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Environmental risks of urban agriculture in the Lake Victoria drainage basin: A case of Kisumu municipality, Kenya

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Abstract

This paper examines the environmental risks threatening sustainable urban agriculture in Kisumu municipality. The issues covered in the paper are: review of policy and institutional framework, infrastructure and service delivery, pollution analysis of irrigation water and crops and urban agriculture waste management. In addition, the paper proposes measures for sustainable urban agriculture. Household survey and pollution analysis of irrigation water and crops (kales and yams) were conducted in the study area. To capture spatial distribution of farmers in the municipality, the municipality was stratified into four strata and in each stratum a combination of stratified-systematic-simple random sampling was used to sample 194 households. Structured household questionnaire was administered to the sampled households.
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Keywords: Urban agriculture; Environmental risks; Pollution; Kenya

Introduction

Kenya has witnessed rapid annual rate of urbanisation (about 6%) since independence in 1963. The independence guaranteed people freedom of movement, which spurred high rate of rural urban migration. Against the rapid urban growth the country has registered deteriorating institutional and physical infrastructure. As a result, Kenyan urban centres are characterised with expansive informal settlements; poor water and sanitation infrastructure and services. Also, the 1990s ushered in increasing incidences of poverty, a situation that threatens to heighten in future. Currently, over 60 of Kenyans live below poverty (Mireri, 2006).

Although there are different definitions of urban agriculture, the following key features characterise the activity: (1) urban agriculture involves crops and livestock production, but it may also include agro-forestry and fuel production; and (2) urban agriculture is practised both within the urban boundary and its periphery. Agriculture remains a key feature of the urban land use system. Most of the urban areas remain

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predominantly rural in nature where agriculture dominates the landscape, for example 80% of Kisumu municipality is rural in character. Poverty situation in the municipality has deteriorated during the last two decades rising from 37% to 60%. About 90% of the municipality rely mainly on pit latrines for the disposal of human waste with serious risk of water and soil contamination. Also, the municipality suffers from malfunctioning sewerage system, which is a potential source of environmental pollution. In addition, the municipality does not have a functioning solid waste management system. These factors exemplify the potential sources of environmental degradations, which threaten the viability of safe urban agriculture.

This paper examines the environmental risks associated with urban agriculture and the problems associated with the management of urban agriculture waste. Finally, the paper attempts to highlight the plausible measures for safe and productive urban agriculture.

Research methodology

This paper has made use of both secondary and primary data. Primary data has been obtained from a sample of 194 households, irrigation water analysis (100 samples), yams (16 samples, kale (16 samples), focus group discussions, resource persons and field observation. Structured household questionnaire was administered to each sampled household. Pre-survey was conducted to gain insight on the study area, recruit and train research assistants, test the household questionnaire and refine research instruments. Urban farmers were sampled using a combination of stratified-simple-random sampling as well as systematic random sampling. The municipality was stratified into the following four spatial units based on the main roads. The confluence of all the major roads as shown in Fig. 1 below is the town centre. The stratification was arranged along the main roads to ensure that the whole municipality is covered in the survey. Each spatial unit covered both the planned and informal settlements as each sampling area originate from the town centre. The planned settlements cluster around the town centre while further away from the town centre is predominantly informal settlements. The planned settlements are inhabited mainly by immigrant workers, while the occupants of informal settlements are both the indigenous settlers and immigrants workers. Thus, both indigenous and immigrant farmers were captured in the sample. The indigenous inhabitants who are engaged mainly in subsistence farming have been engulfed by urban growth and are exposed to increasing incidence of urban poverty. The immigrant workers occupy almost exclusively the planned settlements in addition to the cheap rental housing in the informal settlements where they reside together with indigenous inhabitants. Informal settlements accommodate about 60% of the urban population. There are two general categories of immigrant

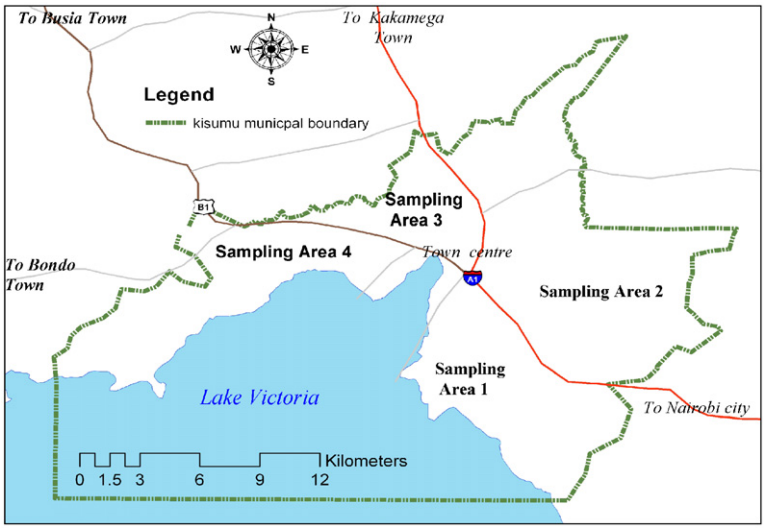

Fig. 1. about here: Kisumu municipality and the sampling areas.

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