

Environmental and Social Sustainability of Urban And Periurban Agriculture (UPA) In Selected Towns Of Ethiopia

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ABSTRACT:

Today nearly a billion of world population makes their daily bread from UPA, the sector that has received only little attention. This paper tries to assess the sustainability of urban agriculture from social and environmental point of view. The paper used a combination of primary and secondary data. The primary data is collected through questionnaires and structured interview specially designed for this study. About 280 households are selected using proportionate-stratified sampling techniques, the stratification being the size of urban farmers in each of the town. The study shows that the environmental and health aspect of sustainability is closer to the yellow line mainly due to extensive use of chemical inputs. From social and political point of view, UPA is inclined to be unsustainable. Thus, city municipalities and national policy makers have provide the necessary support and grant legal recognition that matches the contribution of UPA to the national economic development.

Key words: sustainability, urban and peri-urban, agriculture, Ethiopia

1. INTRODUCTION

This day the world population is getting rapidly urbanized than ever. At the mid of 20th century, only 30% of the world population were living in urban areas but since 2008, the number of urban population exceed those living in rural area (Hoornweg and Munro-Faure, 2008). This phenomenon of rapid urbanization occurs in all corners of the world but the rate of urbanization is higher in developing countries like Ethiopia. With urban population growth rate of 5.4 percent, Ethiopia ranked the 7th African country with most people living in cities.

Urbanization usually comes with more of complexities than its blessings. Few among the multitude that accompany urbanization are poverty, malnutrition, food insecurity, decrease in urban shelter and security of tenure, backlogs in delivery of basic services, increasing inequality and segregation and degradation of the urban environment. The growing poverty, hunger and lack of formal employment opportunities have stimulated the development of urban agriculture. This form of agriculture that immediately responds to the emerging urban hunger and food insecurity is called Urban Agriculture (UA). There is no simple and single definition to UA or UPA. But more commonly UPA is defined as the practice of food production (it includes the cultivation of crops, vegetables, herbs, fruit, flowers, orchards, parks, forestry, fuel wood, livestock, aquaculture, and bee-keeping) within a city boundary or on the immediate periphery of a city (Gittleman, 2009). With the urbanization process, UPA has become a key element in food security strategies. Two and half decade ago, the UNDP estimated that 800 million people were engaged in

urban agriculture world-wide and 200 million of them were considered to be market producers, employing 150 million people full-time and producing 15-20% of the world's food (Hoorweg and Munro-Faure, 2008). The rapid growth of urbanization caused a boom of UPA in Africa. Denninger et al. (as cited in Egbuna, 2008.) estimated that nearly 25 out of the 65 million people living in urban areas of Eritrea, Ethiopia, Kenya, Tanzania, Uganda and Zambia obtain part of their food from UA and that by 2020, at least 35-40 million urban residents in Africa will depend on UA to feed themselves.

2. PROBLEM STATEMENT

Urban agriculture has been practiced in towns and cities of Ethiopia since time immemorial. The urban-based population is used to keep cattle and sheep, raise chickens, or grew rain-fed crops such as maize and vegetables, on the plots adjacent to their houses. Even in the capital Addis Ababa, there are a large number of households whose lives are associated with agriculture. In 1983, for instance, 17% of the 1,352 surveyed households in Addis Ababa produced their own vegetables or for own consumption (Gittleman, 2009). There are many factors that justify the rationale of urban agriculture in Ethiopian cities: first, prevalence of drought that regularly hit the country and jeopardize food security of the market dependent citizens by reducing the affordability of food prices; Second, lack of efficient transportation system that brings fresh produce from the far rural farms. Thus, the provision of fresh produce locally through urban agriculture is absolutely essential to the food security of urban residents. Besides, UPA has several other direct and indirect benefits to the household and the national economy. Some of the social and economic role of UPA are it contributes to urban food and nutritional security, empowers the urban minority, reduce 'food miles', reduce urban food expenditure, utilize overlooked or neglected resources, provide entrepreneurship opportunity, helps in climate change mitigation and reduce urban violence (Maxwell & Zziwa, 1992; Egbuna, 2008; Maxwell et al, 1998; Hoorweg and Munro-Faure, 2008; Veenhuizen and Danso, 2007).

Despite the glaring fact that UPA plays an important role in livelihood of urban dwellers as well as its indispensable role in urban employment, food security, and poverty reductions, Ethiopian cities/towns administrations and policy makers pay meager attention to the sub-sector in their urban poverty reduction strategy and urban development policy. This is partly due to the lack of sufficient research works that clearly shows the role of and challenges to UPA. Even none of the available research works, at least to the best knowledge of the researcher, assessed the sustainability of UPA as a viable livelihood to urban farmers. Thus, there is apparent lack of empirical research that clearly shows the role of UPA as well as its sustainability in the era of rapid urbanization. This study, therefore, intends to fill the identified gap, by reviewing the role of UPA to households and the local economy as well as to evaluating the sustainability of the practice in central Ethiopia.

3. EVALUATION OF SUSTAINABILITY: LITERATURE REVIEW

Sustainability is a concept that has got wide attention across the horizon. Literally defined, sustainability is the capacity to support, maintain or endure. From agricultural point of view, it is the practice that meets current and

long-term needs for food, fiber, and other related needs of society while maximizing net benefits through conservation of resources to maintain other ecosystem services and functions, and long-term human development (Rao and Rogers, 2006). This definition integrates three main goals of sustainable agriculture: environmental health (environmental sustainability), economic profitability (financial sustainability), and social and economic equity (social sustainability).

Sustainability of a given town's urban agriculture, according to Foeken et al. (2004), can be discussed at two levels: at micro (the household) level and at macro (the town) level. At micro level sustainability refers to the concept of sustainable livelihood. A livelihood is sustainable if it provides basic needs of the household and resists shocks. Sustainable urban agriculture at this level refers first and foremost to the provision of food and/or income in order to maintain a certain standard of living. At macro level, on the other hand, sustainability is only related to the environmental consequences of the practice: farming in town can only be sustainable as long as it does not harm the urban (ecological) environment (Foeken et al., 2004). Although this is certainly important, other aspects are relevant as well, in particular employment creation, the marketing of produce and an enabling legal and policy setting.

Evaluation of sustainability poses more challenge than its definition. This is mainly because most initiatives on agricultural sustainability have been at individual scientist and group levels and there are only limited attempts at developing systematic frameworks (Rao and Rogers, 2006). As a result, different authors or group of scientists used seemingly different criteria to assess sustainability of UPA. For instance Fialor (2002) stated that the access and security of land, yield level, and the prices received per unit of output, and environmental friendly framings determine the sustainability of agriculture. Others adopted the FAO Framework for Evaluating Sustainable Land Management (FESLM) to assess the sustainability of urban agriculture. The lack of standard sustainability assessment criterion led researchers to use varied indicators. Some of the indicators used by different authors are summarized by in van Veenhuizen and Danso (2007). But a close look at the previous studies show that the criteria are boiled down to three elements: Economic and Financial elements, Health and Environmental elements, and Social and political elements. These three elements are adopted by the present study.

4. MATERIALS AND METHODS

This study is conducted in central highlands of Ethiopia with the use of both primary and secondary data. The primary data, which constituted the major input of the study is collected from 280 urban and peri-urban farmers through questionnaires and structured interview. Sampled households are selected using proportionate-stratified sampling techniques, the stratification being the size of urban farmers in each of the town. Based on the size of each stratum, specific households will be selected from each stratum using simple random techniques. Descriptive analysis is made to assess the environmental and social sustainability of UPA in central Ethiopia

5. RESULTS AND DISCUSSIONS

5.1. Descriptive statistics

The survey data showed that the Peri-Urban Vegetable Farmers (PUVF) had varied demographic and social characteristics. The summary statistics presented in Table 2 showed that 87% of the sampled urban farmers are male. This implies that the involvement of male on UPA is significantly higher than the involvement of female. This is against the old and long held belief that UPA is disproportionately dominated by women.

Table 1: summary statistics of vegetable farmers

	mean	min	max	std
Sex (% of male)	0.87			
Age	41.45	24	86	9.583
Family size	4.81	1	11	2.193
Educational level of the farmer	5.93	0	14	3.801
Farm experience	12.33	2	35	7.9

Source: survey result, 2012

The great majority of the UP vegetable farmers (70.4%) belong to the age group above 31-50 years with average of 41.5 years. This implies that UPA vegetable farming is practiced mainly by the adults. This is the expected result because for activities like agriculture, physical strength is very important. The survey data revealed that the family size of the PUVF ranges from 1 to 11, with an average family size of 4.81 (Table 2). This may also attest the view that PUVF is really supporting quite large household members. It is also interesting to note that large majority of the farmers had attended at least primary school (1-8 grades). However, nearly 10 % of the farmers were illiterate, and the other 10% of them has attended basic or adult education. The average farm experience of vegetable farmers is 12.33 years but the range is very high (minimum is 2 years maximum is 35 years).

5.2. Sustainability of UPA

5.2.1. Health and Environmental viability

Environmental and health sustainability is central to the sustainability of urban agriculture. Urban agriculture can only be sustainable if it does not disturb the urban environmental balance. This requires an awareness of the environmental impact of farmers' activities and their willingness to take the environment into account in their farming activities. The prerequisite for Environmental and health sustainability is awareness and understanding of the potential threats to the environment and human health. In the present study, majority (82.3%) of the farmers reported that they have received trainings on environmental issues especially on pollution and soil erosion. The survey also revealed that Development Agents (DA's) are the principal training providers. Large number of farmers reported that beside the DAs, they learn from fellow farmers. Agricultural experts from the district urban agriculture office and health extension officers provide pollution related information to urban farmers.

Table 2: summary of farmer's awareness on environmental impact of UA

	Frequency	Percentage
Received trainings on environmental conservation	223	82.3
Feel that UPA has Negative Environmental impact	50	18.2
Feel that UPA has positive impact to the Environment	129	48

Source: survey result, 2012

Farmers knew that use of chemical inputs is dangerous to the environment and human health. Interestingly, only 20% of them use pesticides and herbicides. But almost all farmers reported that are using chemical fertilizers all the times. Many of those not using chemicals in urban crop cultivation did not refrain from doing so because of an awareness of the damage they might cause to the environment but because of a lack of money (financial resources). Moreover, those farmers who have received professional technical assistance also used chemical inputs more often, indicating that extension officers were strongly promoting the use of chemical inputs. This is due to a strong push from the government side to sell as many inorganic fertilizers as possible. Usage of manure was less practiced as only 40% of the farmers apply it. Accessibility to unpolluted water and efficiency in its use determines the productivity and sustainability of UPA. In the present study the use of polluted water was not a serious problem in all the three towns because most of the farmers use river (59%) and rain (38%) water for their vegetable farm. Discussion with the focus group revealed that the common practice among many farmers is to start with rain water during the summer and finish it with river water (irrigation).

This study revealed that the environmental sustainability is closer to the yellow line mainly due to extensive use of chemical inputs. The use manure for vegetable farming should be promoted more extensively. The government has to revise its goal of raising large revenue via excessive sale of inorganic fertilizers. The extension officers should also play a role in training farmers on easy way of preparing compost and other organic fertilizers. First, however, they will have to be trained to encourage environmentally friendly farming, given for instance our finding that, at the moment, they apparently tend to promote the use of chemical inputs instead of organic inputs.

5.2.2. Social and political Viability

The social and political acceptance determines the sustainability of every activity or business or project. Same is true for UPA. Sustainability of UPA from political and social point of view were assessed by many researchers with varied number of yardsticks to assess. The major issues considered were land security, access to credit facilities, access to extension services, capability/right to establish association.

Secured access to land is usually considered essential for sustainable urban agriculture because clear property rights determine producers' willingness to invest. In the study areas, most of the farmers farm their own lands and the farmers are no feeling any risk of eviction (at least in the short run). In all the three towns, more than 90% the plots

for vegetable production were either owned by the cultivator or by his/her relatives. So access to land seemed to be ensured for the majority of the cultivators and farmers would make long-term invest on their land because of low risk of eviction. But discussion with focus group discussion, however, revealed that urban agriculture is always under risk of eviction. This is mainly due to continuous lateral expansion of towns that demands per-urban lands for residential or other constructions. Obviously, construction project has a stronger financial lobby than urban farming and the vegetable farmers are not fully secured of their land.

Furthermore, urban agriculture is often seen by many municipalities as an informal or rural activity that goes against the image of modern civilization and progress. Health authorities lobby against irrigated urban farming on the ground that they are using polluted water sources. As a result, UPA lacks the necessary political attention which in turn leads to denial of some services such as suitable land and tenure security.

Product market is easily accessible to vegetable farmers. The survey revealed that farmers have several alternative market places and access to each of these markets is very easy. Though farmers can sell their products at own farm or own home, farmers prefer town markets because they feel that better price can be offered to their product at town markets than other places. As a result, 62.5% of the farmers sell their vegetable products at town market. while only 21.7% of them sold at own farm. The focus group discussion also revealed that there are some farmers who supply their products directly to the central market.

Pricing system is also another important issue in marketing. How price is set and the bargaining power of farmers has got something to show about the sustainability of UPA. Most often than not, price of agricultural products are mainly set by the market. This study confirmed the same situation in that 86.4% of the farmers reported that market plays leading role in setting the price of vegetable products.

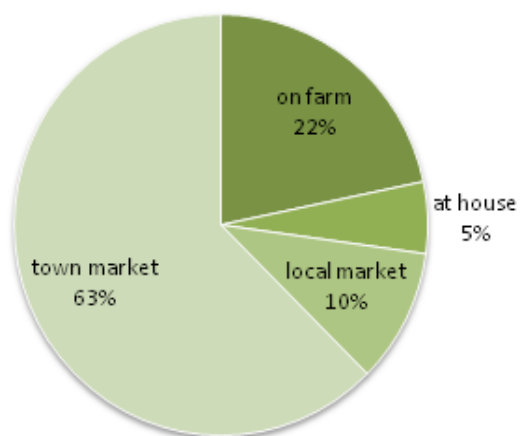
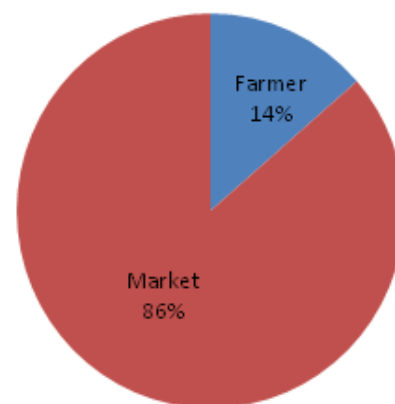


Figure 1: (a) Marketing places of UPA Vegetable products price setting



(b) share of market participants in vegetable price setting

UPA requires financial support if it is to continue developing as a productive force. In the present study, credit seems hardly accessible to most farmers in that only 30% of the sample farmers reported that have access to credit facilities. But the number of farmers who actually benefited from the credit facilities was lower. During 2011/12, for instance, only 61 farmers have received credit. This amounts to 22.2% of the whole sample or 76.6% of those who have credit access. The major credit providers in the study area are Micro Financial Institutions (MFI) such as is Oromia Credit and saving Association (OCSA) Liyu and Wisdom. The survey revealed that together, the former two MFIs provide credit to 80% those farmers who got credit in 2011/12. From the preceding discussions, it is evident that the credit facilities are less accessible to UPA farmers. According to the survey data, lack or inadequate number of credit providing institutions is the major problems in credit facility. Even the accessible ones are less attractive due high interest rates, group collateral system and timing problems.

Extension service included training, educational programming, communication and community organization. These services are important to all farmers regardless of their location as urban or rural. The present study revealed that nearly 91% of the farmers selected from the suburbs of the three towns have received technical advice on their vegetable production. The service providers are mainly experts such as DA (88%). In the absence of DA farmers seek advice from fellow farmers (neighbors, family members or relatives). This is because farmers knew that technical advice would improve their efficiency and profitability.

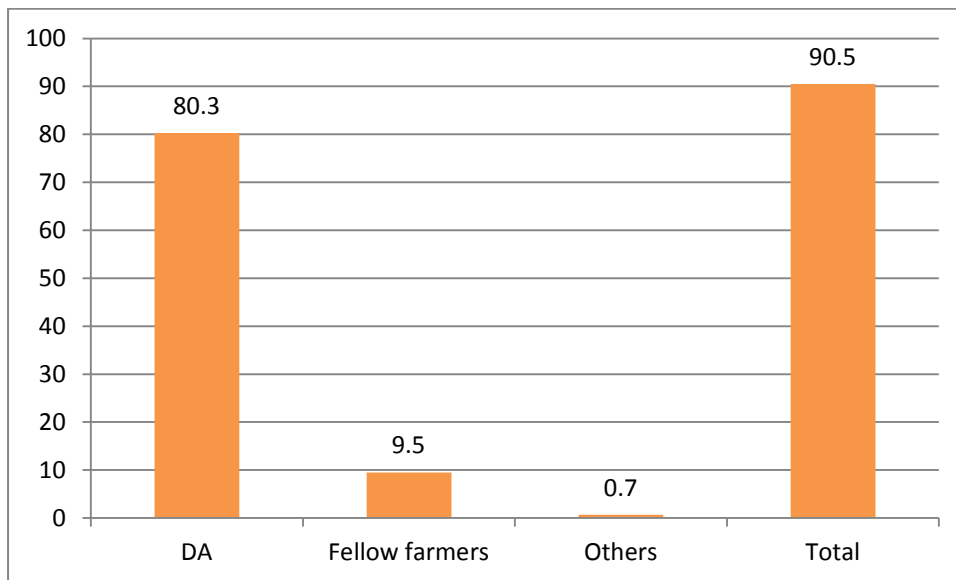


Figure 2: Primary technical advisor of the vegetable farmers

Many of the present day farmers 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. Marketing of co-operative societies can effectively address marketing problems, thus enhance the profitability of urban farming. The survey data however showed that there is no vegetable farmers association in all the study areas. More than a quarter of the vegetable farmers are members to one or more of social institutions such as 'Uqubi', and

‘Idiri.’ Idiri is an institution established by villagers dedicated to help the members of the group during emergencies, such as death. The members also raise funds that will be used during such emergencies. On the other hand, Iquib is (often informal) institution established by relatively small group of people in order to provide substantial rotating funding for members in order to improve their lives and living conditions (Ayele, 2003). These local institutions are more of (traditional) financial associations than producers’ associations and hence none of them have any objective of improving or safeguarding the benefit of farmers from vegetable production.

6. CONCLUSION AND RECOMMENDATIONS:

UPA plays an indispensable role in the lives of many Ethiopians. Though dubbed by some city municipalities as informal and even sometimes as illegal activity, UPA continues to support hundreds of thousands of families throughout the country. But the assessment of its sustainability as a viable livelihood strategy shows mixed results. The economic and financial viability of UPA is encouraging. On average, each farming household earned an annual profit much greater than the annual salary of public servant. It also proves to provide food to the farming household as well as urban community. It has really shown that it plays a significant role in providing fresh and nutritious product to urban community, in generating income to the household and creating employment opportunities to the community. The environmental and health aspect of sustainability is closer to the yellow line mainly due to extensive use of chemical inputs. Though farmers are aware of the negative impact of using such inputs, the ardent need of higher productivity both from the farmer and the government led to the intensive use of the chemical inputs at the expense of the environment and human health. In this aspect, therefore, the sustainability of UPA is at stake. The use manure for vegetable farming should be promoted more extensively. The government has to revise its goal of raising large revenue via excessive sale of inorganic fertilizers.

From social and political point of view, UPA is inclined to be unsustainable. Covertly, land security seems granted for all UPA as nearly all of them are farming their own land. But urban farmers are always under the risk of eviction as the construction project has a stronger financial lobby than urban farming. Credit facilities are hardly accessible to most farmers mainly due to inadequate number of credit providing institutions. Even the accessible ones are less attractive due high interest rates, group collateral system and timing problems. Lack of farmers’ associations and marketing cooperative societies is also another problem. As a result, UPA lacks the necessary political attention which in turn leads to denial of some services such as suitable land, tenure security, and credit facilities. Thus, city municipalities and national policy makers have to improve the land security and have to arrange the credit facility that meets the special need of these urban farmers. Furthermore, the government has to encourage the establishment of farmers’ associations and marketing cooperative societies. Above all, it has to provide legal recognition that matches the contribution of UPA to the national economic development.

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