ANALYSIS OF GENDER ROLES IN RESOURCE RECOVERY FOR URBAN AND PERI-URBAN AGRICULTURE IN NAIROBI

Njenga M. [1], Gathuru K.[2] and Karanja N[3].

[1] *Urban Harvest-CIP, ILRI campus P.O. Box 25171-00603 Nairobi, Kenya*
[2] *Kenya Green Towns Partnership Association, P.O. Box P.O. Box 54909-00200, Nairobi, Kenya.*
[3] *Soil Science Dept, University of Nairobi, Box 30197-00200 Nairobi, Kenya*

Abstract

Community based composting groups were analysed in Nairobi using a set of semi-structured questionnaires and check-lists. Gender composition and differentiation of roles within these groups were documented. Details of two CBO's were prepared to illustrate their gender based issues that may assist in mainstreaming in research and capacity development. Gender and age were found to influence the way men, women and youth related in their group based activities. Preference of crops grown and farming patterns practised in a wastewater irrigated farm, were found to be influenced by gender. There is need for research and technological development to address gender based issues in resource recovery from urban waste for enhancement of urban-peri urban (UPA).

Author Keywords: *Gender, Composition, Community Based Organizations (CBO's) Internal Conflicts*
Abbreviations: *Ksh-Kenya shillings, MOSW-municipal organic solid waste, MSW-municipal solid waste, NCC-Nairobi City Council, UPA-Urban and Peri-urban Agriculture, CBO's-Community Based Organizations, ILRI-International Livestock Research Institute, WAC-World Agroforestry Centre,*

1. Introduction

The current population of Nairobi is estimated at 3M its annual urbanization rate is estimated at 4.5 % (Ministry of Planning and National Development, 2003). It is also estimated that over 1740 tonnes of solid waste is generated daily of which 60-70% is organic (JICA, 1997). Sixty percent of Nairobi's population live in very low-income informal settlements, with poverty level ranging between 60 to 78 percent. This group of urban poor is projected to increase to 65% by 2015 if the trend continues. Unemployment rates are estimated to be 18.5% and 14.5% males and 25% females respectively (Ministry of Planning and National Development, 2003). In the mid-1980s, 20% of Nairobi households were growing crops within the city limits and 17% of the households kept livestock in the urban areas (Lee-Smith et al., 1987). In 1998, there were about 24,000 dairy cattle in Nairobi, worth roughly US$ 13 M and currently about 42 million litres of milk worth about US$ 11m (priced at US$0.3/litre) is produced annually in Nairobi. Estimates indicate that 50,000 bags of maize and 15,000 bags of beans are produced in Nairobi annually (Ministry of Agriculture, 2002).

Management of Municipal Solid Waste (MSW) presents a major challenge for many Sub-Sahara African cities, where rapid growth, social and cultural change, widespread poverty, inadequate and weak local governance and limited financial resources all contribute to increasing pollution and waste disposal problems (Onibokun, 1999 in Karanja et al unpublished). For instance only 40% of the MSW produced in Nairobi is collected and

disposed by the City Council (ITDG-EA, 2003). The rest is uncollected, leading to the proliferation of garbage heaps which is a common feature in residential areas, along the roads and even within the central business district (ITDG-EA, 2003). Due to failure of NCC in coping with the large amounts of waste generated in the city and its environs, communities are increasingly being involved in the management of MSW for the purposes of generating income, self employment and environmental management. As a source of income, food and self employment, many farmers from informal settlements, have developed local knowledge on use of wastewater for crop and fodder production. Within a 20km radius of Nairobi centre, over 3,700 farmers practised irrigation agriculture and 36% of them used raw sewage water (Hide and Kimani, 2000).

Bearing this in mind then, the word "waste" which refers to something that is "no longer serving a purpose" or, something "without value" according to Concise Oxford Dictionary. But this situation has changed dramatically in the developing countries and depending on a number of factors, informal urban dwellers under given circumstances consider waste materials as a major resource for their sustained survival and livelihood. For example, oily milk packages are used as fuel; leftover food particularly from kiosks and restaurants are collected and used as feed for pigs and goats;discarded cardboard and packaging materials serve as building materials and most of organic waste from markets are collected and used as feed for ruminants as well as raw materials in compost production. Under such scenarios one would expect that, gender would play a major influence in the way the waste resource(s) are valued and used for different purposes such as domestic utility, saving on household expenditures and earning money. This has therefore brought about a gendered definition of 'waste' and of 'resources' which has to be reflected in any discussions on waste management in all community based consultation processes (Muller Maria et al ,mmuller@waste,nl).

Women and men, male youth, female youth, are engaged in different waste- related activities, partly because of cultural traditions and conventions, partly because of practical interests, such as earning income, maintaining a healthy living environment and for self esteem. The productive and reproductive roles of people within a community have played a significant role in the selection and preference of farming and cropping systems. In many instances women have been responsible of ensuring that families get their daily food requirement while men take care of such expenses as school fees, house rent and medical care.

This paper points out the immediate and strategic gender needs as key determinants in resource recovery in UPA in Nairobi.

2. Methodology and Approaches

Study Area

Nairobi is located in southern Kenya, 500 kilometres from the coast at an elevation of 1670m above sea level and covers an area of 700 square kilometres (Hide et al., 2001) Mean annual temperature is 17^0C, while the mean daily maximum and minimum are 23^0C and 12^0 C respectively (Situma , 1992). Mean annual rainfall ranges from about 800 to about 1,050 mm, depending on altitude (Ng'ang'a , 1992). Most of it falls in two distinct seasons: the long rains from mid-March to June and the short rains from mid-October to early December.

Project Implementation Approach

The study illustrate gender involvement in management of MOSW for urban and peri urban agriculture as well as a livelihood strategy. The data was compiled from a survey conducted in 2003-2004 on management of organic waste and livestock manure for enhancing agricultural productivity in the urban and peri urban Nairobi. The study was carried out by Urban Harvest in partnership with ILRI, World Agroforestry Centre (WAC), Kenya Agricultural Research Institute (KARI) and Kenya Green Towns Partnership Association (KGTPA).

The objectives of the study were to inventories community based organizations involved in organic waste management for UPA, document the existing composting groups in Nairobi, analyse composting management techniques, model rural-urban nutrient movements and link stakeholders in UPA. During the study, 10 composting groups were interviewed in Nairobi while an additional was identified from the neighbouring town Ruiru for its specialization mining compost from the dumpsite, while three CBO's involved in UPA activities were interviewed. The CBO's were identified using literature (Ishani et al., 2002), existing database (ITDG, 2003), with the help of KGTPA and chain interviews, while the location of the CBO's was led by KGTPA.

Primary data was collected through individual and group interviews using a set of semi-structured questionnaires and check-lists covering group dynamics, compost and manure production, use and marketing.

3.0 Results and Discussions

3.1 Group Dynamics in Compost Production

Fourteen CBO's involved in UPA were studied where their gender composition, activities and relationship among members were established as illustrated in table 1. The groups were found to share their roles and duties differently which had a link to gender and age of members.

Table 1. Groups Location Composition, Activities and Sources of Internal Conflict

	Group	Location	Year of formation	Gender composition M:F	Activities	Internal conflict and cause
1.	Tuff Gong Garbage Recycling Group	Informal settlement	2000	8:3[2]	Composting	
2.	Kuku Women Group	Informal settlement	1978	2:8[m]	Composting	
3.	Kayole Environmental Management Association	Low income estate	1998	5:5 [m]	Composting	-Financial -Roles sharing
4.	Mukuru Recycling Centre	Dumpsite	1992	0:12[3]	Composting	
5.	Mathare Borea Composting Group	Informal settlement	2998	4:4 [m]	Composting	
6.	Garbage Recycling Programme (Save The Children)	Market	1995	4:0[1]	Composting	
7.	City Garbage Recyclers S.H.G	Low income estate	1996	9:6 [m]	Composting	-Financial -Roles sharing
8.	Youth United Against Environmental Pollution	Dumpsite	2000	20:8[2]	Composting	-Financial
9.	Soweto Youth In Action	Informal settlement	2001	16:5[2]	Composting	
10.	City Park Environmental Group	Market	1993	4:8 [m]	Composting	-Financial -Roles sharing
11.	Kawangware Afya Bora S.H.G	Market	1993	5:15 [m]	Composting	
12.	Ngei 1 Youth Development Group	Informal settlement	1997	55:9[2]	Sale of Organic waste to livestock keepers	-Roles sharing
13.	Youth Foundation	Informal settlement	1997	12:0[1]	Mixed farming	
14.	Siranga Ya Ngombe S.H.G.	Informal settlement	2002	11:4 [m]	Livestock keeping	-Roles sharing

[1] Male Youth groups, [2]Youth groups of both gender [3] Women groups of mixed age
[m] Youth and elder people of both gender, X With internal conflicts

3.1.1 Gender Composition, Roles Differentiation and Financial Management

The CBO's were composed of male and female adults and male and female youth. In terms of male:female ratios, six groups had more males than females, three had more females than males, two had equal numbers of males and females, two had females alone and two had males alone. In terms of age, eight groups had a mixture of both youth and elderly people with their ages ranging from 25 to 71 with an exception of one group which had 32 children below 15 years of age. In these eight groups, seven were

composed of both male and females while one had females only. There were six youth groups, four of which had both male and female and two had males alone.

There were internal conflicts in six out of the 14 interviewed CBO's which were based on *gender* and *age differences*. Gender and age driven internal conflicts were rooted in allocation of duties and financial management. In nine of the CBO's, allocation of duties among members was haphazardly done and was based on the presence of members during their activity days. Out of the nine groups with no duty plans, five groups had internal conflicts, four of which were of mixed gender and age and one was made up of youths of both gender. In the absence of duty plans, no conflicts were noticed in three gender and age mixed groups where women did all the work while men shared the benefits and in one age mixed females alone group. Clear division for manual labour and leadership roles was done mainly by youth groups where five out of the six had well planned schedules and duty rosters. Three of these five youth groups with well planned roles, were made up of both gender while two were of males only. In these groups, few or no conflicts on duty allocation and financial management were noticed. An example, is the Tuff Gong Garbage Recycling youth group, which had a clear duty roster and females were allowed by their male counterparts to do activities that they considered 'less dirty' such as fetching water from a tap, while the male youths did the sorting, turning and sieving.

Gender and age based conflicts arising from financial management were noticed in four of the six CBO's, with internal conflicts. Of these four CBO's three were of mixed age and gender while one was a youth group with mixed gender and practised clear roles allocation. These four groups produced and sold compost, had bank accounts but no accountability and transparency was done. An example of gender and age based internal conflicts rooted in roles differentiation and financial management, is presented in the case study 1(Box1), of City Park Environmental group. Other examples are in City Garbage Recyclers S.H.G and Kayole Environmental Management Association, where young males did not trust elderly men with financial management.

In summary there were three types of groups without internal conflicts: (a) male youth groups (b) females of different ages (elderly and youth) (c) groups where women did all the work and men were only passive members who shared the benefits. In the forth category the absence of conflicts is based on the choice by women to remain silent and do all the work. *What could be the reason for this behaviour?* . Age difference as a cause of conflict was only noticed in groups with male members.

To enhance our understanding of the way communities utilized the resource 'waste' and the involved gender issues, in the informal settlement areas; two case studies are presented in the next two sections. Case study one present's a mixed gender and age CBO, that produce compost from market waste. Case study two present a very well organized group of farmers who depend holly on raw sewage which they have tapped from city council sewer line system. The group is here referred to as 'Langata-Kibera Irrigation Scheme (LKIS). The farmers are have been cultivating the land for the last 20 years. Details of the two case studies are presented here below in Box 1 and Box 2 respectively.

Box 1.

Case Study 1: Compost Production for Poverty Alleviation (City Park Environmental Group, Nairobi)

The case study was carried out in January 2004, with an objective of understanding gender involvement in composting market waste. This group, is located at the City Park Asian Market in Parklands, Nairobi. The composting group was started in 1993 with a membership of 7 men and 8 women with a purpose of income generation, support to destitute children and cleaning the market. This initiative was as a result of funds from the Asian Foundation who funded construction of the market facility for sale of vegetables. The challenges of uncollected market waste led to the formation of the composting group which was technically supported by UN-Habitat Nairobi office who trained the group. Asian Foundation constructed the shade where waste sorting and composting takes place and also in advertising for the compost to their neighbours and institutions they are linked with such as the hospitals and schools. The group is guided by a constitution that stipulates the rules and regulation upon the members for instance resource management (time, sale of compost and income, external support).

Since its inception, the women were allocated the role of sorting the waste and transferring it to the shade house, while men arranged it into composting heaps. The men also turned and watered the heaps on a weekly basis till maturity. Sieving and packing including storage was done by the whole group. One man whose stall was closest to the store was allocated the duty of selling and keeping the store keys. The cash obtained from the sales was handed to a lady cashier for banking. Income accrued from the sale of compost was shared among the member at the end of the year. A misunderstanding arose in 2002 when the 4 men and the chairlady, took some compost to the Kenya Agricultural Show, where they made some sales but failed to remit to the cashier for banking according to the laid down procedure despite the fact that they had been advanced allowances to cater for their sustenance. This brought about misunderstanding in the group since they had high expectations in market opportunities and cash which resulted into a retrogressive growth of the group. Although the four men, still claim to be members, they have neglected composting activities completely although they do appear whenever visitors with potential funding appear.

Currently, the group's active members are eight women, 40% of whom are over 65 years. This has affected the productivity of the composting activity, since they are unable to perform the heavy duties that are crucial to production of good quality compost for instance collecting different types of organic materials, watering and turning regularly and packaging. The women no longer follow composting skills that they learnt but have reverted back to their local know-how. They argue that the skill the approaches are labour intensive and time consuming. The store keys are kept by one of the elderly ladies who opens the store twice a week, sells the compost herself and the money is shared amongst four women as it comes, without banking it. The group lacks records on quantities of compost produced or the income generated in the last 3 years.

Box 2

Case Study 2. Wastewater use for Crop and Fodder Production (Lang'ata-Kibera, Irrigation Scheme, Nairobi)

The site was characterized in February 2004, as part of a description of the practical site for the UA regional Training held in Nairobi in March 2004. The farm cover an area of 20 acres and is located 10 km South West of Nairobi and bondered by Lang'ata Barracks and Uhuru Gardens on the southern side and Kibera slums on the northern side. Just ahead of the site about 1km on the South Western side, is the oldest park in Kenya, Nairobi National Park. The land belongs to National Social Security Fund who through informal arrangements have allowed the farmers to use it for crop production since 1997. The farmers on this site are from Kibera slum which is separated from the farm, by Nairobi dam. Kibera slum has a human population of 700,000 and produces 420t of municipal solid waste (MSW) per day. The slum has 10 locations/villages each composed of about 10,000 persons, and administered through a chief who is assisted by elders.

Lang'ata-Kibera, Irrigation Scheme, is a community-based organisation of urban farmers practising irrigated farming at Lang'ata. It has 70 members but currently only 35 are active comprising 25 men and 10 women. The crops grown include sugarcane, fodder (napier grass), maize and vegetables (including indigenous African leafy). Eighty percent of the produce is sold, while 20% is consumed at home. Marketing is done on-farm and majority of crop customers are from Kibera slums, while fodder is mainly bought by farmers from rural areas.

Furrow irrigation is done using wastewater which is sourced through tapping of the city council sewerline. Irrigation schedules are professionally drawn and each farmer is allocated three hours of irrigation water per week. This programme has reduced conflicts which would result from use of this type of resource. The farm layout is such that on the upstream where majority of men are is the entry of raw sewage which passes through sugarcane and fodder plots then into vegetable growing plots thus the men concentrate on fodder production while the women use the plots downstream grow vegetables. When the team visited this farm an observation was made on the effect of the cropping arrangement and natural water filtration as it passed through the sugarcane and napier grass such that by the time it got in the vegetable most of the raw solid materials in the sewage had been removed.

When asked to comment on labour requirement for each crop, men and women said that vegetable growing was labour intensive while sugarcane and napier required less labour as weeding was less. Sale of sugarcane,maize stover and napier grass was done per unit area in the farm while vegetables were sold in batches. There are several middlemen who were males who bought and cut fodder from the farm or harvested it at no cost from the nearby Nairobi dam and sold it to motorists at the road.

There has been discussion between Urban Harvest and the farmers on the possibilities of on-farm treatment of sewage water but a lot of resistance has been raised by some of the members who are unwilling to substitute plant nutrients coming from wastewater with animal manure or compost. They argue that workload would increase through transfer of manure from their homes in Kibera to fertilize the soil

4. Conclusions

- Gender and age differences influence internal conflicts within CBO's which are rooted in roles sharing and financial management. The conflicts are more common within groups composed of men and women of different age categories. Age driven differences occur among men only.
- Well planned allocation of roles was practiced by youth groups which helped in managing internal conflicts. Considerations of social-cultural backgrounds while sharing the duties, made the youth groups cohesive.
- There were no internal conflicts in composting CBO's comprised by mixed gender and age , where women did all the manual work without complaining, while men continued to be passive member but shared benefits.
- Financial management where transparency and accountability lacked, caused internal conflicts among composting groups even where duty allocation was accepted among the members.
- In wastewater farming, women prefer growing crops that would provide household food requirements as well as income although their production system was more labour intensive. Crops such as kales and spinach although highly labour intensive generate income frequently and in small amounts. The women do not mind getting the income in small amounts.
- In wastewater farming, men prefer growing crops that generate income in large amounts and are less labour intensive such as fodder and sugarcane. Men trade in fodder which they buy from farmers or acquire at no cost and sale along the road which they consider as less labour intensive and generate a lot of income.
- Age and gender affect the adoption of technological options in resource recovery for UPA. Elderly women and men shy off from picking up new technologies which they consider to be time consuming and labour intensive.

Recommendations for research and development

- There is need for capacity building for CBO's involved in resource recovery, with gender and age sensitive approaches e.g. on roles allocation through well layed out duty rosters.
- There is need for consideration of existing local knowledge in development of technological options in resource recovery for UPA.
- There is need to establish why women accept to carry out all the activities in compost production without complaining while men only participate through benefit sharing.
- There is need for research and awareness raising among men on need for their involvement in crop production for household food supply as more savings could be made from producing own food other than generating income to buy the same.
- There is need for gender based research and awareness raising on, on-farm wastewater treatment for UPA.

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