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FARMING IN THE CITY
AN ANNOTATED BIBLIOGRAPY
OF URBAN AND PERI-URBAN AGRICULTURE IN UGANDA

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Urban Harvest is the CGIAR systemwide initiative on urban and peri-urban agriculture, which aims to contribute to the food security of poor urban families, and to increase the value of agricultural production in urban and peri-urban areas, whilst ensuring the sustainable management of the urban environment.

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Urban Harvest Annotated Bibliographies on urban and peri-urban agriculture contain a list of citations from articles, books, documents, theses and reports followed by an annotation or brief description. The material has been selected from a variety of sources and disciplines on urban and peri-urban agriculture in order to motivate interdisciplinary discussion and comment. The author(s) alone is (are) responsible for the content.

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INTRODUCTION

Kampala, the capital city of Uganda, has a population of approximately 1.2 million inhabitants. Kampala in the 21st century is the showcase of Uganda's economic, political and social transformation from the civil war and economic decay of the late 1970s and 1980s. Urban agriculture is widely practiced, both within the municipal boundaries and peri-urban areas. Despite its pervasiveness in Uganda, agriculture in cities has been technically illegal since the colonial times. Thanks to the collaborative efforts between international, national and local organizations, new ordinances have now been brought into force, which legalize and formalize urban agriculture in Kampala.¹

Urban Harvest (previously known as the Strategic Initiative on Urban and Peri-Urban Agriculture (SIUPA), a CGIAR system-wide initiative convened by the International Potato Center (CIP) in 1999, operates in three African cities: Yaounde, Cameroon; Kampala, Uganda and Nairobi, Kenya. The Uganda project, entitled "Strengthening urban and peri-urban agriculture in Kampala", coordinated by the International Center for Tropical Agriculture (CIAT), seeks to characterize and diagnose three aspects of urban farming systems: livelihoods, production systems and market opportunities. The project also supports action research on the provision of extension services and seed by schools. The project's overall objective is to generate information that will assist local authorities, policy makers, NGOs and researchers to promote and make informed decisions and interventions in this sector.

An important first step in documenting the practice of UPA in Uganda is a compilation of existing literature, hence this annotated bibliography. A significant literature exists on UPA in Uganda focusing on five major aspects: agricultural production (crops, livestock, forestry/agroforestry), UPA's contribution to food security and nutrition, land use, environment and policy issues. The literature on UPA developed in the 1990s following the political and economic upheavals of the 1980s and therefore provides little historical perspective of this phenomenon. Much of the information on UPA exists as gray literature, unpublished reports and papers, but a number of MA/MSc and PhD theses have focused on UPA. This literature is often inaccessible as it is usually difficult to gain access to unpublished documents. To alleviate this problem, SIUPA-Kampala set up a collection of publications on UPA that is housed at the CIP office in Naguru. This bibliography indicates where all entries are located.

This document contains 51 entries obtained by visiting over 13 major research libraries, NGOs and government institutions. It is very much a work in progress as the literature on UPA is rapidly expanding. I hope that you will find this compilation useful.

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May 2005

¹ Many of the entries and annotations were written prior to the change in the law on agriculture in Kampala

ASSESSMENT OF URBAN AND PERI-URBAN AGRICULTURE

Byaruhanga, J. 1996. Agricultural practices in urban setting in Walukuba Zone, Jinja Town. Unpublished BA thesis, Department of Geography, Makerere University, Makerere, Uganda. (8)*

Key words: urban agriculture, urban planning, environmental health

The study attempts to explain why urban agriculture continues to persist in urban centers and evaluates the benefits obtained from urban agriculture. Secondary and primary data were collected using structured and unstructured questionnaires and key informant interviews.

Findings indicate that the practice of urban agriculture is not consistent with urban planning and violates urban bylaws. The study discusses how urban agriculture has caused environmental degradation. It shows how poverty and low incomes greatly contribute to the persistence of urban agriculture, since it is practiced as a survival strategy, which is mainly done by women. The study therefore recommends the integration of urban agriculture into urban planning, thus legalizing it because of the important role it plays for the urban poor.

Egziabher, A., D. Lee-Smith, D. Maxwell, P. Memon, L. Mougoet, and C. Sawio. 1994. *Cities Feeding People: An examination of urban agriculture in East Africa.* Ottawa: IDRC. (2)

Key words: urban agriculture, socioeconomic analysis, rural-urban linkages, crop production

This study was carried out in five countries: Tanzania, Ethiopia, Uganda, Kenya and Malawi. It challenges the assumption of economic development theorists, Marxists, and modernists who see urban agriculture as the inappropriate retention of peasant culture in cities and confidently predict its disappearance. The research also challenges development planners who perceive a dichotomy between rural and urban, between agriculture and cities and assign food production solely to rural areas. The study therefore emphasizes the need to recognize urban agriculture as an important part of the informal sector because it provides income or income substituting food to a significant number of urban residents.

* Code for location of entries, see p. 33.

Findings indicate that in Kampala 50% of the land is farmed by about 30% of the total population and 70% of the poultry and eggs eaten in the city are produced there. About 20% of tuber crops grown in the city is consumed by growers and the rest is sold off.

Land holding patterns are extremely confusing in Kampala as traditional land rights are contested against modern land-user rights. Many landowners work out arrangements with urban farmers to use land they are holding until land settlements are concluded so as to prevent unauthorized squatters from occupying it.

Ssemwanga, M. A. 2002. An overview of urban agriculture in Kampala City. Paper presented at SIUPA-Kampala planning workshop, at Kampala, Uganda. (6)

Key words: urban agriculture, policy, urban planning, homegarden

The paper reviews the challenges faced by Kampala City local authorities to plan and provide basic needs and services to the city's increasing population. It observes that urban and peri-urban agriculture has sprung up in recent years due to socioeconomic factors. UPA is being affected by legislation inherited from the colonial period that either technically prohibits, or sets limits on the types of crops that are zoned where tolerated.

In Kampala City Council (KCC) the urban agricultural sector (crop, livestock services and fisheries) falls under the Department of Gender, Welfare and Community Services. Issues related to policy and planning are handled at the city level, while implementation of activities is the responsibility of divisional governments.

Besides contributing to food security, income and employment, UPA also reduces areas of over grown bush and justifies treating solid waste. UPA is practiced by households belonging to all wealth groups in their backyards or on available lands outside their homesteads. An estimated 83% of households have backyard gardens, in most cases of less than one acre. Ten percent of urban farmers cultivate between 1 and 3 acres, 5%, mainly in peri-urban areas, farm on 5 or more acres. Institutions and schools make up the remaining 2% engaged in UPA.

AGRICULTURAL PRODUCTION

David, S. 2003. *Growing beans in the city: A case study of Kampala, Uganda*. CIAT Africa Occasional Publications Series No. 39. Kampala: CIAT. (13)

Key words: crop production, technology, policy, women, food security

This paper reports on a study conducted in 2000 to provide descriptive information on bean production activities in Kampala that can serve as a baseline for future interventions and to guide agricultural researchers in making appropriate technical interventions on this important crop. The study situates bean production within the wider farming system context by investigating the range of agricultural activities in which bean farmers are involved, input use, general farming constraints and soil fertility management practices. The focus on beans allowed for collection of detailed crop specific information. A formal survey was conducted with 160 randomly selected bean farmers in Makindye, Rubaga, Kawempe and Naguru Divisions.

Urban bean farmers identified diseases and pests, land shortage, poor soil fertility, lack of varieties resistant to major diseases and pests, poor climate, poor seed quality and theft as their main production constraints. Despite the illegality of UPA in Kampala, there is considerable support for farming activities by a range of institutions including NGOs, research institutes, the government extension system and farmers' association. Urban bean farmers are relatively well informed and exposed to new agricultural technologies and information, especially in the area of agronomy. However, despite the active involvement of UPA service providers in Kampala, farmers' main sources of agricultural information are the radio, other farmers and local authorities.

David, S., G. Luyima, and M. Adrogu. 2000. Promotion of new bean varieties and technologies among farmers in Kampala, Uganda. Paper presented at the stakeholder and planning workshop for the CGIAR Strategic Initiative on Urban and Peri-Urban Agriculture at ILRI, Nairobi, Kenya, November 1-4. (13)

Key words: crop production, marketing, technology

This study addresses two issues pertaining to production of the common *bean* (*Phaseolus Vulgaris* L.) by urban farmers: seed marketing and modalities for introducing climbing beans as a new technology. It explores approaches for marketing seeds of new bean varieties with the objective of establishing a sustainable seed supply system aimed at urban farmers. Activities related to seed dissemination and with the introduction of the climbing bean, were conducted in two communities in Nakawa and Makindye Divisions.

Findings show that farmers in Kampala are anxious to obtain seeds of modern bean varieties and are willing to pay relatively high prices for seed of unknown varieties. Study results suggest that in identifying seed marketing outlets for urban areas, it is

important to consider the high level of mistrust in urban areas (especially towards merchants), storage space available to potential seed sellers and their accessibility. The paper also recommends using multiple marketing outlets so as to increase access to seed by all categories of farmers.

International Development Consultants and Incafex Consultants Ltd. 1999. *Uganda Fisheries Master Plan Study*. Report. Kampala: Ministry of Agriculture, Animal Industry and Fisheries. (10)

Key words: aquaculture, food security, women

One of the objectives of the government policy analyzed in the document was the development of aquaculture as an income generating activity and food security measure. In 1999 there were 4000 fish farmers in Uganda, the majority being women. Average pond size was .02 hectares, with some farmers owning several ponds. Aquaculture in Uganda is therefore recognized as a subsistence activity, with a handful of emergent commercial farmers operating ponds larger than 0.2 hectares.

Maxwell, D. and S. Zziwa. 1990. *Urban agriculture: A case study of Kampala*. Report, Makerere Institute of Social Research. (13, 8)

Key words: crop production, households, land tenure, food security

This study, conducted in Kisenyi, Kansanga, Kamwokya, Lubyapa, Naguru II and Kalerwe, makes an inventory of agricultural production in Kampala. Methodologies used include in-depth interviews, key informant interviews and a household survey.

Sixty-nine percent of households produced for household consumption, 23% produced primarily for household consumption, but also sold a significant amount of produce for supplement cash income and only 7% were engaged in commercial production. Findings show that the location of agricultural related plots in relation to the home was highly variable; about half (45%) were within the compound or immediately adjacent to the house. Only 10% were within half a kilometer of the house. Land ownership fell into two categories: *mailo* (freehold), which makes up well over half the land in the city, and public land which is held by Kampala City Council. Fewer than 10% of respondents indicated that they owned the land on which they were farming. Forty percent of respondents had no security of tenure at all and 20% were using public land with permission, which could be revoked anytime.

The study concludes that at the macro level, urban agriculture is a productive economic activity which makes use of otherwise under-utilized urban resources (particularly land and labor) and makes a significant contribution to the city in terms of food supply,

employment and income. At micro level, the practice is largely a component of the survival strategy of middle and lower income households.

Rubahayo, E. B. 1999. Factors affecting production and utilisation of indigenous vegetables in Central Uganda. *African Crop Science Conference Proceedings* 4:655-659. (13)

Key words: ecosystem health, vegetable, cash crop, postharvest

Due to the scarcity of indigenous vegetables, particularly during the dry season, this study was undertaken to identify production and utilization constraints. It was carried out in Mpigi District in 1997 using a structured questionnaire. Indigenous vegetables are an important component of the diet among the rural and urban poor. They are mainly harvested as volunteer plants during the rainy seasons, but in urban and peri-urban areas some farmers plant indigenous vegetables in small plots as a cash crop.

The study used a multi-disciplinary approach and investigated crop investment, agronomy, soil fertility, disease and pest management, post harvest and socioeconomic aspects. The paper suggests that lack of information about the importance of indigenous vegetables in the diet, lack of improved cultivation and post-harvest methods, low soil moisture during the dry season and unreliable markets were among the majority factors influencing production of these vegetables. The results also suggest that only a few species of indigenous vegetables were currently available, indicating that some species have become extinct. The author calls for urgent action to arrest the erosion of vegetable germplasm.

LIVESTOCK PRODUCTION

Kabugo, F. 1996. Economic evaluation of Friesian dairy cattle enterprises in Uganda: A case study of Nangabo Sub-County , Mpigi District. Unpublished MSc thesis, Department of Agriculture, Makerere University. (8, 3)

Key word: dairy, micro-enterprises, socio-economic analysis

The study evaluated the potential for future development of Friesian dairy cattle enterprises in Uganda and identified the critical constraints that impede the potential in Nangabo Sub-County, Mpigi District. Farmers were categorized according to the number of Friesian cows with at least one calf. Categories were: very small (1-4), small (5-15), and medium (16-50). No farms were found in the large commercial (over 50) group. Production costs, gross margins and profitability analysis were calculated to determine the profitability levels.

Small farms mainly used zero grazing and artificial insemination (AI), while bigger farms open grazed their cows on pastures in paddocks and keep bulls. Mineral supplements were not commonly used, although a variety of supplementary feeds were given. Both family and permanent hired laborers were employed while casual labor was rare.

Findings also indicated that stall-fed cows gave more milk (4,758 liters) per lactation than open grazed cows on small (3,811 liters) and medium (4,072 liters) farms. Labor costs contributed most (50%) to total production costs followed by feed costs (25%). The unit cost of production (Ush 193), gross margin per cow lactation (Ush 1,252) and returns to labor (Ush 2,657) were highest for very small farm followed by small farms. The report also revealed that increasing the herd size increases milk yields on all farms. However, in addition, land size, capital, and labor affected milk yield only on very small, small and medium farms respectively. The four major constraints on all dairy farms in the study area were: inadequate feeds, poor pastures due to lack of, or insufficient supply of, improved pastures seeds, poor veterinary services and inadequate credit facilities (in that order). Lack of markets for milk was also an important constraint on medium-sized farms.

The study therefore recognized the need for a sufficient supply of fodder (pasture feeds), improvement of veterinary services and provision of credit facilities to improve farmers' capital base, as well as improving the genetics and management of the local breeds in order to improve the performance of the dairy sector.

Musisa, T.K., P.K. Ngategize and E.N Sabiiti. 1999. Determinants and impact of integration of forage legumes in crop/livestock systems in peri-urban areas of Central Uganda. *African Crop Science Journal*, 7, no. 4:591-598. (13)

Key words: farming systems, legumes, dairy, crop production

The paper observes that the majority of the intensive smallholder crop/livestock systems in peri-urban areas of Central Uganda are characterized by low productivity due to factors such as poor management and inadequate feeds in terms of quantity and quality. The study investigates the determinants and impact of integrating forage legumes on the productivity of the systems based on interviews with 90 smallholder milk producers.

Findings show that integration is more likely to be practiced by farmers who have less farmland and/or are close to milk and inputs markets. Farmers who integrated legumes into elephant grass (*pennisetum purpureum*) obtained more herbage that remains greener into the dry season compared to non-integrators due to the ability of legumes to fix nitrogen in the soils. The study also indicates that farmers spend less money on artificial insemination services and their animals have a lower incidence of disease.

Ministry of Agriculture Animal Industry and Fisheries. 1993. Uganda national census of agriculture and livestock (1990-1991): Supplementary volume; large-scale institutions. Ministry of Agriculture Animal Industry and Fisheries, Kampala, Uganda. (10)

Key words: animal production, agriculture research, farming systems, poultry

This census of livestock and agriculture data collected from large-scale institutional farms covers: size and status, crop areas and production, livestock production and sales, agricultural inputs, machinery, farm buildings and employees.

Information pertaining to poultry and cattle are relevant to Kampala and its surrounding areas. In 1990-91, Mpigi District had the highest poultry sales (134,404 or 45%) followed by Kampala (130,972 or 44%) and Mukono (32,540 or 11%). In 1990/91 in Kampala District, production stood at the following levels: 87,815 liters of milk, 8,558 trays of eggs and 130,972 poultry. The figures from the Jinja District were: 60,502 liters of milk, 8515 eggs trays, 27 kg of honey, and 745 poultry.

Ossiya, S., N. Isyagi, L. Aliguma and C. Aisu. 2002. Urban and peri-urban livestock keeping among the poor in Kampala City. *Urban livestock keeping in sub-Saharan Africa, in Report of a workshop held on 3-5 March 2003 in Nairobi, Kenya.* Edited by J. I. Richards and S. H. Godfrey. Aylesford, Kent, UK: Natural Resources International Ltd. 21-38 p. (also 14)

Key words: animal production, livelihoods, income

Livestock production in urban and peri-urban areas has not received the due attention it deserves. Livestock keeping in Kampala City has grown over the years with the onset of substantial economic hardships in the early 1970s. Growth has since reflected the economic cycles Uganda has gone through as more people participate in a bid to offset

the gap between wages and felt needs. The growth of urban livestock keeping has also been an entrepreneurial response to increased demand for livestock products.

Most livestock keepers in Kampala are from the Baganda tribe, which dominate Central Uganda. Both rich and poor households participate in livestock keeping. Poor households keep livestock because of the higher incomes they get from selling livestock products compared with the income per unit area from crop production. Livestock provide mobilizable savings for critical periods/needs, and productivity can be targeted to meet peak festive season market demands. Poor households face unique challenges due to the lack of resources and therefore limited access to services and supplies.

The report identified two main challenges: 1. How can poor livestock keepers be provided with the appropriate knowledge and skills in order to optimize the social and material benefits that can be derived from livestock keeping? 2. How can the poor livestock keepers be empowered to influence policy to enable them to access productive resources and services?

Tumutegyereze, K. 1997. Comparative analysis of zero grazing and the fenced dairy production systems in peri-urban areas of Kampala. Unpublished MSc thesis, Department of Agriculture, Makerere University, Uganda. (8)

Key words: dairy, socioeconomic analysis, farming styles, farming systems

The study compares the profitability of dairy farming production systems in peri-urban areas near Kampala. It also investigates the socioeconomic variables that influence dairy production and whether dairy farmers are efficient in the use of resources, particularly labor. A cross-sectional survey of 60 dairy farms, 30 of which were zero grazing fenced farms, was conducted.

Findings indicate that zero grazing farms were more profitable compared to fenced dairy farms. In terms of cost contribution, fixed costs accounted for 79% for fenced dairy farms and 73% for zero grazing farms. Concentrates, hired labor, water, pest control and medication were the biggest variable costs for both types of farms. Annual gross margins on a per cow basis were Ush 163,0663 for zero grazing farms and Ush 628,024 for fenced dairy farms, indicating the greater profitability of zero grazing in peri-urban areas.

The study suggests that more areas of public sector intervention should be given due emphasis because they create a larger multiplier effect in the farm and non-farm economy. These include: insurance, extension and education, and the supply of veterinary services. The poor performance of the dairy sector has been largely due to poor funding as none of the farms studied had an alternative source of funding.

Uganda Food and Nutrition Council. 2000. *National food and nutrition policy, background information.* Ministry of Agriculture, Animal Industry and Fisheries, Uganda. (10, 15).

Key words: animal production, poultry, marketing

The report observes that livestock is an integral part of agricultural systems found in most parts of Uganda, contributing approximately 9% of national GDP and 17% of agricultural gross domestic product (AGDP). Livestock products contributed 20% of the AGDP in 1980, but decreased to 16% in 1990. Since 1986, the strong recovery of the dairy industry has led the sub-sector GDP to grow at 4.9% per annum. Also since 1980, the commercial and non-commercial production of poultry has steadily increased to 22.3 million birds in 1998. The management of exotic poultry is well known and practiced in contrast with indigenous chickens, which have been neglected. Urban areas continue to be the major producers and consumers of broilers and eggs.

FOOD SECURITY

Eresu, D. B. 2000. Report of the baseline survey on production, food security, nutrition, gender relations and socio-economic aspects of Nabweru, Wakiso, and Muduuma Sub-Counties of Mpigi District. Report for Environmental Alert, Kampala, Uganda. (13)

Key words: food security, human nutrition, socioeconomic analysis, policy

The document reports on a baseline survey conducted by Environmental Alert. Both qualitative and quantitative data collection techniques were used. The sample size was 295 of which 45% were males and 54% females. The household survey measured the nutritional status of 3 children per household. It documents the socioeconomic characteristics of the study population, agricultural production, household food security and nutritional status. It also examines the extent to which policy makers and other stakeholders' influence or support agriculture programs in the area. The report makes recommendations for interventions by Environmental Alert.

Average household size was 7 and the average size of land cultivated was 4.2 acres with 2.5 acres being allocated to food crops, 0.5 acres to coffee, 0.5 acres to pastures and 0.6 acres under fallow. Food insecurity is rampant in the community with 79% of the households not growing enough food to meet household needs. Poor childcare and feeding practices, unequal food sharing and insufficient nutritional knowledge are among the factors contributing to high malnutrition rates. Twenty-one percent of surveyed households eat three meals a day, 40% have two meals a day and 39% have one meal a day. The typical diet of the population is a starchy staple and beans.

Maxwell, D. 1995. Labour, land, food and farming: A household analysis of urban agriculture in Kampala, Uganda. Unpublished Ph.D. thesis, University of Wisconsin, Madison, Wisconsin. (13)

Key words: urban agriculture, food security, policy, land use

The study examines factors that explain contemporary urban farming in Kampala and measures the impact of urban farming, particularly in terms of household food security and nutritional status. Key informant interviews, household case studies, focus group discussions and a household survey were the main methodologies used.

The study shows that urban farming is largely a long-term adaptive strategy of women to protect household food security, either through the direct provision of supplemental sources of food, as a food reserve, or as a means of stretching other sources of income, especially among low income groups. Urban farming is significantly associated with better long-term food security and nutritional status of children, particularly among low-income households that make up 80% of the city's population. Gaining and maintaining access to land is identified as the biggest constraint to farming in the city. The author

suggests that proposed institutional reforms that would introduce major alternations in urban land administration and ownership would pose a threat to urban agriculture. The author discusses policy recommendations for supporting urban agriculture.

Maxwell, G. D. 1995. Alternative food security strategy: A household analysis of urban agriculture in Kampala. *World Development*, 23, No. 10:1669–1681. (13)

Key words: households, gender, urban agriculture, poultry, food security

Farming within African cities has become an increasingly important source of food for urban population, yet little is understood about the forces behind urban farming or its impact at the household level. Intra household dynamics and gender relations, as well as declining wages and economic informalization, are all important to an understanding of urban farming. Farming in Kampala was associated with higher levels of household food security and child nutrition. This paper outlines the linkages between economic strategies, access to land and food security and discusses the policy implications of urban farming in Kampala.

Maxwell identified four categories of urban farmers. One group produces almost entirely for the urban market, and so is characterized as commercial farmers. Poultry production is the most common form of commercial urban agriculture and an estimated 70% of all poultry products consumed in Kampala are produced in the city. A second group is comprised mostly of households in the peri-urban areas who retain enough of their customary land holdings and produce food for household consumption. The largest group farms to ensure some measure of food security. Farming for this group is likely to be both a secondary form of employment and a secondary source of food. The last group consists largely of households of very low income women, often recently widowed or abandoned by their husbands, who have very limited economic options. Members of this group farm because they often have no other means by which to acquire food. Whereas the third group (measure of food security) usually consumes all the food they produce, this last group is often forced to sell food, even if food for the household is insufficient.

Maxwell, G. D. 1996. Measuring food insecurity: the frequency and severity of “coping strategies”. *Food Policy*, 21, no. 3:291-303 (13)

Key words: food security, methodology, marketing, household

The paper observes that defining and interpreting food security and measuring it in reliable, valid and cost-effective ways have proven to be stubborn problems facing researchers and programs intended to monitor food security risks. This paper therefore briefly reviews the conceptual methodological literature on food security measurements, describes a particular method for distinguishing and measuring short-term food insecurity at household level (based on a Kampala study) and discusses ways of generalizing the method. It indicates that the method goes beyond more commonly used measures of

caloric consumption to incorporate vulnerability elements of food insecurity as well as the deliberate actions of household decision making when faced with food insufficiency.

Muwanga Musisi, J. 2001. Informal food markets, household food provisioning and consumption patterns among the urban poor: A case study of Nakawa Division, Kampala City. Unpublished BSc thesis, Department of Agriculture, Makerere University, Uganda. (13)

Key words: marketing, households, gender, policy

The study investigates the operations of informal food markets in household food provisioning in Nakawa Division. In depth interviews and observations were used to collect the data.

Findings reveal that there were more females than males in both households and markets and the main socioeconomic characteristics affecting provisioning were age, sex, marital status, household size, educational level, employment and ethnicity. On average, households had three or more meals per day. The most common staple foods were: maize meal, *matoke* (cooking bananas) and sweet potatoes. The study also looks at the politics and political economy of informal food markets.

Turyashemererwa, B. 1999. Household food security in peri-urban areas: A study of Matugga Parish, Mpigi District. Unpublished BA thesis, Department of Social Sciences, Makerere University, Uganda. (8)

Key words: food security, households, food production

The major aim of the study was to establish the factors leading to persistent food shortage in peri-urban communities. The study focuses on household food security among 70 respondents in Matugga Parish, a peri-urban area. Simple random sampling technique was used to select the respondents. The study was based on primary data collected from key informants and focus group discussions.

Findings indicate that household food security is influenced by a number of variables such as: socioeconomic factors, coping mechanisms and constraints to production. Socioeconomic factors such as sex, age, and marital status facilitate or hinder food production. The study indicates that shortage of labor; land, financial resources and inputs are the major factors that constrain food production. Thus, searching for more land, the sale of manual labor and animal rearing are among the many strategies used by peri-urban households to ensure food security. The author recommends that government authorities need to improve household access to land, labor and inputs in order to alleviate food shortages.

NUTRITION

Gimbo, A. 1993. Prenatal nutrition in Eastern Uganda: Diet, behaviour and constraints to adequate nutrition during pregnancy in Nakalooke Sub-County, Mbale District. Child Health and Development Centre, Kampala, Uganda. (Unpublished). (3)

Key words: human nutrition, food security, women

This study is an assessment of community knowledge, practices and attitudes towards prenatal nutrition in Nakalooke Sub-County, a multi-ethnic, peri-urban area 6 kilometers from Mbale Town. This qualitative study was conducted in two purposively selected parishes and data collected from focus group discussions and key informant interviews targeting pregnant women, elderly mothers (45 and above) and married men.

The main protein sources were beans, groundnuts (peanuts), sesame and peas, crops that are also grown for sale. Some families depend entirely on the market for food, since they do not own gardens; yet such families are low-income earners and cannot afford or purchase significant amounts of food even during pregnancy.

Kakitahi, T. J., and I. Zimbe. 2000. Urban nutrition and food security assessment in Makindye Division, Kampala District. Report prepared for Environmental Alert, Kampala. (9)

Key words: food security, human nutrition, urban agriculture, households

The purpose of the study was to assess the food security and nutritional status of households in Makindye Division and investigate factors influencing food security and nutrition. The study also sought to get information that Environment Alert could use to plan its activities and provide a benchmark for monitoring and evaluation. Six parishes and all 37 zones in Makindye were included in the study. Anthropometric measurements of children below 5 years were taken. Other methods used include key informant interviews and focus group discussions for men and women and youth groups.

About 45% of the households interviewed owned 0.25 acres or less; 24% owned between 0.25 and 0.50 acres and 14% had more than 2 acres. Despite land shortage, 442 out of 454 households said they were involved in crop production. Using crop production data, 30% of households were involved in agriculture in a substantial way. The most common food crops grown were: sweet potatoes (26%), beans (20%), cooking bananas (*matoke*) (16%), cassava (16%), maize (14%), fruits (12%), cocoyam (taro) (12%), vegetables (11%), sugar cane (6%) and groundnuts (1%). Food was grown mainly for family consumption. Nineteen percent of surveyed households reared animals such as dairy cows, poultry, goats and pigs. Some of the problems faced in crop production include: inadequate labor (34%), poor soils (12%), drought (11%), pests and vermin (11%),

cassava mosaic virus (9%), lack of improved seeds (1%) and inadequate extension services (1%).

The same foods were used for supplementary feeding of infants and feeding older children. *Matoke*, sweet potatoes, millet, fish and groundnuts were among the major foods given to children, but food choices varied by ethnicity and prevailing prices in the market.

Ndyanabangi, S. 1998. Nutritional status and its determinants in children under five years in Mpigi District. Unpublished MSc thesis, Department of Medicine, Makerere University, Uganda. (9)

Key words: human nutrition, households, animal production

This study makes an assessment of the nutritional status of children below 5 in Mpigi District and provides data for a District Plan of Action for Nutrition. A cross-sectional stratified, multistage cluster approach was used to select 420 children, 42% of which were from urban and peri-urban areas. Questionnaires, key informant interviews and focus group discussions were used to collect the data.

Households in urban and peri-urban were more likely to have less land than households in rural areas. The main food crops grown included roots and tubers, maize and *matoke*. The study also reveals that only 24% of the households were growing all food types including fruits and vegetables. About half of the sample owned domestic animals but mostly in small numbers (an average of 3 animals including poultry). Domestic animals contribute to the diet in form of milk (42%), eggs (32%), money to buy other foods (20%) and meat (6%). Food shortages were reported by 68% of 392 households. Three percent of households, all in urban and peri-urban areas, experienced food shortage throughout the year.

Taylor, A. 1998. Malnutrition in Uganda: A review of the causes and discussion of the programming implications. Save the Children Fund UK. (Unpublished). (3)

Key words: land tenure, households, indicators, women

This study was undertaken to help decision-making in the Nutritional Early Childhood Development Project and inform the development of programs to meet strategic objectives.

Findings on land access indicate that generally, landholdings are small in Uganda. Small-land holders farm an average of 2.2 hectares although at national level, 62% of households have less than 1 hectare. The report notes that 16% of households are landless, a figure influenced by the number of landless households in Kampala. The size

of land holdings restricts farmers' capacity to produce enough food to meet household needs and practice crop rotation and fallowing, thus reducing yields.

A case study of women in Kawempe Division highlights a range of important issues concerning the vulnerability of poor households in the urban context. Women who do not have access to land have fewer income generating opportunities, particularly in cases where husbands do not want their wives to work.

Maxwell, D., C. Levin and J. Csete. 1999. Does urban agriculture help to prevent malnutrition? Evidence from Kampala. *Food Policy*, 23, no. 5:411-424 (13)

Key words: urban agriculture, food security, human nutrition, households

The paper investigates whether urban agriculture has a positive impact on food security and nutrition status of households in Kampala. A two round survey was carried out using multistage random sampling. Information was collected during the rainy season (April) and during the immediate postharvest season (July-August) in 1993. Other data collection methods used were in-depth interviews and case studies.

When controlling for individual children, maternal and household characteristics, the study shows evidence that urban agriculture has a positive, significant association with higher nutritional status among children, particularly as measured by height for age. Several pathways by which this relationship is manifested are suggested and the implications for these results on urban food, nutritional policy and urban management are discussed.

GENDER

Nakijoba, V. 1996. Effects of wetland reclamation on women's socio-economic survival: A case study of Kampala District. Unpublished MA thesis, Department of Environment, Makerere University, Uganda. (8, 4)

Key words: wetlands, women, food security, human nutrition, environmental health

The study examines the effects of wetland reclamation on women's socioeconomic survival in Kampala. It focuses on trends in wetland resource utilization and effects of wetland reclamation on women's activities based on wetland resources. The study also proposes strategies that can be adopted by women to reduce their dependence on wetlands and enhance sustainable utilization of resources.

This study was based on primary information collected from six wetlands in Kampala namely; Nakivubo, Lubigi, Mayanja, Kiliddubi, Kyentinda and Kansanga. A two stage purposive sampling procedure was used and a total of 90 respondents was selected composed of 60 women and 30 men. Data were collected through a formal survey, focus group discussions and key informant interviews.

In the past, communities around wetland areas obtained many social and economic benefits from them. Both men and women harvested different resources from wetlands reflecting differences in gender roles. The study shows that women depend more on wetlands for their socioeconomic survival due to the domestic nature of their activities and indicates that access to wetlands for growing food crops improves household food security, nutrition and health. In addition, women acquire income from selling crops, namely cocoyam and sugar canes, grown in the wetlands. This supplementary income reduces women's dependence on their husbands which in turn increases their decision making power within the household. The study also looks at the destructive aspects of women's activities in the wetlands and recommends teaching women more environmentally friendly farming methods.

Musimenta, P. 1997. Urban agriculture and women's socio-economic empowerment: A case study of Kiswa and Luwafu areas in Kampala City. Unpublished MA thesis, Department of Education, Makerere University, Uganda. (8)

Key words: urban agriculture, women, gender

The study investigates the forms of urban agriculture women engage in, problems they face and the importance of agriculture to women's socioeconomic empowerment. It was conducted in two purposively selected divisions of Kampala: Nakawa and Makindye. The methods used included a formal survey of men and women farmers and key informant interviews.

Findings show that urban agriculture reduces gender inequality since the practice empowers women to contribute to their families' livelihood in terms of food and income when they sell off surpluses. Women who participate in urban agriculture make most of the decisions concerning which crops to grow and their use. The study identified two important dimensions of farming, which were classified according to location of the land under cultivation and product produced: on-plot (where farming is done on the same plot of land that the household occupies) and off-plot (where farming is done on a different plot of land, not occupied by that household). Urban farmers in Kampala are not specialized in either crop production or animal husbandry but grow a range of crops and keep a variety of animals. Looking at the constraints urban farmers face, the study found that some farmers are not aware that they lack legal authority to practice urban agriculture. Most of them believe that the government has the capacity to solve most of their problems by making urban agriculture a planned, legal activity.

The study recognizes the role urban agriculture plays on ecological, social and economic grounds. It therefore recommends that government should see urban agriculture as a new vision of the city, which has multiple purposes. Urban agriculture should be accepted as a very important informal urban activity that calls for immediate recognition.

POLICY

Davidson, S. 1994. Kampala Urban Study, Phase III Report Section: Environmental action programme. Blackstone Corporation, Kampala. (11)

Key words: sustainable agriculture, environmental exposure, land use, urban agriculture

Phase III of the Kampala Urban Study Project sought to design action programs in each sectoral area and delineate specific projects for implementation. The overall goal of the program is to promote the concept of sustainable development as an integral component of the overall planning process. This report summarizes the major issues related to ecological factors as well as 'structural' land use, social and other considerations.

The report shows that urban agriculture is a common activity carried out by over a third of Kampala residents and accounts for between 25-50% of urban land area. It recommends that agriculture should be permitted in suitable locations but notes that further investigation is needed to assess the appropriateness of specific crops and to establish guidelines to ensure the environmental sustainability of urban and peri-urban activities. The report proposes the need to establish urban agricultural standards and studies to allow appropriate management of such activities.

Ministry of Land, Water and Natural Resources. 1995. *National policy for the conservation and management of wetland resources*. Kampala, Uganda: Ministry of Natural Resources. (11, 16)

Key words: wetlands, policy, sustainability, indicators

The policy seeks to curtail loss of wetland resources and ensure that benefits from wetlands are sustainable and equitably distributed to all Ugandans. The report contains guidelines for wetland resource development, intended for people using wetlands for increasing food, fish and livestock production and for providing other goods and services.

Ministry of Agriculture Animal Industry and Fisheries. 1996. *The national cattle breeding policy*. Kampala, Uganda: Ministry of Agriculture Animal Industry and Fisheries. (10)

Key words: policy, aquaculture, animal production, technology

This document provides guidelines to farmers, companies, researchers, extension workers and civic leaders in the following areas: suitable breeds for the various agro-ecological zones including intensive dairy production in peri-urban areas, alternative breeding programs, import and export of and trade in genetic materials, breeding and management

systems for conservation, sustainable use of indigenous genetic resources and the use of modern breeding technologies.

Nostrand van, J. 1994. Kampala Urban Study: Final Report Part II: Structure Plan. Nostrand Associates Ltd. (Unpublished). (11)

Key words: land use, urban planning, urban agriculture, forest management, environmental health

The report presents a summary of the analysis leading up to the proposed Kampala Structural Plan. Basing on the recognition that land-use is mixed throughout the district and that it is difficult to separate industrial, commercial and residential uses, the report recommends that land use and zoning regulations should encourage mixed-use and reinforce life–work relationships.

Referring to the future structure of Kampala, the proposed Kampala Structure Plan (1994) proposes the protection and enhancement of urban agricultural and forestry activities within and adjacent to the city. The proposed Kampala District Plan also calls for environmental protection measures that accommodate permanent agricultural activities. The new consolidated communities in the proposed plan have an extensive system of continuous green space, which is intended to provide environmental protection for important ecological areas – particularly the existing shoreline and wetlands.

LAND USE /TENURE

Abongo, O. 2000. Environmental education curriculum for training of trainers of Living Earth for Kampala District. Living Earth, Kampala. (7)

Key words: land use, land tenure, urban agriculture, environmental health, urbanization

The curriculum provides background information on land resources in Kampala which include fresh water, fisheries, wetlands, rangelands, catchment areas, wildlife, crop land and mineral resources. It estimates area under various land tenure systems: private *mailo* land (49%), statutory leases held by Kampala City Council (30%), land under direct control of Uganda Land Commission (10%), freehold (7%) and leases held by institutions (4%). Wetlands cover approximately 16% of the district and are under extreme pressure of development to the point of total destruction in some cases. This curriculum addresses aspects of urban agriculture namely, environmental management, urbanization and the environment, principles of natural resource management, principles of land resources of Kampala and environmental health.

Bikaako, W. 1994. *Land to tillers or tillers to land: The existing forms of land tenure systems in Mpigi District.* Centre for Basic Research (CBR) Working Paper No. 44. Kampala: CBR Publications. (2)

Key words: social networks, land tenure, land use, property rights

This paper defines the nature of rights bestowed in land by different land interests. It investigates the land accumulation processes in two villages in Mpigi District (one peri-urban village) and the impact that these processes have on social differentiation. It focuses on initiatives taken by oppressed groups to solve their own predicaments and examines the consequences. The study also looks at the nature of land distribution and the implications of land concentration and fragmentation on patterns of land use and investment.

Kaggwa, J. 1994. *Land tenure and land use in Kampala District.* Community Basic Research (CBR) Working Paper No. 45. Kampala: CBR Publications. (2)

Key words: land tenure, urban planning, property rights, land use

The paper considers land tenure rules, customs and laws and the institutions that administer rights and land access in Kampala. Data are drawn from a formal survey and key informant interviews conducted in three villages in Makindye Division. Five continuums were drawn from the city center to the outskirts intended to know the categories of land tenure and use in the urban areas.

Major findings indicate that the most common mode of land acquisition was through purchase (70%), mainly by the well to do. Forty-three percent of surveyed households had between 0.21–0.50 hectares of land and 19% had plots of less than 0.20 hectares. The study indicates that majority of public land within the city was leased to the Kampala City Council as the controlling authority for 199 years (one hundred and ninety-nine years). The 1975 Land Reform Decree attempted to facilitate, promote and maintain better development and use of land as a natural resource by reducing dual ownership of land (land lords and tenants) and the development of land by absentee landlords. However, in practice, especially where individual freeholds existed, the decree has not been successfully implemented. Land continues to be owned under the *mailo* system and absentee landlords are the norm. The author concludes that even on public land under the jurisdiction of the Kampala City Council, individual rights to land have continued to play a dominant role in Uganda's land tenure system.

The paper also discusses the Urban Authority Act 1964, which gives Kampala City Council the mandate to manage Kampala City. It analyzes the Land Management Policy which covers statutory leases, land for the Government projects, the Kampala Development Plan, land planning and development and management, allocation of plots, the Departed Asians Property Custodian Board, law reform amendments and the Land Allocation Application Form.

Muhereza, F. 1992. *Land tenure and peasant adoptions: Some reflections on agricultural production in Luwero District*. Centre for Basic Research (CBR) Working Paper No. 27. Kampala: CBR Publications. (2)

Key words: land tenure, crop production, livelihoods

The paper analyzes agricultural producers' responses to specific land tenure configurations in two villages, one peri-urban and the other rural. Data collection relied on a formal survey, focus group discussions and key informant interviews.

The study shows that, rather than being tenants of the state through the intermediary of a landlord, tenants preferred indigenous land tenure systems: the *busulu* (fixed annual rent paid by the tenant to the land owner) and *enjovu* (cash levy or tribute charged on the growing of certain commercial crops such as coffee and cotton) systems. The paper notes that the prevailing tenure system has been highly influenced by farmers' struggle to gain access to means of production, especially land. It identifies conditions of access with a certain degree of rights specific to each land holding system as: *ttaka*, *kibanja* (plot of land), renting and borrowing. It further argues that the nature of land holdings and land distribution have made the conditions of access to land more and more restrictive in a situation of relative scarcity. The conditions of access, under tenancy, are inimical to the capacity of peasant households to produce their own labor, while the demand for land is satisfied by gaining access to hitherto agriculturally marginal areas.

Mulyowa, P. 1996. Farming activities within Entebbe Municipality and their impact on urban planning and urban land use patterns, 1962–1994. Unpublished MA thesis, Department of Land Use and Regional Development Planning, Makerere University, Uganda. (8)

Key words: urban agriculture, urban planning, land use

The study analyzes the impact of urban farming on urban planning and land use patterns in Entebbe Municipality. Three hundred and fourteen farmers were systematically selected and grouped into strata by type of farming activity, namely crop production, crop and livestock production and commercial livestock keeping. Data was collected through observation, a formal survey and key informant interviews. Land size and other measurement were also collected.

In 1962, urban farming in Entebbe was mostly carried out in the surrounding villages of the Municipality but it spread throughout the town during the economic decline of the 1970s. The study shows that urban farming activities have encroached on and overlapped with urban land use patterns set out on the 1959 Entebbe Outline Scheme. This has led planners to realize the importance of the activity and to include urban agriculture in the 1993 Structure Plan as one of the land use patterns in Entebbe Municipality.

Nafuna, P. 1998. The influence of land tenure on the utilisation and management of peri-urban wetlands: A case study of wetlands in Kampala District. Unpublished MA thesis, Makerere University, Uganda. (8)

Key words: land tenure, land use, wetlands

The study investigates how land tenure systems influence access rights, utilization and management practices of the wetlands in Kampala District. The study was carried out in Nakawa and Makindye Divisions among a random sample of 200 farmers. Data were collected through informal interviews, a formal survey, observation and photography.

The study shows that land tenure systems significantly influence access to wetlands for crop cultivation, settlement, brick making and sand mining. On the other hand, land tenure systems did not strongly influence access rights to wetlands for grazing, fishing and collection of other resources namely, fuel wood, medicines, craft materials and building materials, fodder and vegetables. However, access rights are influenced by land tenure systems. Under the customary tenure systems, wetlands are common property resources owned and controlled by an identifiable group such as a clan, lineage or tribe. Access is free and open to all individual members in the group, but non-members are usually excluded. Where wetlands are held under private tenure systems such as *mailo*, freehold and lease hold, individual owners have exclusive rights over the resources and access is restricted through inheritance, renting, borrowing or purchase. Legally, wetlands in Uganda are public resources controlled by the government.

The study concludes that existing land tenure system and modes of access in wetlands are inappropriate for the sustainable management of wetlands leading to fragmentation, excessive drainage and in-filling of wetland areas for crop cultivation and residential development. It recommends streamlining ownership and usufruct rights in wetlands so as to achieve sustainable management.

ENVIRONMENT

Development Consultants International Ltd. 1997. *District state of environmental report: Kampala District*. Kampala: National Environmental Management Authority Report. (11, 17)

Key words: urban agriculture, animal production, poultry

The report notes that most farming activities in Kampala District are for direct household consumption, although a few households in the peri-urban areas produce for the market. Crops grown in and around Kampala included cassava, sweet potatoes, pulse crops (beans), maize, *matoke*, cocoyams, vegetables, sugarcane, groundnuts and coffee. The size of cultivated areas varied from as small as five square meters to as large as 10 hectares. According to the report, Kampala farmers have relatively easier access to extension services compared to their rural counterparts. These include: lectures, demonstration, and farm visits, followups and program evaluations. With regard to livestock, the report points out that the number of indigenous cattle in Kampala District has decreased due to a crackdown by city authorities on free-range cattle keeping. The number of exotic and cross breeds under zero-grazing systems has, however, increased. Poultry keeping in Kampala is either an income generating activity or a hobby for middle and high income households to provide meat and eggs for household consumption.

Emerton, L., L. Iyango, P. Luwum and A. Malinga. 1999. *The present economic value of Nakivubo urban wetland*. Kampala: National Wetlands Conservation and Management Programme and IUCN. (13)

Key words: wetlands, food production, environmental health

The resources and services of Nakivubo wetland have high economic value, approximately Ush 2 billion a year. At the time of the study, there were 450-500 farmers in the wetland mainly growing cocoyams and sugar cane. Crop production in the Nakivubo wetland was estimated at Ush 200 million a year. The report suggests that the impacts of wetland degradation for different groups must be taken into account when developments are planned and implemented in and around Nakivubo. The case study emphasizes the importance of integrating wetland values into land use and development decisions, and provides estimates of the economic value of important wetland goods and services. The information it contains lends support to recommendations that Nakivubo should be fully recognized and designated as an economically important and environmentally sensitive area.

Jinja Municipal Council. 2000. Environment and developmental issues and problems: A baseline situation assessment report. Jinja Municipal Council, Uganda. (Unpublished). (11)

Key words: natural resource management, urban agriculture, land use, marketing

The baseline study aimed at identifying the environmental development problems of Jinja District and recommending strategies for environmental management and development. The study was carried out in all the divisions of the Municipality. Twenty-nine villages and 17 schools in 11 parishes were purposively selected. Data was collected using participatory rural appraisal, in-depth interviews, a formal survey and through observation.

The study showed that in Jinja Town agriculture is practiced on a small scale, especially on undeveloped land and in open spaces such as compounds and road reserves that account for 51% of the Municipality. Farmers engage in urban agriculture for both subsistence and commercial purposes and urban agriculture is estimated to contribute over 50% of what is sold in the markets of Jinja Town.

Kalyebi, P. 1995. Urbanisation and the environment, critical conditions for the formulation of an environmental management strategy for Kampala District, Uganda. Unpublished MSc thesis, Rotterdam University, Netherlands. (11)

Key words: environmental health, natural resource management, solid waste

This study investigates the underlying causes of environmental degradation in African cities. The Kampala case study conducted a rapid assessment approach to screen issues that are of primary importance. This involved discussions with key local government agencies and their principal partners in the public, private and popular sectors who share information and responsibilities in the city management functions.

The study attributes much of the problem of environmental degradation, in African cities, to the lack of public awareness, inappropriate policy frameworks and inadequate political commitments. For countries, such as Uganda, these shortcomings are worsened by two crucial factors. On the one hand, infrastructure is insufficient, and on the other, both the central government and local governments do not possess the requisite capacity to plan and manage towns and cities efficiently. Another persistence problem in Kampala is the inadequate collection and disposal of household garbage. The quantity of solid waste generated in Kampala was estimated at 25,000 tons per month, 760 tons per day. Kampala collection services extended to less than 10% of the population. The rest of the population, most of which consists of low income earners, make their own arrangements to dispose of solid waste. Some people bury it, some burn it, while others use unauthorized sites such as roadsides, public land or the drainage system.

The author suggests that in order to develop and implement environment management strategies and action plans, Kampala needs to upgrade managerial, regulatory, technical and financial capabilities, improve infrastructural arrangements, involving both the public and private sectors, and establish effective public participation. He recommends that

Kampala adopt a cross-media and cross-sectional approach to environmental management, upgrade its human resource and institutions, evaluate urban environmental issues, establish priorities for actors, resolve conflict and design and implement appropriate policies and investments.

Living Earth. 2000. Report of the baseline survey of selected marginalized communities in Kampala City. Kampala Integrated Environmental Education Project (KIEEP). Living Earth, Kampala. (Unpublished). (13)

Key words: natural resources management, poverty, socio-economic analysis

The study obtained information from communities and schools in Kampala District on key natural resource and environmental management issues. This information is meant to help the project implementers (Living Earth) understand Kampala District's specific environmental problems better, particularly as seen by the communities. All 5 divisions of Kampala were involved. A sample of 20 Local Council I chairpersons from each division was selected for the survey.

Findings and recommendations address issues on socioeconomic aspects and other cross-cutting issues such as poverty, land, its use and management, city council capacity, inadequate infrastructure, environmental concerns, community characteristics and education.

Ngaka, W. 1997. Effects of urbanisation on wetlands management in Uganda: A case study of Nakawa Division, Kampala District. Unpublished MA thesis, Department of Public Administration, Makerere University, Uganda. (8)

Key words: urbanization, wetlands, natural resource management, land use

This study discusses the effects of rapid urbanization on the management of wetlands and their associated resources with specific reference to Nakawa Division. The study covered all wetland sites in Nakawa Division and adjacent communities. Respondents were purposively selected and data collected using semi-structured and structured interviews and observations.

Findings reveal that urbanization has significantly contributed to the overexploitation of the wetlands and their associated resources, destabilization of the ecosystem, distortion of hydrological systems and increase in flood frequency. Furthermore, there is lack of coordination of environmental management issues and a lot of laxity in enforcement of environmental laws.

The study concludes that urbanization has greatly contributed to the destruction of the wetlands and that the present land use patterns have failed to maintain the ecological character and biological diversity of Nakawa Division. It recommends that urban

development should proceed in an environmentally sustainable manner and in full recognition of the local urban ecosystem.

Nabihamba, E., and S. Buyinza. 2001. A situation analysis of land use/cover stratification. Environmental Management and Capacity Building Project II: Jinja District Workplan 2001/2. (11)

Key words: land use, urban agriculture, crop production, animal production

A situation analysis exercise was carried out to assess land use patterns in Jinja District. This report indicates that both subsistence and large-scale agricultural activities are being carried out in the district. The main economic activity of people living in peri-urban areas of Jinja District is agriculture. About 85% of farmers are engaged in crop production, 12% are engaged in mixed farming and a much smaller portion is engaged in livestock keeping and fishing.

National Environmental Management Authority. 2001. Status environmental report for Uganda 2000/2001. Ministry of Land, Water and Natural Resources, Kampala, Uganda. (11)

Key words: wetlands, crop production, environmental health

In its analysis on wetland degradation, the report notes that Nakivubo Swamp is under intense pressure for cultivation purposes, house construction, and brick making. Sugar cane, cocoyam, sweet potatoes, and bananas are the main crops grown and the report estimates that in Upper Murchison Bay, bananas have already claimed more than 60% of the original swamp area.

Nuwagaba, A. 2002. *Changing character of livelihood systems among the urban poor communities and valued environmental components: implications of urban farming on environmental health in Uganda.* Report to IDRC. Kampala, Uganda. (13)

Key words: households, livelihoods, environmental health, policy

The study assesses livelihood systems among urban poor households in Kampala and Jinja and their implications for Valued Environmental Components (VECs). Valued environmental components refer to water quality, lagoon reclamation, solid waste management and drainage systems management. Methods used included Participatory Rural Appraisals (PRAs), focus group discussions and a formal survey of 384 households. Surveyed households were classified into two categories: those who farmed where they lived and those who farmed in areas away from their home. The purpose of this stratification was to determine the impact of farming activities on the ecosystem and how environmental health in the ecosystem influenced household health.

The author argues that the growth of urban poverty has culminated in the emergence of livelihood systems such as urban farming which have deleterious effects on urban environmental health as manifested in the quality of household water sources, status of drainage systems and waste disposal methods. For example, poor methods of waste disposal have resulted in the prevalence of disease vectors such as vermin and malaria carrying mosquitoes. The study found that households living in or near farming areas experience more malaria and dysentery than those living away from farming areas mainly due to lack of proper sanitation facilities. The author proposes that the Ministry of Agriculture and NARO should include urban and peri-urban agriculture in their programs. He also calls for local urban authorities to develop and enact substantive legislation for urban farming activities.

Ssendawula, J. 1997. The potential for use of composted urban market garbage in soil fertility management. Unpublished MSc thesis, Department of Agriculture, Makerere University, Uganda. (8)

Key words: waste, composting, marketing

This study investigates the availability, seasonal variation and composition of Kampala City market garbage. It also determined the amount of nutrients in urban market garbage (UMG) compost and assessed the effects of UMG compost application under field conditions on soil chemical properties and crop yields. Five markets in or near Kampala were studied: Katwe, Kasubi, Nakulabye, Kawempe and Bwaise.

Banana leaves and peelings and sweet potato peelings accounted for the bulk of the garbage in all markets. Several other garbage components, which occurred in significant quantities, were bulked to form sample lots referred to as “other garbage components” (OGC). The levels of dumpings per day were high. On average, monthly dumping consists of 1.04 t of banana leaves, 0.56 t of banana peelings, 0.42 t sweet potato peelings and 1.28 t of OGC, all on dry weight basis.

Tumusiime, M. and J. B. Mijumbi. 1999. *Socio-economic survey of Nakivubo Wetland*. Report prepared for National Wetlands Conservation and Management programme. Kampala: Ministry of Lands, Water and Environment. (13)

Key words: wetlands, waste, urban agriculture, ecosystem health

The survey aims at making an assessment of the socioeconomic importance and desirability of small-scale resource use of Nakivubo Wetland in light of its functions as a tertiary sewage treatment system for Kampala City. In addition to secondary data, other data collection methods included participatory rural appraisals, historical profiles, user matrices, discussions and interviews using questionnaires.

Findings indicate that small-scale agriculture is a major activity, accounting for 95% of the activities taking place in the wetland. The main crop grown is cocoyam. The majority of wetland dwellers live within less than 3 kilometers and have used wetland resources for at least five years. The study concludes that crop growing in the wetlands neither affects the quality of water in Murchison Bay nor wetland capacity to control flooding. The major problem is pollution of the affluent that goes into the wetlands.

FORESTRY/AGROFORESTRY

Edema, L. 1997. Adoption of agro-forestry technologies in Mpigi District. Unpublished MSc thesis, Department of Forestry, Makerere University, Uganda. (8)

Key words: agroforestry, technologies, social aspects

This study identified constraints to the adoption of agroforestry technologies in Mpigi District. One of the study sites was Mpigi Town. Data collection methods included participatory rural appraisal, key information interviews and a formal survey of 265 households. The major constraints to the adoption of agroforestry technologies were education, age and gender.

Kayita, R. L. 1998. Factors influencing the adoption of new technologies of integrating and utilising fruit trees in the farming systems of Mukono District. Unpublished MSc thesis, Department of Forestry, Makerere University, Uganda. (8)

Key words: legumes, technology, farming systems, agroforestry

The study investigates why new technologies of fruit tree integration and utilization are not well adopted. It also investigates the influence of farmer characteristics on the adoption pattern of the new technologies. The study draws on a sample of 150 randomly selected fruit tree growers from Kawolo, Nazigo and Ntenjeru Sub-counties that include both urban and peri-urban areas.

Major findings indicate that the cropping system consists of cash and food crops, livestock, poultry, agroforestry, apiary and aquaculture. The most common fruit trees were avocado, jackfruit, papaya, mango and citrus. Intercropping was the most common arrangement for incorporating fruit trees in the cropping system. Apart from manure application and pruning, which had adoption levels of above 20%, adoption of other new technologies was generally low. Farmer characteristics that minimally influenced the adoption pattern of new technologies included: intra-household decision making patterns, land ownership, division of labor and distance to selling place.

The study concludes that integration of fruit trees within the farming system is not a new venture in Mukono District. However, popularization of fruit trees became important with the diversification strategy that aimed at increasing food and the export base in Uganda.

Mwebesa, M. 1998. Marketing of forest products from the Pilot Private Wood Farmers' Component of the Peri-Urban Plantations Project. Unpublished MSc thesis, Department of Forestry, Makerere University, Uganda. (8)

Key words: agroforestry, crop production, marketing

This study investigates factors affecting demand and supply of forest products, marketing options for forest products and the profitability of Eucalyptus grown in the Peri-Urban Plantation Project areas. Project areas include areas around Kampala, Jinja, and Mbarara, with Masaka District as the control. Data collection methods include key informant interviews, a formal survey and observation.

The study shows that there is a potential demand for forest products, but factors such as socioeconomic characteristics of producers and infrastructure, play a big role in marketing. Farmers achieve higher profits through diversifying forest products and producing firewood, building poles, fence posts and timber instead of selling trees as stumpage. Farmers in the study area did not have marketing strategies due to poor valuation of their resource and consequently did not realize realistic profits for their products. Eucalyptus growing is profitable and farmers are able to realize profits after the second rotation, after all costs have been offset.

CODES FOR LOCATION OF ENTRIES

1. Association of Ugandan Women Professionals in Agriculture and Environment
P.O. Box 11432, Kampala
Email: aupwae@africaonline.co.ug
2. Centre for Basic Research
Plot 15 Bakerville Avenue Kololo,
PO Box 9864, Kampala
Email: cbr@cbr-ug.org
3. Child Health and Development Center, Makerere University (library)
Makerere University Institute of Public Health.
New Mulago Hospital Complex
P. O. Box 7072 Kampala
4. Department of Women's Studies, Makerere University (library)
Plot 45, Pool Road, opposite Makerere University Swimming Pool
P.O.BOX 7062 Kampala
5. Environmental Alert
P O Box 11259, Kampala
6. Kampala City Council
P.O. Box 7010, Kampala
7. Living Earth, Kamwokya
PO Box 28694, Kampala
8. Makerere University (main library)
P.O. Box 7062, Kampala
9. Makerere University, Institute of Public Health
New Mulago Hospital Complex
P. O. Box 7072 Kampala
10. Ministry of Agriculture, Animal Industry and Fisheries
Box 102, Entebbe
11. National Environmental Management Authority (NEMA)
P.O. Box 700, Kampala
Email: info@nemaug.org

12. Send-A-Cow, Uganda, Namirembe Church Diocese
Namirembe Diocesan House
P.O. Box 14297, Kampala
13. Urban Harvest (formerly SIUPA) collection on UPA at CIP/ PRAPACE
(Regional Potato and Sweet Potato Improvement Program for East and Central Africa)
Plot 7, Bandali Rise, Bugolobi
P.O. Box 22274, Kampala
14. http://www.ruaf.org/ruafpublications/urban_livestock_workshop.pdf
(assessed August 12, 2005)
15. <http://pma.go.ug/pdfs/food%20and%20nutrition%20policy.pdf> (assessed August 12, 2005)
16. http://ramsar.org/wurc/wurc_policy_uganda.htm (assessed August 15, 2005)
17. <http://www.nemaug.org/DSOER/KAMPALA.pdf> (assessed August 12, 2005)

LOCAL AND NATIONAL INSTITUTIONS INVOLVED IN URBAN AGRICULTURE

ACFODE (Action for Development)

Plot 623/624 ACFODE House Bukoto Kampala
Box 16729 Kampala
Contact: Mrs. Annette Muwonge
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Email: acfode@starcom.co.ug
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BUGADEV (Buganda Cultural Development Foundation)

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Community Farmers' Network(COMFARNET)

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Environmental Alert

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Nkoola Institute of Development Association (NIDA) Ltd.

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Plan International

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**Send-a Cow Project, Namirembe Diocese, Church of Uganda
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**Uganda National Farmers Federation (UNFFE) –formerly UNFA Uganda National
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