

A Comparison of Male-Female Household Headship and Agricultural Production in Marginal Areas of Rachuonyo and Homa Bay District, Kenya

Auma, J. O.¹, Lagat, J.K.² and Nagigi, M.W.²

ABSTRACT

Studies on agricultural production and gender are full of contradictions as to whether female farmers are less productive than male farmers even under similar production systems and environments. The objective of this paper was to assess and compare the agricultural production differences of the male and female headed households in marginal areas bordering Lake Victoria region. A sample of 125 farmers surveyed during feasibility study of smallholder irrigation scheme in Rachuonyo and Homa Bay district was used for the study. The study compared demographic, socio-economic and agricultural production characteristics of male- and female- headed households using t-ratios. The study revealed that female heads of households were significantly less educated, owned and cultivated smaller land parcels, used fewer family labour in the farm but more external labour as compared to male headed households which formed 54% of the sample. Female-headed households were less efficient in agricultural production as they produced about half the production of male-headed households and disposed 38% of the produce in the local market with negative implications on both household food security and commercialization of agriculture. The study concluded that female-headed households need to be specifically targeted with specific programmes that will reduce low production trap by increasing farm productivity through provision of cheap agricultural credits and/ or subsidies. The government should pursue policies that expand rural economies that will discourage temporary male out- migration to urban centres which is the main source of *de-facto* female headship.

Keywords: Male-headed households, Female-headed households, Marginal farms, Agricultural production.

INTRODUCTION

The general concern on gender-related issues and rural development in Sub-Saharan countries started in late 1990s after realizing the importance of women in economic development. Women account for 36% of the agricultural labour force in developing countries as a whole; however in Africa, they form the majority of farmers producing 90% of food, but they are less

important in export crops (Haleh and Denis, 1992). About 88% of the women in rural Kenya are economically active (Government of Kenya (GoK), 1999). Women traditionally contribute most of the labour required for the cultivation of food crops on family holdings and increasingly in the production of cash crops (Orvis, 1985, 1989; GoK, 1999).

Overall, women in Kenya provide 75% of the labour on small holdings and 96% of rural women work on the family farms (GoK, 1992). Almost 60% of smallholder family income comes from the farms and is produced largely by women. Past development projects, researches and policies

¹ Agricultural Extension Officer, Ministry of Agriculture, Kenya.

² Senior Lecturer, Department of Agr. Economics and Agribusiness, Egerton University, Kenya.

Received on 9/8/2009 and Accepted for Publication on 5/4/2010.

have been criticized of being 'gender blind' because the crucial role played by women at the farm in achieving food security at the national level as well as the household level is seldom taken into account (FAO, 1998).

While both male and female smallholders lack sufficient access to agricultural resources, women generally have much less access to resources than men. Worldwide, women have insufficient access to land, membership in rural organization, credit, agricultural inputs and technology, training and extension and marketing services (FAO, 1998). The female headed households (FHHs) access and cultivate less land, have poor access to credit services and capital and do not give consideration to output prices offered in the market, probably due to low traded volume of agricultural outputs (Auma, 2008). Kenya, like most other Sub-Saharan countries, continues to experience low agricultural production and food insecurity. According to FAO (1998), this is unlikely to change unless sufficient and relevant gender-disaggregated agricultural statistical data become available, which would contribute to a better comprehension of existing gender differences and related requirements for appropriate support to agricultural development. The lack of collection and dissemination of gender-disaggregated data is one of the underlying causes of the neglect of women contribution to agricultural production and food security in agricultural development policies and research (Saito et al., 1994).

When households headed by women are taken into account, total female participation in agriculture is greater in all developing regions especially in Kenya, where such households are poorer than male headed households (MHHs) (GoK, 2007). It is important to consider the role of headship because available data show that female headship is relatively high and increasing in many places. In sub-Saharan Africa, for example, it was estimated that women head one-

fourth of rural households; in some areas they head almost half (Due and Gladwin 1991). In Kenya, Saito et al. (1994) observed that 38% of the sampled households in rural areas are headed by women. Due to their vulnerability, female headed households (FHHs) need to be specifically targeted with agricultural development programs for food security to be properly addressed in Kenya.

It is also important to note that in most of the Sub-Saharan Africa, agriculture is the livelihood of 69% of the economically active population, and in rural communities producers and consumers live in the same households and are often the same people (FAO, 1997). The way rural households function and make decisions and their visions of the future have long been recognized as essential information for planners and policy makers in the agricultural sector. What is less frequently recognized is the significance of the consequences of different levels and patterns of production and consumption and the effects of agricultural decisions on the household food security and nutritional status of both producers and consumers in the rural and urban areas (FAO, 1997). Gender segregated studies have shown different factors to be affecting the gross value of output from male and female headed households. Tiruneh et al. (2001) observed farmer's age, family labour, farm size, livestock units and inorganic fertilizer as the factors that affect the gross value of output in male headed households, while family labour, farm size, livestock units, use of inorganic fertilizer, hired labour and extension contact were observed to be affecting the gross value of output of the female-headed households. This contradicted with the results of Mook (1976) and Saito *et al.* (1994) who found extension contact to be a significant factor affecting output in male-headed but not in female-headed households.

In Africa, preliminary studies from rural areas and national sample survey data suggest that the incidence of

female-headed households varies inversely with the economic potential of the area. Incidence tends to be high in areas where agricultural productivity is low, either due to population pressure or unfavorable ecological factors. For example, a study conducted by Chipande (1987) in Malawi revealed that an area of very high agricultural potential had only 16% of the households headed by women out of the total sample. These households were largely composed of older women (45 years old and above) who were mostly widowed, divorced, single or living alone or with unmarried children.

Marginal areas of Homa Bay and Rachuonyo districts are characterized by unfavorable climatic conditions and hence by low agricultural potential and high incidence of female-headed households. The prevailing view in literature is that this trend results from male labor migration, especially from areas of low agricultural potential. It is clear that in some rural economies the strain placed on conjugal relations by the exploitation of the rural areas as labour reserve is producing enormously high proportions of female-headed households (Murray, 1981; Bush et al., 1986). In addition to male labor migration, there is evidence that increasing socioeconomic differentiation in rural communities is producing female-headed households (Cliffe, 1978). Changes in kinship systems and in the organization of agricultural production have meant that many poorer women have lost the security provided by former kinship networks and relationships.

Many development projects currently give more attention to women in promotion of agricultural production and household food security by providing women with the productive resources. While such efforts are most welcome, the major question remains whether increasing access to resources, when men remain the decision makers on resource utilization in agricultural production, has

significant impacts on the efforts to attain improved agricultural productivity and household food security.

Studies that relate gender and agricultural productivity have conflicting results in terms of whether male farmers are more productive than female farmers (Udry, 1995; Quisumbing, 1995; Neupane and Thapa, 2001). Most of these studies focused on plot level rather than household level male-female productivity. Comparison of crop yields under female-headed households and male-headed households captures the managerial effects on efficiency and gender in agricultural production, which is quite elusive with the plot level management.

The main objective of this paper was to compare agricultural production differences between the male-headed and female-headed households in the marginal rural areas.

METHODOLOGY

The Study Area

Rachuonyo and Homa Bay districts are characterized by frequent crop failures due to unreliable rainfall, especially the marginal zones around the Lake Victoria region. This has been aggravated by low use of external farm inputs such as fertilizers and improved certified seeds (GoK, 2004). Subsistence farming (maize, sorghum, beans, local vegetables and local cattle) dominates the two districts without major cash crop since cotton industry collapsed in the early 1990s as a result of poor marketing and pricing policies (GoK, 2004). Irrigated horticulture, mainly tomatoes and kales is poorly developed despite great potential offered by many rivers crossing the districts and feeding Lake Victoria. The two districts suffer a food deficit when productions are compared to population, and the incidences of poverty are high (above 70%) (GoK, 2004). Out-migration of male partners in search of

employment to supplement farm production creates *de facto* female-headed households, where male partners are temporarily absent from home. When households headed by widows, divorcees and single women are considered along with *de facto* female headed-households, the proportion of FHHs in the two districts was 46% of the surveyed households (Kimira-Oluch Smallholder Irrigation Development Study (KOSHIDS) Survey, 2005). The study sampled households from three marginal divisions bordering Lake Victoria (Low midland zones three and four); that is Rangwe in Homa Bay and West and East Karachuonyo in Rachuonyo District.

Sources of Data

The study used data collected during the feasibility study of Kimira-Oluch Smallholder Irrigation Scheme (KOSHIDS), which was conducted by a consulting firm on behalf of Lake Basin Development Authority (LBDA) in the year 2005. Permission to use data for the study was granted by LBDA management in 2006. The survey was conducted in the months April-June and was meant to establish the baseline yield-levels of crop and livestock enterprises before an irrigation project implementation. Information on household head occupation, sources of income, household expenditures on various items and agricultural marketing and credit facilities was collected. The data was suitable for the study since it comprehensively captured both male and female headed household production levels plot-by-plot in the previous agricultural year, 2004.

Sampling Procedure

A list of updated households obtained from Kenya National Bureau of Statistics (GoK, 1999) comprised of 6732 in the 3 administrative divisions formed the sampling frame from which a sample of 125 households was randomly selected by the use of SPSS computer software. The three divisions were first divided into 11

locations and 17 sub-locations. Each sub-location was further sub-divided into enumeration areas (GoK, 1999). A proportionate sample of households from each enumeration area was randomly selected by the use of “random sampling of cases command” in SPSS. Replacement of missing respondents was done by the same procedure. Since the area of the study is of low agricultural potential where male out-migrate in search of waged employment, women headed households formed a significant proportion of the sample. This allowed for stratification of the data into male-female headed households without purposive sampling of female-headed households.

First, a baseline survey was conducted in the three divisions to harmonize KNBS list of households according to 1999 census. Information on sex, age and education level of household head, household size, ownership of livestock, crops grown and whether irrigated, was collected during the first stage in which the actual number of households was established. Secondly, detailed households and plot-level information was collected from 125 sampled households by the use of a structured pre-tested questionnaire. Agricultural production information from each plot operated by the household in the previous cropping year (both seasons included, where relevant) was collected. This included crop yields by plots, farm-gate prices of outputs produced and consumed at home and sold, value of farm equipments and labour available for farm work, full-time and part-time, during the year. Household characteristics such as sex, age and education level of household head, household size, agricultural assets endowment and non-agricultural income sources were collected. .

Data Analysis

Both descriptive and quantitative statistics for both pooled and gender disaggregated data were computed and independent sample t-test was applied to detect

differences in the means of variables between male and female headed households.

RESULTS AND DISCUSSIONS

Household Demographic Characteristics

The mean age of household heads was 47 years for the entire sample (Table 1). Mean age of female heads was higher than the sample mean and that of male heads. However, the mean difference of age of male-headed and female-headed households was found insignificant. There were generally large household sizes with a mean of 6 members per household for the overall sample. Household members by age distribution were almost in equal proportion implying that members below and above 18 years old were equally distributed across the female- and male-headed households. Male-headed households tended to be larger than female-headed

households by one person though mean difference was insignificant.

The female heads of households generally had low level of formal education compared to the male heads. The female heads had 4 years of formal education on the average compared to 8 years of formal education of the male heads. The significant difference in formal education implied poor state of women in terms of literacy levels where more than a third of them had no formal education (Auma, 2008). Education as a measure of human development index is a basic requirement in the improvement of welfare of households since it enables information access and when large proportion of female heads were illiterate as has been observed, then one anticipates high incidences of poverty among such households due to lack of empowerment (UNDP,2002).

Table 1. Selected household demographic characteristics.

	All Mean	FHHs Mean	MHHs Mean	t-values	p-values
Age of household head (hh) (years)	47.12 (15.33)	48.77 (15.74)	45.68 (14.95)	1.12	0.263
Education level of household head (no. of years in school)	6.176 (4.179)	4.189 (3.60)	7.895 (3.893)	-5.26	0.000
Number of hh members	6.06 (2.86)	5.77 (3.16)	6.31 (2.58)	-1.05	0.297
Number of hh members below 18 yrs	3.22 (1.78)	3.08 (1.91)	3.34 (1.67)	-0.80	0.423
Number of hh members above 18 yrs	2.84 (1.92)	2.68 (2.06)	2.97 (1.80)	-0.81	0.418

Note: Standard errors are in parentheses.

Land Characteristics

Households had several isolated plots of land which were not consolidated into one parcel. They operated several isolated pieces of land, ranging from 1 to 15 plots with the majority (69%) having between 2 and 4 plots. Plots were categorized according to use; (1) for crop cultivation, (2) grazing, (3) forest/woodlot, (4) long-term fallow (>1 year) and (5) short-time fallow (<1 year).

There were four main distinct land use patterns in the study area (Table 2); land under crop production, land under short-term fallow (<1 year), land under long-term fallow (more than 3 years) and land used specifically for grazing. Cases of land rented in, land owned and land rented out were

also observed. Land cultivated included all the plots operated by each household during 2004 agricultural year; i.e. land owned, land rented-in, grazing land and fallow land. Size of land operated by households ranged from 0.028 to 13 hectares (ha) with a mean of 1.87 hectares (SD= 1.952) for the entire household. The mean land size operated by FHHs (1.50 hectares; SD= 1.2876) was lower than the entire sample mean (1.87 hectares) and MHHs mean (2.2 hectares; SD= 2.32). The mean difference of MHHs and FHHs was statistically significant (t=-1.710; p<0.05). The mean land size under fallow (short or long term) and grazing was statistically insignificant across the two categories of households.

Table 2. Size of land cultivated, land used for grazing and fallow (ha).

	All sample	FHHs	MHHs		
	Mean (n=125)	Mean (n=58)	Mean (n=67)	t-values	p-values
Total land operated by households (hh)	1.87 (1.95)	1.50 (1.29)	2.19 (2.35)	-1.97	0.044
Land under short-term fallow	0.08 (0.196)	0.06 (0.148)	1.00 (0.233)	-1.04	0.285
Land under long-term fallow	0.1 (0.4)	0.12 (0.536)	0.08 (0.231)	0.59	0.559
Grazing land	0.468 (1.09)	0.33 (0.72)	0.588 (1.33)	-1.33	0.171
Area under crops	1.22 (1.0)	0.99 (0.68)	1.42 (1.18)	-2.44	0.013
Land owned by hh	1.78 (2.27)	1.38 (1.3)	2.13 (2.28)	-1.86	0.054

Note: Standard errors are in parentheses.

Source: KOSHIDS survey, 2005.

Land owned by households (mean = 1.78ha; SD= 2.27) compared well to total land used by the households (mean=1.87ha; SD= 1.95) since the difference was insignificant, implying that a small proportion of the farmers was renting in land from others for any form of agricultural production (Table 2). This scenario persisted even when the households were disaggregated into male- and female-headed households. FHHs owned smaller land (mean =1.38ha; SD=1.3) than MHHs (mean= 2.13ha; SD= 2.28) and the difference was statistically significant ($t=-1.874$; $p<0.1$). Similarly, FHHs cropped a smaller area (mean=1ha; SD=0.68) than MHHs (mean=1.42ha; SD=1.18) and the difference was strongly significant ($t=-2.441$; $p<0.01$). Cropped area (mean=1.22ha; SD=1.0) for the entire sample was lower than that of MHHs (mean= 1.42ha; SD1.18), but was higher than that of FHHs (1.0ha). In summary, the FHHs cultivated smaller land size compared to the average land cultivated in the marginal zones of the two districts and this might be one possible source of inefficiency in agricultural production in female-headed households, since there is an evidence to show that they were not land constrained. They cultivated about 0.4ha less than the total land available or owned.

Farm Equipment/Assets Owned

The importance of farm equipment is to enhance farm production, keeping in mind the absence of mechanized operations. Fittingly, farmers owned various farm and non-farm assets such as ox-ploughs, sprayers, wheel barrows and small farm tools for cultivation and harvesting such as hoes and machetes, animal sheds, farm buildings (stores) and bicycles, the basic mode of transport.

Ox-plough, the most important means of land preparation in the region was owned by 46% of the households. A few households (7%) owned sprayers and about 30% had wheel barrows normally used in short distance transportation. A smaller proportion of

farmers had constructed animal sheds (23%) and farm buildings (28%). Bicycle provides the essential service of transporting both human and farm produce to distant markets and about 40% of the households owned at least one bicycle. When households were disaggregated into female-headed and male-headed, it was observed that the proportion of FHHs owning most important farm assets (ox-plough and bicycle) was lower than the proportion of MHHs owning similar assets. Fewer FHH (41%) owned ox-ploughs compared to MHH (51%). The lesser numbers of women owning this implement may have implications on their overall food production as it is the main means of preparing land. Fewer owned bicycles (33%) compared to men (60%) ($t= -2.307$; $p< 0.05$), and almost equal proportions owned farm buildings, animal sheds and sprayers. More women (40%) owned wheel barrows compared to men (26%) ($t=1.738$; $p< 0.10$).

Labour Analysis

Labour for agricultural production was assessed in terms of number of family members available monthly for agricultural activities during the year and was categorized as follows; full time adults (number of adults available for farm work at least 80% of the time in the farm), part time adults (number of adults available for about 50% of the time for farm work), own children and external labour hired during peak demand (number of days and persons hired). By categorizing external labour into hired and friends/relatives, the study observed that 23 (SD=14.50) persons equivalent were available fulltime for agricultural activities, 6 (SD=9.75) persons available part-time and 9 (SD=11.9) children available during weekends and school holidays for the entire sample from January to December with a total of 38 persons equivalent (SD= 21.43). This compared

well with the means for both MHH and FHH (mean=34; SD=21.54).
households, MHHs (mean=42; SD=20.85) and FHHs

Table 3. Labour availability for agricultural production.

Labour Type /wage	All sample Mean (n=125)	FHHs Mean (n=58)	MHHs Mean (n=67)	t-values	p-values
Full-time adults (persons/yr) (no. of adults available for farm)	23.73 (14.50)	21.41 (15.03)	25.73 (13.82)	-1.672	0.097
Part-time adults (persons/yr)	5.76 (9.74)	5.12 (8.60)	6.32 (10.66)	-0.685	0.494
Child labour (children/yr)	9.20 (11.90)	8.10 (10.44)	10.16 (13.04)	-.965	0.337
Total family labour (persons/yr)	38.69 (21.43)	34.63 (21.54)	42.21 (20.85)	-1.995	0.048
No. of days labour was hired in the year (days/yr)	23.11 (55.87)	28.78 (76.28)	18.21 (28.05)	1.055	0.294
No. of days friends/relatives assisted in the farm (days/yr)	26.19 (56.87)	27.40 (74.77)	25.15 (35.28)	0.219	0.827
External labour total (days/yr)	49.30 (109.01)	56.17 (148.60)	43.35 (56.39)	0.654	0.514
Hire labour wage rate (US \$/day)	0.97 (2.13)	0.58 (0.49)	1.31 (2.48)	-1.930	0.052

Note: Standard errors are in parentheses.

The mean differences of fulltime and total family labour available for agricultural activities were statistically significant ($t=-1.672$; $p<0.10$ and $t=-1.995$; $p<0.05$ respectively), while those of own children and

part-time adult labour were insignificant. Generally, FHHs had lower family labour than MHHs, but the scenario was different with external labour, where the FHHs had higher external labour (mean=56 days;

SD=146.6) compared to MHHs (mean=43 days; SD=56.39) even though the difference was statistically insignificant. FHHs used more of hired labour (mean=29days; SD=76.28) compared to MHHs (mean=18 days; SD=28.05). This implied that FHHs benefited less from family labour compared to MHHs even though the wage rates offered by female farmers to hired casual labour were far much lower than that offered by male farmers as indicated. FHHs paid casuals US \$0.58 per day (SD=0.49) compared to US \$ 2.13 (SD=2.48) paid by MHHs and the difference was statistically significant ($t=-1.395$; $p<0.1$). This might have effects on the agricultural productivity of FHHs in two ways; first, hired casual labour efficiency generally tends to be lower than that of the family labour unless strict supervision is undertaken. Secondly, low wage rates de-motivate casual labour resulting in low-quality work. These results were also an indication of imperfect labour markets in the rural areas since wage rates did not reflect the demand for casual labour by the two categories of households. In addition to family and hired labour, farmers also seek assistance from relatives and friends during peak labour requirements. FHHs received more assistance from relatives and friends (mean=27 days; SD=74.77) compared to MHHs (mean=25 days; SD=35.28). Generally, children contributed 23% of family labour for agricultural production (mainly weeding and grazing of livestock) irrespective of the type of household.

Agricultural Production in Female- and Male-Headed Households

Plot-level production aggregated for each household and farm-gate prices were used in estimating the total value

of produce part of which was sold. Both long and short rain crop seasons were considered. Since farmers practiced intercropping, the yield of each specific crop was converted into monetary terms at plot-level before aggregated into household level. Commonly grown crops included maize and sorghum (major food crops), beans, cowpeas and root crops (arrows roots, sweet potatoes) and cotton. Farmers also produced milk from their local cattle part of which was locally sold (Table 4).

The value of annual crops produced was estimated at US\$ 386 of which about 80% was harvested in the long-rain season (main-season). Unfortunately, slightly more than half (55%) of the produce was sold soon after harvesting by the majority (68%) in that season. Few farmers (39%) sold short-rain (second-season) output even though more than half (56%) planted short-rain crops which performed poorly due to inadequate and unreliable rainfall. The major disadvantage was that farm produce sold immediately after harvesting fetched low prices. When needed later, it would be purchased at a higher price.

The most food insecure months were April and May and that is when most families purchased food items for consumption. During this period, there is high demand for cash for food, other household responsibilities and farming activities. Both male- and female-headed households hardly can meet the financial demand. Trade-offs occur either in terms of reduction in food intake or postponement of other activities. Most households harvested and sold food crops concurrently. The ratio of produce sold to aggregate annual production was high, not because of excess production but due to desperate need for cash resulting to farmers disposing what are essentially family basic food requirements.

Table 4. Summary of agricultural production and sales (US\$).

	All Mean (n=125)	FHHs Mean (n=58)	MHHs Mean (n=67)	t-values	p-values
Aggregate production of crops-main season (US\$)	306.5 (432.8)	179.0 (325.5)	416.9 (483.5)	-3.174	0.001
Value of produce sold-main season (US\$)	170.9 (332.7)	79.3 (242.6)	249.5 (378.7)	-2.939	0.003
Aggregate production of crops-second season (US\$)	79.4 (268.8)	57.9 (128.1)	98.3 (347.0)	-.832	0.382
Value of produce sold-second season (US\$)	42.1 (203.4)	22.5 (78.1)	59.1 (268.0)	-1.002	0.290
Aggregate annual crop production (US\$)	386.0 (551.3)	236.9 (336.9)	515.0 (646.8)	-2.894	0.003
Aggregate annual crop sold (US\$)	212.7 (422.3)	101.9 (259.4)	308.7 (506.8)	-2.805	0.004
Annual value of fruits produced (US\$)	19.3 (41.9)	12.7 (27.6)	25.1 (50.7)	-1.660	0.087
Value of fruits sold (US\$)	6.9 (20.6)	3.1 (8.6)	10.3 (26.6)	-1.956	0.041
Farm-gate price of milk (US\$/litre)	0.34 (0.04)	0.32 (0.05)	0.34 (0.04)	-.953	0.350
Amount of milk produced annually (litres)	239 (452)	212 (400)	263 (494)	-.630	0.524
Value of milk produced annually (US\$)	83.8 (165.8)	73.5 (146.7)	92.8 (181.3)	-.648	0.512

	All Mean (n=125)	FHHs Mean (n=58)	MHHs Mean (n=67)	t-values	p-values
Amount of milk sold (litres)	76 (212)	55 (227)	94 (199)	-1.016	0.317
Value of milk sold (US\$)	26.2 (75.1)	19.0 (82.8)	32.4 (67.8)	-.996	0.328
Aggregated value of agric. production-annually (US\$)	489.3 (598.1)	323.2 (392.1)	633.0 (703.0)	-2.978	0.003
Aggregated value of agric. produce sold-annually (US\$)	245.9 (438.6)	124.1 (269.9)	351.4 (523.2)	-2.980	0.002

Note: Standard errors are in parentheses.

The value of crop produced by FHHs (US\$ 237) was comparatively lower than that of MHHs (US\$ 515); ($t = -2.894$, $p < 0.01$). The mean of entire households was US\$ 386. The difference between the value of crops produced by MHHs and FHHs was statistically significant ($t = -3.174$; $p < 0.01$) for long-rains but not for short-rains. Similar trend was observed in the value of sales, where output sold by MHHs was significantly higher than that sold by FHHs ($t = -2.939$; $p < 0.01$) for long-rains, but not for short-rains. A range of factors were likely to explain differences in crop values in the two households: first, timeliness of farm operations is one such critical factor due to unreliable rains in the marginal areas bordering Lake Victoria, and late land preparation and planting would cause serious crop failure. This is where FHHs are most disadvantaged since the majority- as previously observed- lack animal draft power which was the sole means of land preparation and planting. Secondly, women cultivated smaller plots compared to available land resulting in low

quantity of produce in general. Thirdly, women were found to be engaged in many off-farm economic opportunities with little stream of incomes which may not adequately compensate or support farm activities, hence resulting in loss of yields. Lastly, women used more hired casual labour at low wage rates negatively affecting the quality of work with negative implications on farm outputs as observed earlier. These factors might influence the mean difference of the aggregated production and sales observed between the two groups of households ($t = -2.978$; $p < 0.01$, $t = -2.980$; $p < 0.01$, respectively).

Fruit production was not common, even though some farmers (60%) kept few trees of mangoes, citrus, pawpaw and guavas for domestic consumption (52% of households). The value of fruits produced and sold during the year was estimated using farm-gate prices. About 48% of the households sold some fruits while the majority consumed all the fruits at home. The aggregate mean value of fruit produced per year was US\$ 19. The

mean for FHHs was US\$ 13 and US\$25 for MHHs. The value of fruits sold was US\$ 7, 3 and 10 for the entire sample, FHHs and MHHs, respectively. The difference between the FHHs and MHHs was statistically significant ($t = -1.660$; $p < 0.1$, $t = -1.956$; $p < 0.05$) both for production and sales, respectively. However, when gender of household-head was considered, almost an equal proportion of FHHs (58%) to MHHs (61%) produced fruits even though fewer FHHs (44%) sold fruits compared to MHHs (51%), implying that female-heads value family welfare more than male-heads of households (Bett, 2006). The value of fruit produced contributed less than 4% of the total value of agricultural production and this was an indication of poorly developed fruit enterprises despite the area being suitable for fruit production due to its high temperatures and other agro-ecological factors.

Milk production was a challenge in the study area looking at the mean value of milk sold. Although only one third of milk was sold and two thirds consumed at home, the pooled mean value was still not substantial. Although the difference was not significant, the mean value of milk sold was lower (US\$ 19) for FHHs as compared to (US\$ 32) in MHHs. This result reflects the low potential nature of local cattle in milk production as there were no dairy cattle in the study area.

Ownership of local cattle was very important in the study area, both as a productive capital and a store of wealth hedging the farmer against risks and uncertainties. The value of livestock was estimated according the prevailing market prices or at the value which the farmer would dispose of his livestock. The mean values of livestock in FHHs were generally higher than the entire sample mean and male-headed households except for calves' value. The mean difference was insignificant for all the herd structure across the households except for the average value of

heifer which was weakly significant. This implied that women valued their cattle more than men and especially when it is a heifer. Possibly, they were also ignorant of the prevailing market prices at the time of survey.

Almost 60% of the households earned below US\$ 13 from poultry irrespective of whether FHHs or MHHs in the year preceding the survey. Larger proportion of MHHs earned between US\$ 26-40 compared to the FHHs and almost an equal proportion of households earned in excess of US\$40 in the same period. The general equal distribution of income from poultry is attributed to the fact that the enterprise was considered a women's enterprise, with absolute access and control whether the male head of a household is the final decision maker or not.

Apart from poultry, some household members were involved in fishing or fish processing and trade. Despite the fact that the study area neighbours Lake Victoria, a small proportion (24%) of the households was involved in fishing or fish trade. Only 16% and 31% of FHHs and MHHs, respectively, were involved in fishing, fish processing or fish trade. There was a large disparity of the incomes earned from fishing and associated business in favour of MHHs as men were engaged in fishing as owners of productive capital or as hired labour while women were engaged in small- scale fish business with very little capital requirements and returns. This explained the large disparities in fishing incomes between the households as MHHs earned up to US\$ 1315 which was more than double the maximum earned by FHHs.

Overall Farm Production and Sales

Aggregated value of agricultural production (Table 4) was obtained after summing up the values of annual crops, fruits and milk produced in the household. The mean value of agricultural produce for the entire household surveyed was US\$ 489. The mean value for

FHHs and MHHs was US\$ 323 and 633, respectively. Half of what was produced was sold by the entire households while 55% and 38% of the production was sold by MHHs and FHHs, respectively. The differences were statistically significant ($t=-2.978$; $p<0.01$, $t=-2.980$; $p<0.01$) for production and sales, respectively. Since women achieved low volume of agricultural production and at the same time had to meet the household food requirements, they were bound to have low marketable sales compared to MHHs. The latter might have produced more than the household minimum food requirements and therefore the excess was sold in the local market. This has negative implications on commercialization of agriculture on women headed households since they will have to purchase food from the market to bridge the gap of household food requirements despite the fact that they were the most disadvantaged in terms of off-farm income levels. The above scenario is likely to keep FHHs into a poverty trap with serious negative consequences on the present and future welfare of all members of households.

CONCLUSION AND RECOMMENDATIONS

Generally, female headship is significantly increasing in many rural parts of Rachuonyo and Homa Bay districts, especially in areas of low economic potential (marginal areas). This has been attributed to an increasing number of *de facto* female headed households (temporary FHHs) as men out-migrate in pursuit of off-farm employment to supplement inadequate and unreliable on-farm incomes. Because such households realized low agricultural production when compared to male-headed households, where farm decisions are made jointly or by the male heads, addressing food security has remained critical in many FHHs as they are trapped in a vicious cycle of low production. Female heads were less educated, cultivated smaller pieces of land and were

less endowed by capital which constrained production compared to male heads and therefore achieved low production. These, coupled with traditional gender responsibilities of women resulted in inefficient (technical) agricultural production and made it difficult for FHHs to pull out of the existing low production trap.

To effectively address agricultural productivity and food security in marginal areas, policies and efforts which will reverse the present trend of increasing *de facto* households should be pursued to minimize the proportion of FHHs in such regions in the short run. This could be achieved through the creation of off-farm income generating opportunities such as small scale enterprises and local labour employment in government projects such as access road construction. This would supplement unreliable farm production income within the rural areas which is the major motivational factor behind temporal out-migration of male partners to urban centres. In the long run, policies that support FHHs access to credit, education and land should be pursued to increase their ability to competitively engage in agricultural production. Similarly, donors, researchers and extension workers involved in rural development projects and programmes in regions of low economic potential must target specifically such vulnerable FHHs in order to reverse food insecurity trends, poverty and unemployment.

Low productivity of labour in marginal areas is partly due to low utilization of external supplementary farm inputs by smallholder farmers. Policies which increase access to cheaper external farm inputs, fertilizer, certified seeds and promotion of drought tolerant crops such as cotton will increase the gross value of outputs at household levels, especially FHHs. The government needs to target these households specifically in marginal areas with strategies which shall encourage the use of inputs which enhance farm

productivity.

Since targeting individual households requires expansive and costly programs, FHHs need to form groups to receive assistance from donors and other service providers working in the area. These formal groups will be able to access services including credit where they act as guarantors and this will remove barriers to credit information, increase credit access and investment in agricultural production and improve

production and productivity of FHHs farms. Similarly, targeting FHHs groups with extension services will compensate for the low level of education amongst FHHs. Also, the intensification of adult education programs amongst the FHHs will enable women to learn to read and write and this will increase their ability to access and utilize information.

REFERENCES

- Auma, J.O. 2008. Gender Differentials in Agricultural Production and Productivity in Smallholder Farms: Evidence of Marginal Zones of Rachuonyo and Homa Bay District, Kenya. Unpublished MSc. Thesis, Egerton University, Njoro, Kenya.
- Bett, H.K. 2006. Intra-household Resource Allocation Decisions and Poverty Status Linkage in Selected Rural District in Kenya. Unpublished Msc Thesis, Egerton University, Njoro, Kenya.
- Bush, R., L. Cliffe and V. Jansen. 1986. The Crisis in the Reproduction of Migrant Labour in Southern Africa. In: P. Lawrence (Ed.), World Recession and Food Crisis in Africa. London, UK: James Currey.
- Chipande, G. H. 1987. Innovative Adoption among Female-headed Households: The Case of Malawi. *Development and Change*. 18: 315-27.
- Cliffe, L. 1978. Labour Migration and Peasant Differentiation: Zambian Experiences. *Journal of Peasant Studies*. 5(3).
- Due, J. and C. H. Gladwin. 1991. Impacts of Structural Adjustment Programs on African Women Farmers and Female-headed Households. *American Journal of Agricultural Economics*. 73(5): 1431-1439.
- FAO. 1998. Rural Women and Food Security: Current Situation and Perspectives. Food and Agricultural Organizations of the United Nations, Rome, Italy.
- FAO. 1997. Technical Notes for Country Nutrition Profile (ESNA): Food and Agricultural Organization of the United Nations, Rome, Italy.
- Government of Kenya. 1992. Ministry of Planning and National Development. Gender and Employment in Kenya: Analysis of the 1988 Rural and the 1986 Urban Labour Force Survey.
- Government of Kenya. 1999. Central Bureau of Statistics (CBS). Crop Focus Survey. Ministry of Planning and National Development, Nairobi, Kenya.
- Government of Kenya. 2004. District Agricultural Annual Report, Homa Bay and Rachuonyo Districts.
- Government of Kenya. 2007. Central Bureau of Statistics (CBS): Economic Survey.
- Haleh and Carolyne Denis (Eds.). 1992. Women and Adjustment in the Third World.
- Kimira-Oluch Smallholder Irrigation Development Study (KOSHIDS). 2005. A Feasibility Study Survey by the Lake Victoria Basin Development Authority and Consulting Firm.
- Murray, C. 1981. Class, Gender and the Household: The Development Cycle in Southern Africa. *Development and Change*. 18: 235-250.
- Neupane, R. P. and Thapa, G. B. 2001. Impact of Agro-Forestry Intervention on Farm Income under the Subsistence Farming System of the Middle Hills, Nepal. *Agroforestry Systems*. 53: 32-37.
- Orvis, S. 1995. Men and Women in a Household Economy. Evidence from Kisii. Working Paper No. 432, Institute of Development Studies. University of Nairobi, Kenya.
- Quisumbing, A. R. 1995. Gender Differences in Agricultural

Productivity: A Survey of Empirical Evidence. Discussion Paper No. 5. Washington D.C.: World Bank.

Saito, K., H. Mekonnen and Spurling, D. 1994. Raising the Productivity of Women Farmers in Sub-Saharan Africa. Discussion Paper 230. Washington, D.C.: World Bank.

Udry, C. 1995. Gender, Agricultural Production and the Theory of the Household. Department of Economics, Northwestern University, U.S. A., Evanston, IL.

UNDP. 2002. Human Development Report (Kenya). Institute of Development Studies.

2 . . 2 . . 1 . .

125

%38

1
2
2010/4/5 2009/8/9