

Urban farming and its potentials for waste recycling

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Abstract

Cities in Nigeria are generating increasing volume of wastes which are usually dumped in open landfills or into water bodies. These practices pose very serious risk and threat to public health and the environment coupled with expensive amount of money involved in waste disposal. This study however examined the practice of urban farming and identified the strategies adopted by farmers in organic waste management. Through the multi-stage sampling technique, 60 urban farmers were identified and sampled with the aid of questionnaire. Data were analyzed using table and histograms. Result of the analysis revealed that urban farming was practiced on subsistence level as small holdings of farmland averaging 89.6m² were cropped by farmers. Results also showed that urban farming was dominated by women who had intermediate education. Findings further revealed that considerable amount of wastes were generated and utilized by farmers on the farms. Results underscore the need to include urban farming in urban planning and development policies as a suitable urban greening strategy. Policies should also be formulated to provide cultivable land for urban farmers to encourage the expansion of production.

Keywords

Urban, Farming, Organic, Waste

1. Introduction

Urban agriculture is an industry located within (intra-urban) or on the fringe (peri-urban) 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 urban areas and in turn supplying human and material resources, products and services largely to urban areas (Mougeot, 2000). Depending upon the local context, in some city areas it may be labeled as 'urban gardening' rather than 'farming' or 'agriculture'. These words can be used interchangeably. Urban agriculture is not limited to the production of agricultural and horticultural crops, but may also include forestry, floriculture, aquaculture and livestock production. Throughout the globe, agriculture is increasingly a part of city landscapes (Bourque, 2000) and city farming is one of

the strong and positive activities urban residents are undertaking in an effort to take control of food security, social ills and environmental degradation in their communities (Mougeot, 1994; UNDP, 1996; Udoh and Etim, 1998). The nature of urban production sites and the opportunities and constraints faced by urban farmers narrow down the choice of crops (Shackleton *et al.*, 2009). In general terms, the characteristics of urban production systems are limited space and high land value, close proximity to markets and, in most cases, proximity to farmers, although some commute to pockets of farmed land within the city, with uncertain tenure when using public land. Risk of theft or vandalism is also high in some places. However, these features may not be clearly experienced by all individual farmers, as some may have access to more land than they can handle.

One of the favourable practice and main beneficial impacts of urban agriculture is the potential to recycle urban waste products. According to Bakker *et al.* (2000), organic waste such as waste from harvested agricultural produce, animal manure and household kitchen waste are popularly used as compost (Etim, 2008). Shackleton *et al.* (2009) also reported that recycling of urban waste products to agriculture includes organic household waste, human urine and excrete, animal manure, wastewater, ashes and industrial organic waste. These materials may be applied directly or pre-treated in some way (e.g. by composting). Cities have large nutrient surpluses due to the import of food (Khai *et al.*, 2007), with the main outputs being via waste disposal in the worst cases via (natural water bodies) or accumulation within the cities themselves. The huge nutrient surplus in cities is not only a challenge for the waste handling facilities and the surrounding environment, but also an opportunity for urban farmers. Rabinovitch and Schmetzer (1997) documented that urban farming uses agricultural methods that make the most of scarce land, water and other natural resources and often makes use of household waste. According to UNDP (1996), biological waste contributes to natural resource conservation, turns waste from a problem into a resource, reduces the public cost of waste management as the private sector gets involved and provides a better living environment, especially in areas not receiving waste management services.

Etim and Edet (2014) reported that Akwa Ibom State has witnessed unprecedented, uncommon and massive infrastructural development and transformation within the past decade. And this has led to astronomical influx of rural dwellers into urban areas. As urban population increases, the amount of waste generated increases correspondingly and the capacity to absorb these wastes becomes more complex. Empirical study by Etim and Ofem (2005) suggests that since growing food on urban lands requires biodegradable household waste and recycled materials as a suitable soil augmenting and replenishing ingredient, urban and peri-urban agriculture provides an option for efficient waste disposal and utilization in urban areas. This study was therefore conducted to examine the waste management strategies by urban farming households in Akwa Ibom State.

2. Methodology

This study was carried out in Uyo Local Government Area of Akwa Ibom State. Uyo is situated 55 kilometres inland from the coastal plain of Southern Nigeria. The area is located on Latitude 05°35'N and Longitude 07°56'E. It covers an area of approximately 35km². It is bounded on the South by Ibesikpo Asutan, North by Itu, West by Abak and East by Uruan. Uyo Local Government has an estimated population of about 309,573 people. Uyo comprises four clans namely, Oku, Etoi, Offot and Ikono. It has 2 distinct seasons viz: the rainy season and short dry season and is located within the humid tropical rainforest

zone. The annual rainfall ranges between 2000 – 3000mm.

2.1. Sampling, Data Collection and Analytical Technique

Multi-stage sampling procedure was employed to select the representative urban farming households. The first stage involved the random selection of two clans. The second stage involved the selection of 30 urban farming households to make up 60. Data on output, plot size, socio-economic variables and quantity of waste generated were obtained with the aid of questionnaire. Data were analyzed using table and histograms.

3. Results and Discussion

Table 1. Summary Statistics of Variables.

Variables	Unit	Mean	Range
Output	Kilogram	20.5	10.4 – 52.8
Land	Square meters	89.6	72.4 – 124.2
Education	Years	8	2 – 12
Age	Years	30	12 – 48
Household Size	Number	6	1 – 10
Family Labour	Mandays	94.4	80.6 – 163.4
Experience	Years	21	12 – 30
Organic waste generated	Kilogram	5.4	3.7 – 12.2

The average farm size was 89.6m². This is an indication that production was on small holdings of farmland. This may not be unconnected with the prevalent tenure arrangement in Niger Delta Region of Nigeria which encourages fragmentation of land. Finding is in conformity with earlier reports by Etim and Okon (2013); Etim and Edet (2013). The fact that the average years of schooling were 8 years is an indication that urban farmers had intermediate education. Most of the labour provided for farming was from family members and the mean family labour provided was 94.4 mandays. The average quantity of waste generated per household was about 5.4kg. This is an indication that considerable quantity of waste was generated and utilized by farmers.

4. Socio-economic Characteristics of Urban Farmers

Figure 1 shows the distribution of urban farmers by gender. Most (58.3 percent) of the farmers were women whereas only 41.7 percent were men. The gender distribution of urban farmers is variable from city to city. However, this result revealed that women dominate urban farming. Result is consistent with earlier empirical works by Drescher (1996); (1999) in Lusaka; Sawio (1994) in Dar es Salaam; Maxwell *et al.* (1998) in Kampala and Hovorka and Lee-Smith (2006). These studies show that women dominated all parts of the urban production cycle including farmers, middlemen and traders at markets. Contrary to the above situations, a number of studies have demonstrated that urban farmers are predominantly men. Ashebir *et al.*

(2007) in a study from Mekelle (Ethiopia) and, Ezedinma and Chukuezi (1999) in Nigeria found that urban vegetable and ornamental production were male activities.

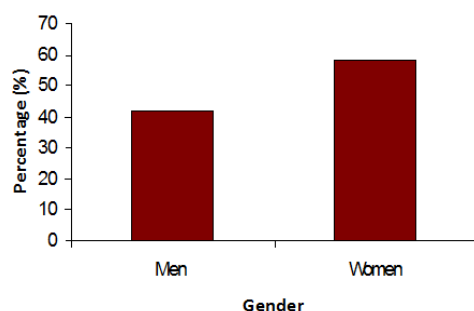


Fig. 1. Gender of urban farmers.

The age distribution of urban farmers revealed a varied picture but with a dominance of elderly and few young farmers. Figure 2 shows that about 63 percent of urban farmers were within the age range of 41 – 60 years whereas few young people aged 1 – 20 years comprised 11.67 percent of farmers. This implies that most urban farmers were within active and productive population. Finding is synonymous with earlier empirical works of Simon *et al.* (2004) and Shackleton *et al.* (2009).

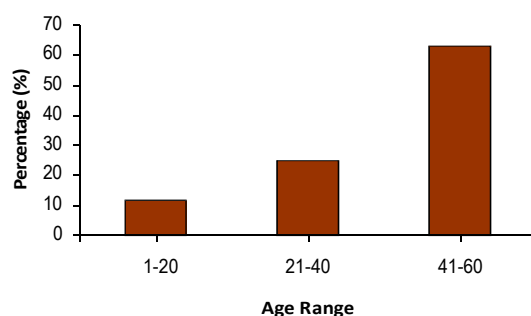


Fig. 2. Age of the urban farmers.

With respect to educational background, few farmers had primary and tertiary education. Most (63.33 percent) of the farmers had secondary education. The result contrast with findings by Ezedinma and Chukuezi (1999) in Nigeria and Ashebir (2007) in Ethiopia who found that most urban farmers were poorly educated, but synonymous with Madaleno (2000) in Brazil who reported that most urban farmers had intermediate education.

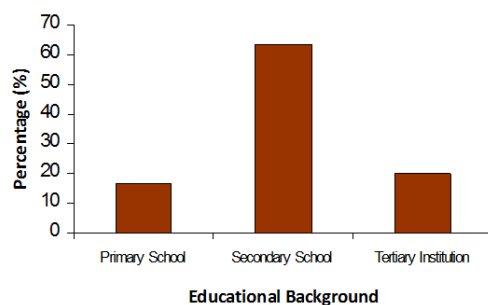


Fig. 3. Educational background of urban farmers.

With respect to income generation from selling farm products, it was difficult to quantify the amount of money realised due to the ad hoc nature of urban farming and the reluctance or hesitance of farmers to reveal their income. Similar empirical experiences were reported by Bryld (2003) and Drescher (1996). However, the naira worth of farm produce consumed at home was found.

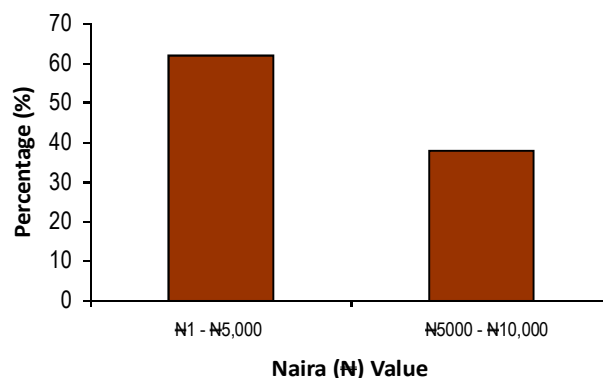


Fig. 4. Naira worth of output consumed at home. (1 US \$ = ₦170)

Figure 4 shows that most urban farmers saved less than ₦5, 000 by consuming farm produce at home. Finding conforms to earlier empirical report by Etim (1998).

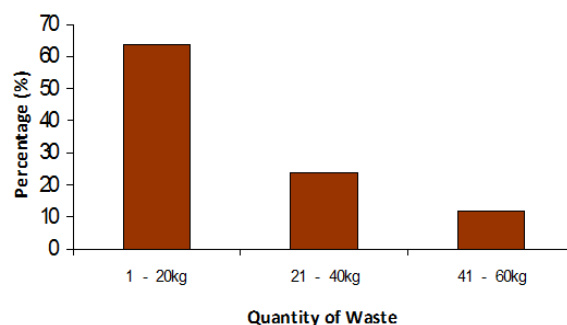


Fig. 5. Quantity of waste generated & utilized.

Figure 5 shows the quantity of organic waste generated and applied on the farm. Majority (64 percent) of the farmers generated and utilized 1 – 20kg of waste whereas 24 percent and 12 percent generated and applied 21 – 40kg and 41 – 60kg of organic waste. Etim (1998) obtained similar finding.

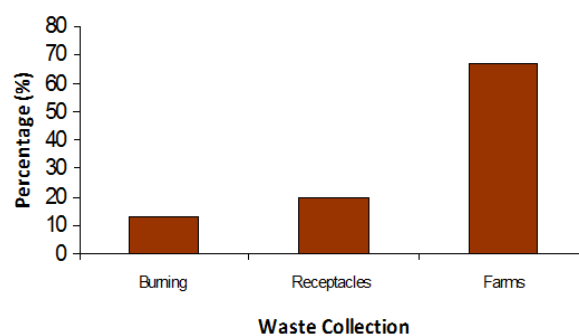


Fig. 6. Waste Collection and Disposal Technique.

Figure 6 shows the different waste disposal methods. About 66.67 percent of urban dwellers applied waste on farms whereas 13.33 and 20 percents of respondents burnt and disposed waste through receptacles. Findings imply that respondents applied waste mostly on farms. Result is synonymous with earlier empirical findings of Kaseva and Gupta (1996) and Korner *et al.* (2007) who found that about 60 percent of wastes were applied on farms since it contained substantial amount of organic materials.

5. Conclusion

This study analyzed urban farming and organic waste management strategies adopted by farmers. Results of the study indicated that urban farming was practiced on small holdings of farmland as the mean plot size was 89.6m². Findings also revealed that considerable quantity of waste generated was applied on the sampled urban farms, implying that organic waste was recycled on the farms. Results of this study also showed that women dominated urban cultivation. Results underscore the need to include urban farming in urban planning policies as a suitable urban greening strategy. Appropriate land policies should be put in place to provide adequate land for urban cultivation.

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