as capacity to achieve these prices without significant negative environmental consequences. For example, Fialor (2002) showed an increase in seasonal and annual demand (which cannot be satisfied) for peri-urban agriculture produce in Kumasi, Ghana. The environmental considerations in measuring sustainability in Kumasi showed a low but increasing threat from peri-urban agriculture, particularly with regard to pesticide use. In order to sustain peri-urban agriculture, there is a need to intensify production and to adopt production strategies that can minimize costs, while reducing risks for health and the environment. However, the author concludes, the main factor for sustainability seems to be improving the security of land access.

At the start of the twenty-first century, the problem of global sustainability became widely recognized by world leaders, and a common topic of discussion in many parts of the world. The main factors constraining sustainable development of urban agriculture are inappropriate urban policies and regulations, limited access to productive resources and insecure land tenure, labour shortage, lack of support services and appropriate technologies and lack of Organization among urban farmers. These seem to indicate that peri-urban agriculture is sustainable if it maintains its dynamism and flexibility, adapting to changing urban conditions and demands, intensifying productivity and diversifying its functions for the city while enhancing synergy and reducing conflict, and thereby gaining more social and political acceptability (De Zeeuw 2005; Gerstl, 2001; Yi-Zhang & Zhang, 2000). These could make peri-urban agriculture unsustainable unless other functions of peri-urban agriculture are appreciated. Mireri (2002) showed that in Nairobi, Kenya, commercial urban agriculture is a viable economic activity, but criticizes the sector's limited credit and investment opportunities to effectively spur its growth and development. He concludes that the government has an invaluable role to play in promoting sustainable urban agriculture. The integration of urban agriculture into the urban land use system and the creation of a favourable policy environment are critical steps in the development of the sector. Furthermore, there is a need to form farmers' associations and marketing cooperative societies. A strong farmers' association can articulate and lobby for necessary government recognition and general development of the sector.

Obuobie, et al, (2006) and Drechsel, Graefe, Sonou, & Cofie, (2006) argued that many other expressions of peri-urban agriculture may have to be considered temporary phenomena or 'urban shifting cultivation' where farmers have to move to another site in the vicinity or to the peri-urban fringe: mobility is a crucial and coping strategy of these livelihoods. Peri-urban agriculture may bring perishable crops closer to markets (since refrigerated transport or open import markets are lacking); help to Villages saving money in low income situations (via backyard production); and provide food in crisis situation, but as soon as these problems are solved, these peri-urban agriculture expressions might lose their significance. Danso, Drechsel, Akinbolu, & Gyiele (2003) summarized their findings for the Ghana situation, as shown in addition to such problems having the tendency to become structural (e.g. in western countries, many urban people are also impoverished), improving these conditions may take generations and such peri-urban agriculture expressions might take up other functions. Community gardens, for instance, may become less important for food production, but very important for social inclusion or for recreation. Urban agriculture requires political legitimacy and financial support if it is to continue developing as a productive force Cabannes (2006).

The contribution of urban agriculture to food security and healthy nutrition is probably its most important asset. Food production in the city is often a response of the urban poor to inadequate, unreliable and irregular access to food and lack of purchasing power. In urban settings, lack of income translates more directly into lack of food than in rural settings. Urban agriculture is an important source of income for a substantial number of urban households. In addition to income from sales of surpluses, farming households save on household expenditures by growing their own food, which can be substantial since poor people generally spend a sizeable part of their income (50–70 percent) on food. Urban agriculture also enhances the development of micro enterprises in the production of necessary agricultural inputs (e.g. fodder, compost, earthworms), the processing, packaging and marketing of products (Homem de Carvalho, 2001) and the provision of services such as animal health services, transportation (Moustier & Danso, 2006). According to Mireri (2002) urban agriculture is an important economic activity both for poor and commercial urban farmers. It constitutes an important food security strategy for poor urban farming families. Commercial urban agriculture makes a significant contribution to employment and income generation. The role of urban agriculture has become even more critical in Kenya because of the deteriorating urban poverty situation. Kenyan urban poverty is estimated at 50 percent and it is feared that the situation will deteriorate in the future.

Urban agriculture may function as an important strategy for poverty alleviation and social integration of disadvantaged groups (e.g. HIV/AIDS-affected households, disabled people, female-headed households with children, elderly people without pensions, jobless youth), with the aim to integrate them more strongly into the urban network, provide them with a decent livelihood, and prevent social problems such as drugs and crime, (Garrett 2000; Gonzalez, Mario, & Catherine., 2000). Urban and peri-urban farms may also assume an important role by providing recreational and educational activities to urban citizens or in landscape and biodiversity management and community building (Smit & Bailkey, 2006). Waste disposal has become a serious problem for most cities. Urban agriculture can contribute to solving this and related problems by turning urban wastes into productive resources (Cofie, dam-Bradford & Drechsel, 2006): compost production, irrigation with wastewater. Urban agriculture and forestry may also positively impact on the greening of the city, the improvement of the urban micro-climate (wind breaks, dust reduction, shade) and the maintenance of biodiversity (Konijnendijk, Authier & Veenhuizen, 2004). They may also reduce the city's ecological footprint by producing fresh foods close to the consumers, thereby reducing energy use for transport, packaging and cooling, among others.

Despite Nigeria's rich agricultural resource endowment, however, the agricultural sector has been growing at a very low rate. Less than 50% of the country's cultivable agricultural land is under cultivation. Most of these lands are cultivated by smallholder and traditional farmers who use rudimentary production techniques, with resultant low yields. The smallholder farmers are constrained by many problems including those of poor access to modern inputs and credit, poor infrastructure, inadequate access to markets, land and environmental degradation, and inadequate research and extension services. In response to the dwindling performance of agriculture in the country, governments have, over the decades, initiated numerous policies and programs aimed at restoring the agricultural sector to its pride of place in the economy. Nigeria is participating in the Sustainable Cities Programme (SCP) under the Urban Management Programme (UMP) of the United Nations Centre for Human Settlement (UNCHS/World Bank/United Nations Development Programme (UNDP). Under the programme, Ibadan, Kano and Enugu have commenced their project. Urban agriculture was

encouraged in Nigerian cities with the introduction of “Operation Feed the Nation” in 1979, when households were encouraged to plant food crops around their houses. This opened the eyes of urban dwellers in Nigeria to the prospects of growing food crops in the urban area in order to earn some income and at the same time provide much needed food for urban families. However, no significant success has been achieved due to the several persistent constraints inhibiting the performance of the sector (Manyong *et al*, 2005).

Throughout the globe, agriculture is increasingly a part of city landscapes, and Kwale, Delta State Nigeria has not been left out. It has natural vegetation that supports agricultural activities. Presently urban farmers in Kwale, like those in other parts of Nigeria, operate without formal recognition of their main livelihood activity, lack the structural support to enhance their potential and mitigate environmental risks and hazards. Urban environment is more complex and diverse, and urban livelihoods are dynamic. “Without a better understanding of how urban dwellers organize their livelihoods and how they cope with vulnerability and risk to protect their household food security, little progress can be made in improving their conditions and with particular attention to its potential as a socio-economic, and environmental benefit, this will be guided with a view to providing and establishing its importance on the household and local economies of dwellers in Kwale. This calls for research into Urban and Peri urban agriculture in the study area with a view to assessing its importance and contribution to sustainable urban livelihood and development.

CONCEPTUAL FRAMEWORK

The World Summit on Sustainable Development confirmed that the first decade of the new century would be one of reflection about the demands placed by human kind on the biosphere. However, the idea of sustainability dates back more than 40 years, it was a key theme of the United Nations Conference on the Human Environment in Stockholm in 1972 (McCormick, 1992). Conceptually, urban agriculture is complementary to rural agriculture; it is integrated into the local urban economic and ecological system. The term was originally used only by scholars and media, but now been adopted by even international agencies like the UN agencies such as the UNDP (FAO, 1996 & 1999). In a world increasingly dominated by cities, the international community has started to address the issue of urban sustainability with international meetings and agreements, such as Agenda 21 in 1992, the 1996 UN City Summit in Istanbul, Turkey, and in the World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002. Urban sustainability issues are also included in the MDGs. Increasingly; Urban Agriculture has always been part of the city. Its functions may change over time as well as the degree of policy attention it receives, but it has always been an integral part of the urban system. The question is whether it is sustainable under the present conditions.

The sustainable livelihoods approach discussed by (Farrington & Carney, 1999) focuses on the integral assessment and discussion of the major livelihood assets of the households concerned, the livelihood strategies they apply with the help of these assets, their vulnerability to stresses and shocks, the constraints and opportunities, and the support received from local institutions and policies. Generally, five types of assets are distinguished: natural capital (such as land and water); physical capital (animals, equipment, animals); financial capital (money, infrastructure); human capital (skills and ability); and social capital (social networks, support by other households, etc). Constraints and opportunities may lie in each of these spheres. There are variations: Smit & Bailkey (2006), for instance, specify

seven types of capital to point out the building up of urban community capitals. In addition to natural, human, social, physical ('built capital') and financial capital ('economic capital'), the authors add 'political' and 'cultural capital'. The core principles underlying this approach are the focus on people and their strengths, a good understanding of local dynamics, and making links between local issues and wider concerns about policies, institutions and processes. The sustainable livelihoods approach may facilitate identification of competing and complementary non-agricultural activities within farm households and the recognition of alternative or complementary development options. Using this approach may result in a classification of urban farm household livelihood systems that incorporates the non-agricultural activities of the farm-household and needs other than just food and income (e.g. access to basic services, empowerment). A growing number of publications use this approach in analyzing urban farming, which is especially useful at the household level in a specific city. It remains difficult, however, to assess the economic impact of UA at the city level and compare technologies between cities.

REVIEW

Alison, Angela, Cassia, Micheal & Noah (2014), researched on public participations of urban Agriculture's position in Vancouver, Canada, found out that perceptions influence the progression of urban agriculture movements today, and this will continue as a point of interest in the future. Despite a small contribution in quantities produced a wide range of farming activities occur in London (allotment gardens, private gardens, county farms, parks etc), Garnett (2000). It is argued that there are plenty of opportunities in the multiple and flexible forms of urban agriculture. Urban agriculture increased the diversity of crops and had a dramatic impact on the deteriorating food situation in Havana. Moreover, their government made land available for farming providing secure land-use rights and there are a number of regulations concerning urban agriculture e.g. on the use of pesticides (Gonzalez, Mario, & Catherine, 2000).

In the review of African and Asian case studies, (Berg & Van, 2002; Berg, Van & Veenhuizen, 2005) concluded that urban agriculture can play many different roles and that peri-urban agriculture is highly dynamic, principally because of severe competition for urban space for other functions. The authors argue that the sustainability of urban agriculture in the long run depends on the degree of synergy and conflict between peri-urban agriculture and the city. The synergy of peri-urban agriculture with the city must be enhanced by adapting to the urban circumstances for instance by producing specific products and by combining with other urban functions such as recreation (Jiang, Yuan, Liu & CaiJianming, 2005) and landscape management. Conflicts must be remedied with the city by reducing negative externalities by changing to agro-ecological production methods with less associated health and environmental risks.

Remenyi (2000) studied the contribution that urban agriculture makes to the livelihoods of poor people in Berlin. This paper looks into the contribution that urban agriculture makes to the livelihoods of poor people, especially recent in-migrants from rural areas. The research is based on slum dwellers in Dhaka Bangladesh. The paper reports on work in progress, including the use of participatory techniques for assessing the contribution that urban agriculture makes to employment, income generation and cash flow into poor households in the slum areas of Dhaka. The results are relevant for how poverty programs are designed, and for how urban planning needs to coordinate with microfinance providers to ensure that the potential contribution of urban planning to poverty reduction is realized.

Martin & Oudwater (2000) studied Urban Agriculture and the livelihoods of the poor in Southern Africa. The paper focuses on three dimensions of the social, institutional and planning context of urban agriculture. Firstly an analysis of the contribution of urban agriculture to the livelihoods of different social groups; secondly, factors affecting the outcomes of urban agriculture projects, and thirdly, the linkages between households, communities and the planning authorities. In Southern Africa there is increasing awareness and interest among policy makers concerning the potential of urban agriculture, but present policies provide limited support. Calory (2010), researched on urban and peri-urban agriculture as a poverty alleviation strategy among low income households, the case of Orange Farm, Johannesburg. The study examined that urban and peri urban agriculture is a strategy that can be adopted by low income households to meet their food and nutrition requirements. The study discusses the importance of urban agriculture and peri-urban agriculture as a method easily available to low income families residing in informal settlement to access food and incomes. A descriptive and qualitative assessment method was used in order to give an insight of the potential role the sector play in eliminating poverty, enhancing income and creating employment. His finding shows that participation in urban farming can impact significantly on poverty conditions and improve livelihoods. According to Tewodros (2007), Addis Ababa city, revealed that cultivating vegetables crops and rearing large cattle are the most common agricultural activities by the urban crop producers and livestock owners respectively

Research conducted by Armar-klemesu & Maxwell (2000) reveals that Farming is done for three main reasons dependent on the farming type: cash income, food subsistence and assets strategy for emergencies and main issues for urban farmers are land, theft and marketing. Urban agriculture is still missing from municipal planning. Adeoti, Oladele, & Cofie (2011), proved that majority of the male and female farmers indicated that high contribution of urban agriculture to their livelihoods were significant determinants of income from urban agriculture among the respondents. The result of the study by Irene & Esther (2009, shows that there have been strategic innovations related to urban livestock and production in the city of Accra since 1997. Study by Edem (2011), on the integration of urban agriculture into sustainable city development a case study of Accra and Kumasi cities, reveals that urban agriculture makes important contribution to employment, income and food supply.

Urban agriculture as a strategy for poverty reduction in Abuja Nigeria, has become a contemporary issue, gaining prominence especially in developing economies because it has been discovered to be a viable poverty intervention strategy for the urban poor (Ngozi, 2001). The suggestion is to act immediately by integrating UA into the city system in a more viable and sustainable way. This will ensure food security and employment for the urban poor, thus making UA a veritable safety net for poverty reduction. Roseline (2013) asserted that Markets and improved market access are critical for improving urban incomes, particularly in Africa. Despite this, participation of farmers in domestic and regional markets in southwest Nigeria remains low due to a range of constraints. Oyo and Lagos states were randomly selected from the six states in the southwest Nigeria. The data were analyzed using descriptive statistics and Tobit model. The study recommends that governments, non-governmental organizations and other development partners should take a pro-active role in facilitating the formation of smallholder vegetable farmer's organizations and linking them to markets. Researches done in Enugu state by (Iwueke, 2010 & Favour, 2014) on the potentials of urban agriculture proved that sustainable urban agriculture is a positive and appropriate

way of improving urban livelihoods by provision of employment and income. Adedayo & Tunde, (2012) carried out research on “Motivations for women involvement in urban agriculture”, Nigeria and while, Adedeji, ogunjinmi, Yusuf, Obanyi, & Mbonu, (2012) carried out work on “Altitudes of women farmers to Villages urban agriculture” in Somolu Local Government Area of Lagos State, Nigeria.

Urban agriculture in all its ramifications is uniquely popular amongst scholars of diverse disciplines. Thousands of Authors have written on the subject and several thousands have delved intensively on it. In a few cases, urban agriculture may have been the means of the urban poor reaching the middle class, and in some cases, changes may reflect broader growth and improvement in the overall urban economy. But more often this trend appears to reflect a change in access to resources with more powerful urban interests realizing the value of underutilized urban land and the profit of urban production. While these studies are helpful in showing that urban agriculture can have a variety of positive impacts, there are still many gaps in the research so it is relevant to emphasis here that no single author has written comprehensively on urban agriculture in Kwale, Delta State.

STUDY AREA

Kwale (Utagba-Ogbe) is the headquarters of Ndokwa West Local Government Area and is located between latitude 005° 42' 27" N and 005° 42' 40" N and between longitude 006° 26' 02" E and 006 ° 30' 03" E. Figures 1, 2 and 3 show the locational information of the study area.

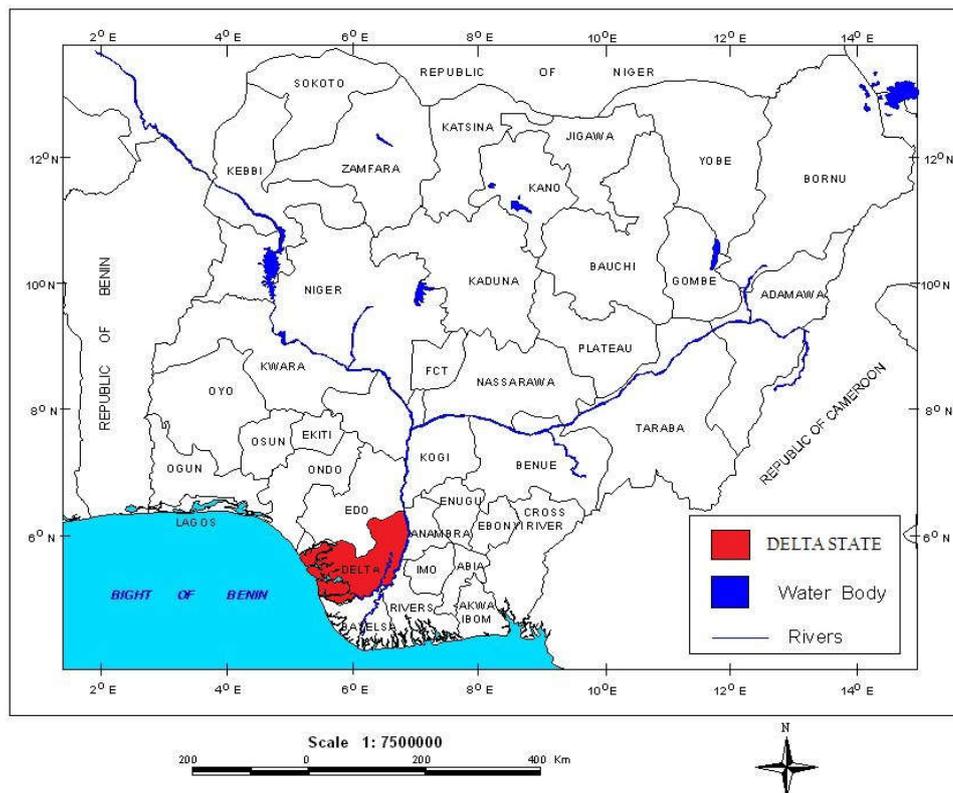


Figure 1: Location of Delta State in Map of Nigeria, Figure

Source: Remote Sensing and GIS Laboratory, Department of Environment Management, Chukwuemeka Odumegwu Ojukwu University, (2016).

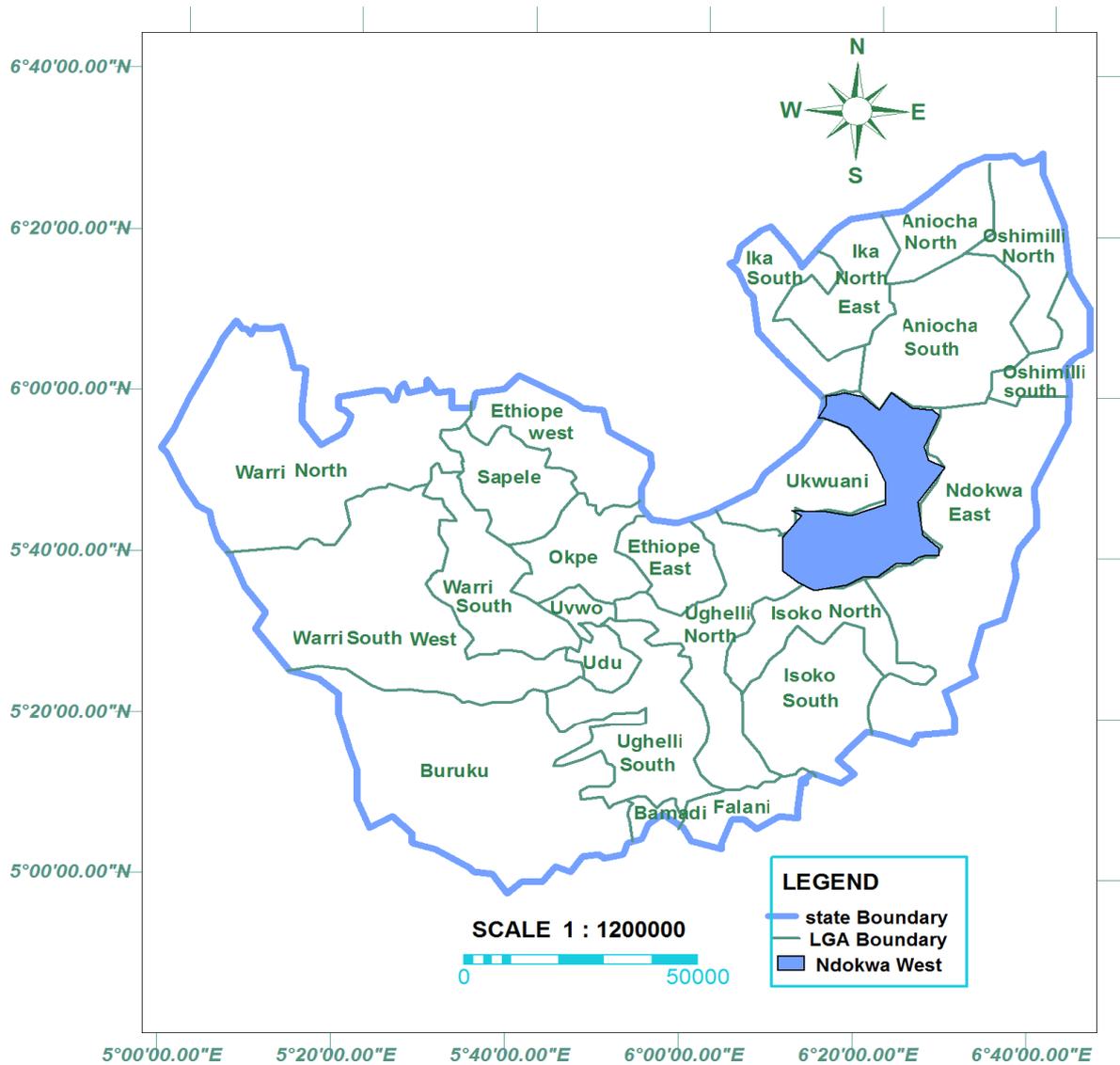


Figure 2: Location of Ndokwa West LGA in Map of Delta State
Source: Ministry of Land and Survey Asaba, Delta State, (2015).

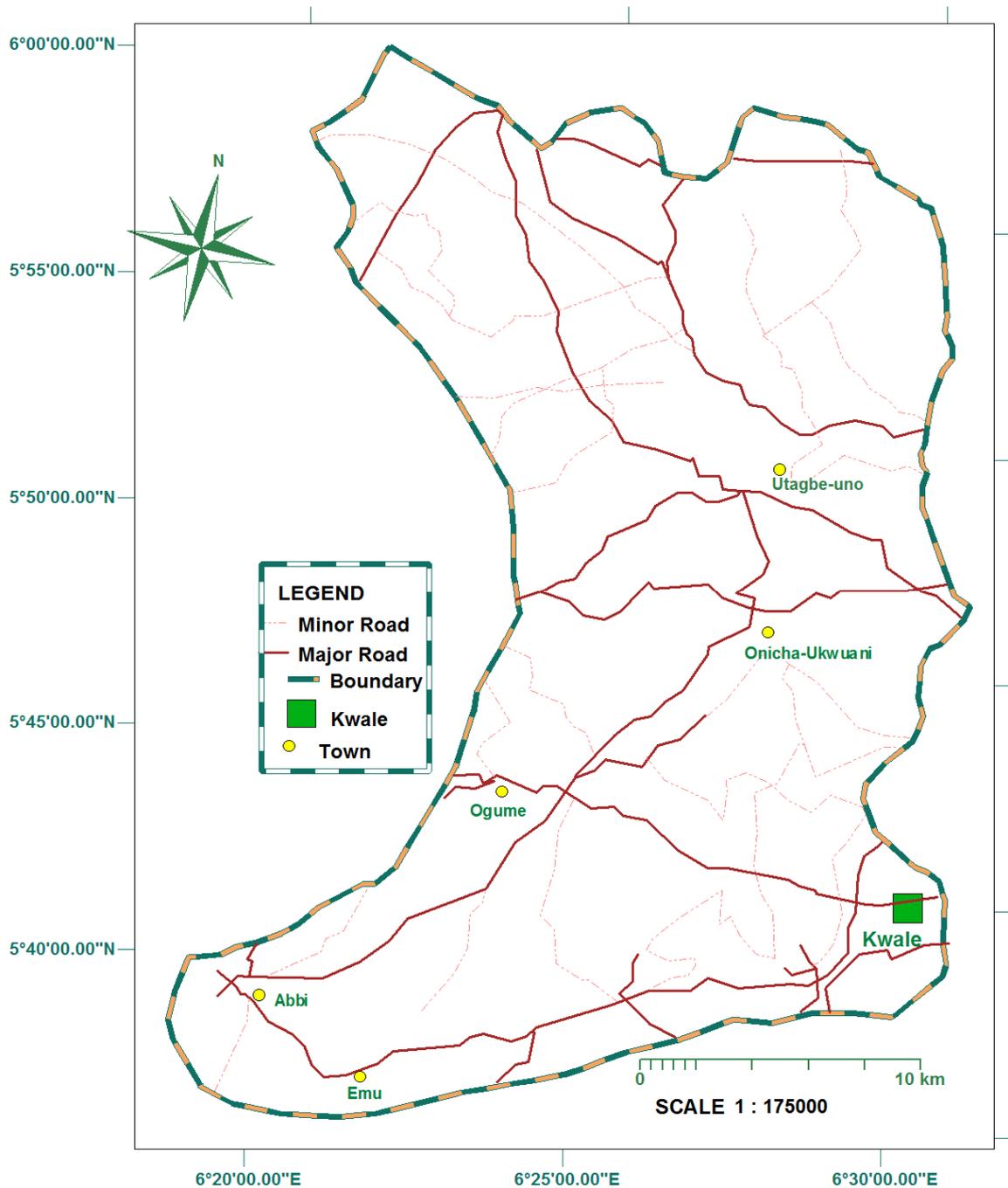


Figure 3: Map of Ndokwa West L.G.A showing Kwale.
Source: Ndokwa West Local Government Council, (2015).

Topographically, Kwale is on a level land (low land) of swamp terrain interspaced by natural lakes and ponds for rich fish harvest. Swamp rice, yams, cassava, maize, melon and plantain. The elevation of this area is about 21m, in the tropical rainforest zone. The average rainfall is 300mm-1700mm annually. Rainfall is highest in July; the average daily temperature is 28-31° C. The study area is in equatorial forest vegetation (secondary bush) ever green forest,

dominated by oil palms, rich economic tress of iroko, Afara, Obeche etc. dominated by alluvial and hydromorphic soil on marine and lacustrine deposit.

According to National Population Commission, the population size of Kwale is 149,325 at 2006 census, with the approved 3.2% annual population growth rate by national population commission (NPC), the population has been projected to be 198,267 in 2015. The study area is the major center for agricultural activity. Many inhabitants are large scale farmers. Those living in communities traversed by rivers and creeks also fish. Rubber and palm oil extraction have been the major source of income. These activities are waning due to falling market prices and migration of young people to major cities. Increased oil and gas production have also reduced the amount of farmland available. However, the area still boasts one of the biggest agricultural fields in the region: the Utagba-Uno rubber plantation currently operated by Mechelin. Kwale also plays host to several multinational oil companies such as Agip, Platform, Midestern, and Sterling global oil companies, etc.

MATERIALS AND METHOD

Relevant data were obtained from both primary and secondary sources. The primary sources include personal interview, field observation, and questionnaires analysis. The secondary sources are books, journals, magazines, newspapers, periodicals, seminar, workshop and conference papers and other documented materials related to the study.

In other to address the objectives set, the researches adopted the survey and descriptive research design. A target population for this study was the population of urban farmers in Kwale, Delta State rather than the urban population as a whole. A two stage sample technique was used for this study. The first stage involves the purposive selection of four towns in Kwale, Delta State. In the second stage, twenty (20) questionnaires were selected for each ward using a simple random sampling technique. Therefore, a sample size of 80 farmers was randomly selected including practitioners of urban and peri-urban farms.

Preliminary survey was carried out which helped to get conversant with the study area, and also to enable the researcher to know the types of crops that is been cultivated. A structured questionnaire with sixty questions was constructed; divided into two (2) sections [A and B]. Section A focused on socio-demographic while section B asked questions on the economic status of the farmers and the role urban agriculture plays for sustainable livelihood in Kwale, Delta State. Eighty (80) copies of the questionnaire were distributed, twenty (20) copies to each of the four (4) town visited in Kwale, Delta State. The questionnaire was administered mostly to respondent above the age of twenty (20). Out of the 80 copies of questionnaire administered, 60 copies of questionnaire were retrieved.

For a more explicit understanding, the data obtained from the study were analyzed using simple descriptive and spearman's rank correlation. The descriptive statistical techniques used include computation of percentage, mean, tables and the hypothesis was tested using the Spearman Correlation Coefficient (ρ).

Table 1: Gender distribution of the respondents

Towns	Male	Female	Total
Umusadege	8	11	19
Umuseti	5	10	15
Umusam	5	9	14
Isumpe	4	8	12
Total	22	38	60
Percentage	36.7%	63.3%	100

Source: (Fieldwork, 2015)

Table 2: Age distribution of the respondents

Towns	20-30	31-40	41-50	51 and above	Total
Umusadege	2	4	6	7	19
Umuseti	1	3	6	5	15
Umusam	3	2	4	5	14
Isumpe	1	5	4	2	12
Total	7	14	20	19	60
Percentage	11.7%	23.3%	33.3%	31.7%	100

Source: (Fieldwork, 2015)

Table 3: Distribution of highest level of education attained

Towns	No. formal education	Primary level education	Secondary/level of education	Tertiary/degree education	Total
Umusadege	0	9	8	2	19
Umuseti	1	7	5	2	15
Umusam	1	5	5	3	14
Isumpe	0	5	4	3	12
Total	2	26	22	10	60
Percentage	3.3%	43.3%	36.7%	16.7%	100

Source: (Fieldwork, 2015)

Table 4: Distribution of employment status by respondents

Towns	Formally employed	Not employed	Total
Umusadage	8	11	19
Umuseti	6	9	15
Umusam	5	9	14
Isumpe	4	8	12
Total	23	37	60
Percentage	38.3%	61.7%	100

Source: (Fieldwork, 2015)

Table 5: Marital status of respondents

Towns	Married	Single	Widowed	Divorced	Total
Umusadage	9	3	5	2	19
Umuseti	7	3	4	1	15
Umusam	5	4	3	2	14
Isumpe	5	3	4	0	12
Total	26	13	16	5	60
Percentage	43.3%	21.7%	26.7%	8.3%	100

Source: (Fieldwork, 2015)

Table 6: Distribution of years of farming experience

Towns	1-5	6-10	11-20	21 and above	Total
Umusadage	2	3	6	8	19
Umuseti	3	4	5	3	15
Umusam	2	3	5	4	14
Isumpe	1	3	3	5	12
Total	8	13	19	20	60
Percentage	13.3%	21.7%	31.7%	33.3%	100

Source; (Fieldwork, 2015)

Table 7: Distribution percentage on farmer's cooperative/ associations

Towns	Yes	No	Total
Umusadage	8	11	19
Umuseti	6	9	15
Umusam	5	9	14
Isumpe	4	8	12
Total	23	37	60
Percentage	38.3%	61.7%	100

Source: (Fieldwork, 2015)

Table 8: Respondents distribution on size of farmland in hectares

Towns	>0.05	0.5	>1	Total
Umusadage	9	7	3	19
Umuseti	7	5	3	15
Umusam	8	4	2	14
Isumpe	7	3	2	12
Total	31	19	10	60
Percentage	51.7%	31.7%	16.6%	100

Source: (Fieldwork, 2015)

Table 9: Major types of urban agriculture practiced

Towns	Crop production	Livestock rearing	Fish farming	Mixed farming	Total
Umusadage	5	4	4	6	19
Umuseti	4	3	2	6	15
Umusam	4	4	2	4	14
Isumpe	2	3	2	5	12
Total	15	14	10	21	60
Percentage	25%	23.3%	16.7%	35%	100

Source: (Fieldwork, 2015).

Table 10 Distribution of respondents on purpose of farming

Towns	Home consumption	Sale / market driven only	Both	Total
Umusadage	3	7	9	19
Umuseti	2	5	8	15
Umusam	2	4	8	14
Isumpe	2	6	4	12
Total	9	22	29	60
Percentage	15 %	36.7 %	48.3%	100

Source: (Fieldwork, 2015)

Table 11: Distribution of respondents on the annual income from farming

Towns	Low	Moderate	High	Total
Umusadage	3	7	9	19
Umuseti	2	5	8	15
Umusam	1	5	8	14
Isumpe	2	6	4	12
Total	8	23	29	60
Percentage	13.3%	38.3 %	48.3%	100

Source: (Fieldwork, 2015)

Table 12: Respondent distribution on contribution of urban agricultural activities on house hold

Towns	Source of additional income	Household Food security	Full time employment	Total
Umusadage	8	6	5	19
Umuseti	6	5	4	15
Umusam	6	5	3	14
Isumpe	3	4	5	12
Total	23	20	17	60
Percentage	38.3%	33.3 %	28.3%	100

Source: (Fieldwork, 2015)

Table 13: Respondents distribution on challenges facing urban agriculture

Towns	Land insecurity	Inadequate capital	High cost of labour	Poor access market	Total
Umusadage	6	5	5	3	19
Umuseti	5	3	4	3	15
Umusam	5	4	3	2	14
Isumpe	4	2	3	3	12
Total	20	14	15	11	60
Percentage	33.3%	23.3 %	25%	18.3%	100

Source: (Fieldwork, 2015)

Table 14: High expenditure on farm input

Towns	Yes	No	Total
Umusadage	11	8	19
Umuseti	8	7	15
Umusam	9	5	14
Isumpe	8	4	12
Total	36	24	60
Percentage	60%	40%	100

Source: (Fieldwork, 2015)

Ho₁: The incomes from urban agricultural activity by practitioner do not have significant effect on their household expenditure.

Table 15: Result of the correlation between practice of urban agriculture and household needs.

		Practice of Urban Agriculture
Practice of Urban Agriculture	Spearman Correlation	1.000
	Sig. (2-tailed)	.
	N	60
Household Needs	Spearman Correlation	.241
	Sig. (2-tailed)	.009
	N	60

Source: (Fieldwork, 2015)

Spearman's rho = 0.241

Significance value = 0.009 ($p < 0.05$, that, significant)

The result shows that a weak positive correlation between Practice of Urban Agriculture and Household Needs. This indicates that as the level of urban agriculture increase, the ability to meet of household needs increases by 24.1%. This level of correlation is low (24%) meaning urban agriculture does not contribute enough to meeting household needs.

Test of significance at 5% level show that the p. value of the correlation coefficient is 0.009 which is less than 5%. Since the p. value (0.009) is less than 5%, we reject the null hypothesis that “The incomes from urban agricultural activity by practitioner do not have significant effect on their household expenditure.” Since we rejected the null hypothesis, we then accept the alternative hypothesis. Thus, the study thus concludes that the incomes from urban agricultural activity by practitioner have significant effect on their household expenditure.

However, based on the low level of relationship between Practice of Urban Agriculture and Household Needs, the study conclude that urban agricultural contributes significantly by minimally to household needs of urban dwellers.

Ho₂: The expenditure on farm inputs and income generated from urban agricultural activity has no significant relationship.

Table 16: Result of the correlation between farm inputs and income generated from urban agricultural activity

		Farm inputs
Farm inputs	Spearman Correlation	1.000
	Sig. (2-tailed)	.
	N	60
income from urban agriculture	Spearman Correlation	.741
	Sig. (2-tailed)	.041
	N	60

Source: (Fieldwork, 2015)

Spearman's rho = 0.741

Significance value = 0.041 ($p < 0.05$, that, significant)

The result show that a strongly positive correlation between farm inputs and income generated from urban agricultural activity. This indicates that as the level of agricultural

(farm) input increase, the income obtained agricultural activity also increased at 74%. This suggest that farm input determines to great extent (74%) the level of income obtained agricultural activity in Kwale urban area.

However, the significance level (0.041) is less than 5%; thus, we reject the null hypothesis that “the expenditure on farm inputs and income generated from urban agricultural activity has no significant relationship”. Since we rejected the null hypothesis, we then accept the alternative hypothesis. Thus, the study thus concludes that expenditure on farm inputs and income generated from urban agricultural activity has significant relationship. This implies that as the level of farm input increases, the income generated from agricultural increases by 74%.

DISCUSSION

This study revealed that most urban farmers in the study area are women and they not only increase food security, they also earn enough income from the practice. On the area of women contributing more to household food security, the result showed that majority is female which accounts 63%. The study further shows that most urban farmers are elderly people and the middle age. Participation in urban farming by young people is infrequent; this can be attributed to lack of knowledge among the youths about the benefits of the practice of urban agriculture. Year of education positively influenced market participation. Urban farmers that are educated are in better position to know the different market channels where their produce can be sold at better price to increase their income. The result from table 3 shows that most respondent had primary /secondary education which accounts 43.3% and 36.7% respectively while very few had tertiary education.

Table 7, reveals that 61.7% which is the majority, did not belong to any cooperative group and this low participation of the respondents in social groups poses serious disadvantage to them because they will be deprived of some benefits. Table 8 reveals that 51.1% has farm size between 0.05 to 1 hectares which implies that majority of urban farmers cultivate small piece of farm land and the size of farmland significantly affect level of market participation. This means that as the urban farmers increases their farm holding, the level of farming increases. The results from table 12, reveals that urban agriculture provide household food, additional income, and full time employment This research has revealed that Kwale, is endowed with a fertile land capable of accommodating series of the agricultural practices. It has been a common knowledge that urban dwellers purchase food to meet all their dietary requirements. Low income earners, widespread unemployment and declining standards of living results in urban dwellers being unable to fend for themselves, they resort to different survival strategies like arm robbery, prostitution & kidnapping.

In an attempt to ascertain the role urban agriculture can play for sustainable livelihood, and food insecurity for urban dwellers, the study revealed that the major benefits derived from urban farming by the respondents were household food supply, income and full time employment opportunity. Urban farming contributed about 74% of the total annual income of the respondents. This shows that it is the major means of livelihood of the respondents. Thus, urban agriculture should be regarded as an integral component in urban income, employment and food systems.

CONCLUSION

This study revealed that most urban farmers in the study area are women and they not only increase food security, they also earn enough income from the practice. Urban agriculture is a sector that can contribute reasonably to employment generation, especially for those who lack the opportunity to join the formal employment sector due to low levels of education. The study shows that food production by urban dwellers has a role of contributing to the welfare of some urban dwellers and assisted in meeting the goal one of Millennium Development Goals (MDGs).

Some challenges impede the achievement of the goals of urban agriculture. The farmers are in a permanent state of insecurity because of the non-availability of agricultural resources such as land and inputs. Farm land is inadequate since most farmers depend on backyard gardens and 'illegal' open spaces. It is about time to give recognition to this veritable strategy for poverty reduction and sustainable livelihood. Programs should be put in place that will result a clearer understanding in appreciation of the practice as an income generation. High incomes deriving from practice can make it attractive to those who are unemployed.

More importantly, governments in many cities and towns in developing countries are beginning to recognize that food production may be an important component of urban food systems and food security. Finally, it was observed that there is a need to continue with the goal one of MDGs even after the expiration of 2015 dead line, because the researcher noted during the urban agriculture studies that the eradication of extreme poverty and hunger would have been a key to addressing other goals of Millennium Development Goals (MDGs) by the developing countries of the world. The practice should be popularized as having potentials to provide employment and possible incomes. This requires a shift of the goal of urban agriculture from being a household food security to one providing food, employment and income through intensification of operations and a focus on the urban food market.

RECOMMENDATIONS

Government as the principal land owner should liaise with individuals and group landowners to devise appropriate mechanisms to release undeveloped plots of land within and around the city for agricultural purposes while retaining their respective right of occupancy. Proper enlightenment campaign should be made and agricultural innovation packages provided by extension agencies to encourage the urban unemployed as well as other interested urban dwellers to channel their resources and energies to agricultural ventures. Such innovation should be geared towards backyard farming, poultry, market gardening, livestock production, fisheries, etc., to ensure proper sustainability. However, awareness on the negative impacts of some agricultural practices to our environment such as the use of some chemicals, bush burning and deforestation should be made known to the farmers. Government should endeavour to supply the farmers with subsidized agricultural inputs such as fertilizer as a means of government support to the sector to provide enough food for the community.

REFERENCES

- Adedayo, A., and Tunde, A.M. (2012): "Motivations for women involvement in urban agriculture". *Nigeria. Asian JOURNAL OF agriculture and Rural Development*, Vol. 2, No. 3, pp.337-343.
- Adedeji, I.A., Ogunjinmi, S.I., Yusuf, A., Obanyi, K.S., and Mbonu, F.T. (2012): "*Altitudes of women farmers to Towns urban agriculture*". Somolu Local Government Area of Lagos State, Nigeria.
- Adeoti, A.I., Oladele, O., and Cofie, O. (2011): "*sustainability of livelihood through urban agriculture*". Accra Ghana.
- Alison, C., Angela, Z., Cassia, D., Micheal, v., and Noah, F. (2014): "*public perceptions of urban agriculture's positionality*". Vancouver, Canada.
- Armar-Klimesu, M. (2000): "*Urban Agriculture And Food Security, Nutrition And Health*". In N. Bakker, M. Dubbeling, S. Guendel, U. SabelKoschella and H. de Zeeuw, eds. *Growing Cities, Growing Food, Urban Agriculture On The Policy Agenda*, pp. 99-118. Feldafing.
- Armar-Klimesu, M., and Maxwell, D. (2000): "Urban Agriculture As An Asset Strategy, Supplementing Income And Diets". In *Growing Cities, Growing Food, Urban Agriculture On The Policy Agenda*, pp. 83–208. DSE, Feldafing. Accra.
- Bakker, N., and Sabel, K., (2000): "*Growing Cities, Growing Food, Urban Agriculture On The Policy Agenda*", DSE, Feldafing.
- Berg, L .van den and Veenhuizen, M. Van. (2005): "Multiple functions of urban agriculture, Editorial". *Urban Agriculture Magazine*, no. 15. December 2005. Leusden, RUAF.
- Berg, L .van den, (2002): "Urban agriculture between allotment and market gardening". *Contributions to the sustainability of African and Asian cities. In C. A. Trebbia, J.F. Martin-Duque & L.C. Wadhwa., eds. The Sustainable City II.* pp. 946-959.
- Cabannes, Y. (2006):" Financing urban agriculture". In R. van Veenhuizen. *Cities farming for the future: urban agriculture for green and productive cities.* Leusden, RUAF Foundation/IDRC/IIRR.
- Calory, L.O. (2010): "*Urban and peri-urban agriculture as a poverty alleviation strategy among low income household*". The case of orange farm, South Johannesburg.
- Cofie, O., A dam-Bradford, A . and Drechsel, P. (2006): "Recycling of urban organic waste for urban agriculture". In R. van Veenhuizen. *Cities Farming for the Future: Urban Agriculture for Green and Productive Cities*, RUAF Foundation/IDRC/IIRR, Leusden.
- Danso, G.K., Drechsel, P., Akinbolu, S.S. and Gyiele, L.A. (2003): "Review of studies and literature on the profitability and sustainability of urban and peri-urban agriculture". *FAO Final Report* (PR 25314), IWMI, Accra. (mimeo).
- De Zeeuw, H. (2005): "Several modules for the training workshop". *Cities farming for the future*.ETCRUAF (internal documents).
- Drechsel, P.; Graefe, S.; Sonou, M.; Cofie, O. O. (2006): Informal irrigation in urban West Africa: An overview. Colombo, Sri Lanka: *International Water Management Institute*. 40.p. (IWMI Research Report 102)

- Edem, K.T. (2011): “*The integration of urban agriculture into sustainable city development*”. A case study of Accra and Kumasi cities.
- FAO (1999): “*Urban and peri-urban agriculture*” a new challenge for the UN Food and Agriculture Organization, by A.W. Drescher & D. Iaquina. Rome. (Internal report)
- FAO. (1996): “Urban agriculture: An Oxymoron” *In the state of food and agriculture*. (Rome: FAO). Pp 43-57.
- Farrington, J., and Carney, D. (1999): “Sustainable livelihoods in practice” *early applications of concepts in rural areas*. ODI - Natural Resource Perspectives, 42: 13.
- Fialor, S. (2002): “*Profitability and sustainability of urban and peri-urban agriculture*” (UPA) in Kumasi. FAO/IBSRAM (IWMI) DAEFM-KNUST Project (PR 17951). Submitted to FAO via IWMI-Ghana. 33 pp.
- Garnett, T. (2000): “*Urban agriculture in London: rethinking our food economy*”. In wN.Bakker, M. Dubbeling, S. Guendel, U. Sabel Koschella & H. de Zeeuw eds. 2000. Growing cities, growing food, urban agriculture on the policy agenda, pp 477–500. DSE, Feldafing.
- Gerstl, S. (2001): “*The economic costs and impacts of home gardening*”. Ouagadougou, BurkinaFaso. Inaugural dissertation zur Erlangung der Wuerde einer Doktorin der Philosophie, vorgelegt der Philosophisch-Naturwissenschaftlichen Fakultät der Universität Basel. Basel, Switzerland. pp. 424.
- Gonzalez, N., Mario, M., and Catherine. (2000): “*Urban agriculture in the city of Havana*” a popular response to a crisis. In growing cities, growing food: urban agriculture on the policy agenda, p. 329-347. DSE, GTZ, CTA, SIDA
- Homem, D.E. and Carvalho, J.L. (2001): “Prove small agricultural production virtualization programme”. *Urban Agriculture Magazine*, No 5. Appropriate methods for urban agriculture. Leusden, RUAF.
- Irene, S., and Esther, N.B. (2009): “*Strategic innovations in urban agriculture*”, food supply and livelihood support systems performance in Accra Ghana
- Iwueke, N.T. (2010): “*The Role of urban agriculture as a means for sustainable livelihood*”. Enugu state, Nigeria.
- Jiang Fang, Yuan Hong, Liu Shenghe and Cai Jianming. (2005): “Multi-functional agrotourism in Beijing”. *Urban Agriculture Magazine*, no. 15. December 2005. Multifunctional use of urban land. Leusden, RUAF.
- Konijnendijk, C.G., Authier, M. and Veenhuizen, R. van. (2004): “*Urban Agriculture Magazine*”, no 13. Editorial. Trees and cities, growing together. Leusden, RUAF.
- Manyong, V.M., A. Ikpi, J.K. Olayemi, S.A. Yusuf, B.T. Omonona, V. Okoruwa, and F.S. Idachaba. (2005): “*Agriculture in Nigeria*” *identifying opportunities for increased commercialization and investment*. IITA, Ibadan, Nigeria. 159p.
- Martin, A. and Oudwater, N. (2000): “*Urban Agriculture and the livelihoods of the poor in Southern Africa*”. In: H. Hoffmann, K. Mathey (eds.). *Urban Agriculture and Horticulture, the linkage with Urban Planning International Symposium*. Berlin. (on cd-rom).
- McCormick, J.S. (1992): “*The Global Environment Movement*”. *Reclaiming Paradise*. London Belhaven.

- Mireri, M. (2002): "Private investment in urban agriculture in Nairobi, Kenya". *Urban Agriculture Magazine*, no 7. August 2002. Economics of urban agriculture. Leusden, RUAFA.
- Mougeot, L.J.A. (2000): "The hidden Significance of Urban Agriculture". Achieving Urban Food and Nutrition Security in the Developing World. IFPRI, 2020 Focus 3. Brief 6 of 10. Washington.
- Moustier, P., and Danso, G., (2006): "Local economic development and marketing of urban produced food".
- Ngozi, E.E. (2001): "*Urban agriculture and food security*". Abuja Nigeria. An Enquiry. Unpublished PHD. Desertification proposal, University of Agriculture Abeokuta.
- Nugent, R. (2000): "*The impact of urban agriculture on the household and local economies*". In: N. Bakker, M. Dubbeling, S. Gündel, U. Sabel-Koschella & H. de Zeeuw, eds., Growing cities, growing food. Urban agriculture on the policy agenda, pp. 67-98. Feldafing (Germany): Deutsche Stiftung für international Entwicklung (DSE).
- Obuobie, E., Keraita, B., Danso, G., Amoah, P., Cofie, O., Raschid-Sally, L., and Drechsel. P. (2006): "Irrigated urban vegetable production in Ghana: characteristics, benefits and risks". (available at www.cityfarmer.org/GhanaIrrigateVegis.html).
- Pingalip, Stamoulisk, Stringer, R. (2006): "*Eradicating extreme poverty and hunger*" to Towns coherent policy agenda, food agric. Org (FAO), Rome.
- Remenyi, J. (2000): "*The contribution that urban agriculture makes to the livelihoods of poor people*". In: H. Hoffmann, K. Mathey (eds.). Urban Agriculture and Horticulture, the linkage with Urban Planning. 2000. International Symposium. Berlin July 2000. (oncd-rom).
- Roseline, J.A. (2013): "*commercialization of urban farming*". The case of vegetable farmers in Southwest Nigeria.
- Smit, J. and Bailkey, M. (2006): "Urban agriculture and the building of communities". In R. van Veenhuizen. 2006. *Cities farming for the future: urban agriculture for green and productive cities*. Leusden, RUAFA / IDRC/IIRR.
- Tewodros, F.D. (2007): "Livelihood Dependence on Urban Agriculture" in Addis Ababa, Ethiopia. MASTER THESIS 30/60 CREDITS.
- UNDP (1996): "Urban Agriculture: Food, Jobs and Sustainable Cities". Vol I. United Nations Development Program One UN Plaza, New York.
- UN-Habitat. (2001): "*The global report on human settlements 2001*" cities in a globalizing world.
- Veenhuizen, R. Van, (2006): "Cities Farming for the Future". Introduction In R. van Veenhuizen. 2006. *Cities farming for the future: urban agriculture for green and productive cities*. Leusden, RUAFA / IDRC/IIRR.
- Yi-Zhang, C. and Zhang, Z. (2000): "Shanghai: trends to Towns specialized and capital-intensive urban agriculture". In N. Bakker, M. Dubbeling, S. Guendel, U. SabelKoschella & H. de Zeeuw, eds. 2000. *Growing cities, growing food, urban agriculture on the policy agenda*, pp 467-476. DSE, Feldafing.