International Scholars Journals

African Journal of Agricultural Economics and Rural Development ISSN 2375-0693 Vol. 7 (2), pp. 001-010, February, 2019. Available online at www.internationalscholarsjournals.org © International Scholars Journals

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Full Length Research Paper

Livelihoods and rural wealth distribution among farm households in western Kenya: Implications for rural development, poverty alleviation interventions and peace

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Accepted 17 December, 2018

The study examined livelihoods and wealth distribution among farm households in western Kenya. Stratified random sampling was used to select 252 households from eight districts. Focus group discussions were used to collect complementary community-level data. Results indicate that average household size was seven persons. The cropping system was over 70% mixed. Agriculture was the main source of livelihoods. Labour was mainly allocated to crop enterprises, with household heads allocating > 50% of their labour to it. Maize (*Zea mays*) and common beans (*Phaseolus vulgaris*) were the most important staple/traded food crops. Poultry, followed by cattle dominated livestock enterprises. Few households diversified into small businesses, employment and artisan to enhance livelihoods. Despite this, 5 – 95% of people remained food insecure. Lack of cash and limited land access were the most important factors constraining agricultural development. Although, most households preferred selling produce in markets where prices were better, many not only sold produce but purchased inputs from nearest towns due to high costs of accessing better price markets. Wealth inequality among households was very high, with household wealth *Gini-coefficient* of 0.52 and per capita wealth *Gini-coefficient* of 0.55, calling for better interventions targeting to reach most vulnerable/marginal groups and create all-inclusive opportunities.

Key words: Livelihoods, wealth distribution, *gini* coefficient, Lorenz curve, rural inequality, Kenya.

INTRODUCTION

Due to economic pressure, the increasing risks associated with agriculture as a result of climate change and the inability of many rural farm households to meet basic needs (foods, clothes, and housing), some household members often search for alternative means of livelyhoods (e.g., off-farm activities) to cope instead of tenaciously holding on to farming – behaviour in line with the concept of livelihoods diversification. Under this survival strategy, although farming activities remain crucial, rural dwellers must look for diverse opportunities to increase and stabilize their income for long-term sustainable livelihoods and improved welfare.

Many factors including, but not limited to, sources of economic benefits and supportive institutions constitute the livelihoods activities of a people. All activities that positively influence livelihoods are included. Livelihoods changes occur for a number of reasons and often catalysed and shaped by government policy. The farming systems approach recognizes diversity of the livelihoods of poor farmers, pastoralists and fishing communities and provides a framework for exploring various pathways that may offer an escape from poverty. Close links exist between natural resources and the livelihoods of communities. About 70% of the poor in developing countries live in rural areas and directly or indirectly derive livelihoods from agriculture, especially in countries where hunger is most prevalent (Ellis, 1999). Public investment in infra-

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structure agricultural research, education, extension and improved technology delivery is needed to stimulate private investment, agricultural production and productivity as well as resource conservation. But actual public expenditures on agriculture and rural development in developing countries do not often reflect the importance of the sector to national economies and livelihoods of a large chunk of the population. In contrast, government expenditures on agriculture come closest to matching the economic importance of the sector in countries where hunger is least prevalent (Ellis, 1999). Rural communities have not benefited from privatisation of infrastructure unlike their urban counterparts and there is little evidence of effective use of public private partnerships to provide new rural infrastructure (Ellis, 1999).

Considering the diversified nature of livelihoods in Kenya, this study aims at examining livelihoods (activities, assets, etc.) and wealth distribution among rural households in western Kenya. It is based on the hypothesis that 'proper understanding of livelihoods |activities and wealth distribution will offer a good entry point for informed recommendations on interventions to boost rural wealth, economic growth and welfare.

MATERIALS AND METHODS

Study area

This study was carried out in eight districts selected from the three provinces (Western, *Nyanza*, and Rift valley) in Western Kenya, one of the most densely populated areas of sub-Saharan Africa with a high level of hunger and extreme poverty. Population density has been described as a stressor that may induce shifts in livelihood strategies (Tittonell, 2008). Potable water, paved roads, electricity, and most other infrastructure are all scarce in western Kenya. Over 21% of the region's children < 5 years of age are malnourished and underweight. Adult HIV/AIDS prevalence rate is estimated at 30%, resulting to numerous deaths, a large pool of orphans and several child-headed homes. However, western Kenya has favourable conditions for agricultural (especially crop) pro-duction: a bimodal rainfall regime and relatively deep soils dominated by inherently fertile clay and loam textures (Tittonell, 2008). This notwithstanding, western Kenya is also characterized by subsistence farming, low crop yields, and low household incomes (Kelly et al., 2003). Average farm sizes are in the neighbourhood of 0.1 hectares. While rural families may adapt to such stresses through different coping strategies, there are thresholds in resource endowment (e.g., land size) below which most families are forced to step-out of agriculture as their main activity (Tittonell, 2008).

The elevation in western Kenya varies from 1134 m above sea level (asl) on the shores of Lake Victoria to 2700 m asl in the highlands. The climate is generally mild with minimal monthly variation in air temperatures between 19 and 25^{O}C. Daily temperatures, however, range from 15 to 30^{O}C. Rainfall is governed by a modified equatorial climate characterized by long (March–June/July) and short (September–December) rains.

Western Kenya was chosen for the study because the provinces, especially *Nyanza* and Western have the highest incidences of food and abject poverty in Kenya - more so livelihoods activities and status are related to poverty. Three out of five hard-core poverty districts (with 50% of their population living in hardcore poverty) are found in this region.

Sources of data

Primary data were collected (using questionnaire) from rural households. Topics covered included: socio-economic characteristics, crop enterprises and commercial indexes, income from crop enterprises, livestock enterprises and commercial indexes, income from livestock enterprise, off/non-farm activities and commercial indexes, income from off/non-farm activities, other livelihood assets, food security (availability, access, and stability), health and income security, household welfare, and uses of household wealth (especially income). Secondary data were collected from literature, agricultural institutions, and the Internet.

Method of data collection

Stratified random sampling was used to select 252 farm households from eight districts (*Bungoma*, *Uasin Gishu*, *Busia*, *Siaya*, *Teso*, *Migori*, *Trans-Nzoia* and *Butere-Mumias*) out of 37 districts in western Kenya. Stratum one was used to select eight out of the 37 districts while stratum two was used to ensure the inclusion of male- and female-headed households. Focus group discussions were used to collect community-level data for complementing household-level data.

Analytical procedure and models

Data analysis was performed using SPSS (Statistical Package for Social Science, version 11.5), SAS (Statistical Analysis System, version 8), and Microsoft Excel (also used for data management).

Regression model

A multiple linear regression model was fitted to see whether and how a vector of independent variables [socio-economic and demographic (age of head of household, gender of household head, farm size, number of years in school by head of household, crop enterprise diversification, livestock enterprise diversification, expenditure on food items, expenditure on non-food items, farm income, off/non-farm income, whether or not cultivate cash crops, etc.)] re-late to wealth (a dependent variable). Multiple regression proce-dures are very widely used in research in social and natural sciences. We adopted multiple linear regression analysis in order to know which independent variable is the best predictor of household wealth in the study area.

The dependent variable (Y) takes on wealth computed as a continuous random variable. The implicit function is stated as follows:

$Y = f(X_i, \ )$, where
Y = Wealth (in value terms)
X_i = A vector of socio-economic and demographic characteristics (e.g., age of head of household AGE, gender of household head GENDER, farm size FARMSIZE, number of years in school YRSCH, household size HHSIZE, crop enterprise diversification CEDIVERS, livestock enterprise diversification LEDIVERS, expenditure on food items EXPFOOD, expenditure on non-food items EXPNFOOD, farm income FARMINC, off/non-farm income NFARMINC, whether or not cultivate cash crops CASHCROP, etc.)

= the error term

The expected signs for the independent variables are: AGE (+), GENDER (+), FARMSIZE (+), YRSCH (+), HHSIZE (+–), CEDIVERS (+), LEDIVERS (+), EXPFOOD (+), EXPNFOOD (+), FARMINC (+), NFARMINC (+), CASHCROP (+).

Economic status, age and gender have been noted to be among the most important factors that lead to differences in wealth and play a critical role in shaping opportunities to sustain or improve livelihoods (Brock and Harrison, 2006). The proportion of the poor increases as the level of dependency rises and the youth, the old and large households are more likely to be poor (IMF, 2000a; IMF, 2002).

RESULTS AND DISCUSSION Socio-economic

characteristics of the households

Household size in the survey area ranged from 6.0 (in *Bungoma* district) to 8 (*Butere-Mumias* district) with a mean of 7 persons across districts. The age of the heads of the surveyed households ranged from 43 years (*Bungoma* district) to 53 years (*Trans Nzoia* district) with a mean of 47 years across districts. The number of years that the heads of households spent in school ranged from 7 (*Teso* district) to 11 (*Bungoma* district) with mean of 9 across districts (implying limited formal educational attainment). Food insecurity status (number of persons in the community whose value of food per day is below US$1) ranged from 5 to 95% (with a mean of about 69%) and slightly differs between men (63%) and women (72%).

Primary activities of households

Agriculture (crop and livestock farming) accounts for 96% of the activities of the households, providing employment to 74% of the males and 78% of the females. Trading (especially fish trading) and business were the important off/non-farm activities and accounted for the balance (4%) of the activities of the households. Apart from farming, small businesses such as fish trading (according to 56% of respondents), followed by formal employment (24%), artisan (17%), and sale of labour (3%) are the other important sources of income. Fish trading seems to be thriving as members of the rural communities take advantage of Lake Victoria, the largest freshwater lake in Africa and the world's second largest freshwater lake after Lake Superior in USA-Canada.

Rainy seasons, cropping and livestock systems

Western Kenya observes two rainy seasons in a year and hence two cropping seasons. The first, also referred to as the 'long rainy season' (LR for short), lasts from March to June/July. The second, also known as the 'short rainy season' (or SR for short), lasts from September to December. The LR rains are much more reliable than the SR rains.

On account of all crops grown by the households, the LR and SR seasons' cropping systems were evaluated. Results indicate that farmers mostly practiced mixed cropping. Although sole cropping could be found, it was generally unpopular during both LR and SR seasons, especially the former. For instance, while only about 2.4% of the households were involved in sole cropping during the LR, the corresponding value for the SR was 24.2%. With respect to mixed cropping, while about 98% of the households were involved in it during the LR (ranging from 93% for *Bungoma* district to 100% in *Busia*, *Siaya*, *Teso*, *Migori* and *Butere-Mumias* districts), the corresponding value during the SR was 76% (ranging from 17% in *Uasin Gishu* to 98% in *Migori*). The probable reason for the involvement of more households in sole cropping during the SR is the higher risk of crop failure due to the more likely occurrence of dry spell or drought. This provides a way through which farmers try to cope with high crop production risk during the SR. The crops often given more attention during the SR are the ones that farmers consider to be more tolerant to drought (e.g., cassava, sweet potatoes, and soybean).

Across districts and seasons, the number of crops in crop combination ranged from two to 10 (with a mode of five). The most important crop in the numerous crop combinations was maize (*Zea mays*) followed by common beans (*Phaseolus vulgaris*). Others were soybean (*Glycine max.*), groundnut (*Arachis hypogea*) and cassava (*Manihot spp.*) in that order. Farmers cultivated a total of about 44 different crops comprising of cereals [maize, sorghum (*Sorghum bicolour* (L.) Moench), finger millet [Eleusine coracana (L.) Gaertn], and wheat (*Triticum* spp.) in decreasing order of popularity], grain legumes [common bean, soybean, groundnut, cowpea (*Vigna unguiculata*), Bambara groundnut (Vigna subterranean (L.) Verd, simsim, green grams, peas, and red grams in decreasing order of popularity], and roots and tubers [cassava, sweet potato (*Ipomoea batatas* (L.) Lam, Irish potato (*Solanum tuberosum* L.), arrow roots or cocoyam (*Colocasia* spp.) and yam (*Dioscorea spp.*) in decreasing order of popularity]. Other groups of crops were the traditional cash crops [sugarcane (*Saccharum officinarum* L.), tobacco (*Nicotiana tabacum* L.), coffee (*Coffea* spp.), sunflower (*Helianthus annuus* L.), cotton (*Gossypium hirsutum* L.), and tea (*C. sinensis* (L.) O. Kuntze in decreasing order of popularity], fruits and nuts [banana (*Musa spp.*), pineapple (*Ananas comosus* (L.) Merr.), avocados (*Persea americana* Mill.), macadamia/Monkey nuts (*Macadamia* spp.), passion fruits (*Passiflora edulis* Sims), watermelon (*Citrullus vulgaris* L.) and mangoes (*Mangifera indica* L.) in decreasing order of popularity], vegetables and condiments [tomato (*Lycopersicon esculentum* Mill.), kales (*Brassica oleracea* L. convar. Acephala (DC.) Alef. Var. sabellica L.), onions (*Allium cepa* L.), cabbage (*Brassica oleracea* L. convar. Capitata (L.) Alef. var. capitata L.f. alba DC.), hot chillies/pepper and *kunde* in decreasing order of popularity] and others [Napier grass (*Pennisetum* spp.), trees, lablab and *Makuria* in decreasing order of popularity]. Overall, maize was by far the most popular crop grown followed by beans and soybean (presently being promoted in the area). Maize, beans and soybean are increasingly becoming cash crops in the study area.

Table 1. Proportion of households owning cattle and poultry.

District	Cattle type[#]					Poultry
	Local cow	Improved cow	Heifer	Steers	Calves	
Bungoma	23.3	4.7	18.6	16.3	18.6	79.1
Uasin Gishu	36.7	56.7	36.7	26.7	73.3	93.3
Busia	40.5	16.7	28.6	7.1	26.2	85.7
Siaya	61.9	0.0	42.9	23.8	42.9	90.5
Teso	31.3	0.0	18.8	18.8	25.0	100
Migori	55.3	2.1	14.9	40.4	44.7	97.9
Trans-Nzoia	22.6	48.4	25.8	3.2	51.6	64.5
Butere-Mumias	45.5	13.6	9.1	13.6	45.5	45.5
Across districts	**39.3**	**17.9**	**23.8**	**19.4**	**40.1**	**82.1**

[#]Each cell's percent value was determined by expressing households that owned as percent of all surveyed.
Source: Survey data, 2006.

The most important food crops

Maize (mentioned by 90% of communities surveyed) and beans (64%) were by far the most important food crops in the area. They were also the food crops most traded by farmers. Other traded food crops were cassava (18%), vegetables (8%), finger millet and sorghum (4% each), and sweet potatoes (3%).

The most important cash crops

Even though the world market price for many traditional "cash crops" has been on the decline (due to globalisation and liberalization) over many years, many farmers in the study area still regard such "cash crops" as important for cash. The most important of these is sugarcane. However, a closer look at the real cash income attributes of the traditional cash crops and comparing these with the traditional food crops show that "food crops" such as maize, beans and even soybean now offer farmers more cash income than the traditional "cash crop", many of which no longer bring cash. Farmers who still regard some of those traditional cash crops as cash crops are merely living in the past.

The most important livestock

In terms of number of farmers, not tropical livestock unit (TLU), although there was a wide disparity among the districts, poultry was the most widespread livestock owned by households. The proportion of households that owned poultry ranged from about 46% (in *Butere-Mumias* district) to 100% (*Teso* district) with a mean of about 82% across districts (Table 1). Cattle, goat and sheep, in that order, were the other widely owned livestock. Table 1 also shows the extent of ownership of different types of cattle among households by district. It ranged from about 18% (for improved cow) to about 40% (for calves). Mean numbers of different cattle types (local cows, improved cows, heifers, steers, and calves) owned by different number of owners was low in most cases, ranging from 1.9 (heifer/calves) to 3.2 (improved cow). Apiculture (practiced by 5% of households, mainly from *Bungoma*, *Uasin Gishu*, *Trans-Nzoia*, and *Butere-Mumias* districts.) did not yet seem to be popular.

Household labour allocation

As in other parts of Africa, labour is an important household asset among farm families in western Kenya. Household heads, spouses and adult children were examined to determine allocation of labour to crop production, livestock production and off/non-farm activities. Following Chianu et al. (2004), this was ascertained using proportional piling. Results (Table 2) show that while both household heads and spouses allocated over 50% of their labour to crop production both allocated about one quarter of their labour to livestock production. Although adult children allocated about 30% of their labour to crop production, a large proportion of their labour (49% for adult male children, 61% for adult female children) was allocated to off/non- farm activities. Live-stock production also suffered with respect to allocation of the labour of the adult children, especially by the females who allocated an average of 10% of their labour to livestock production. Labour allocation between farm and off-farm activities (column IV) indicates that the head of the household and his spouse devoted an average of 75% of their labour to farm activities leaving only an average balance of 25% for off-farm activities. On the contrary, the adult male and female children allocated an average of 55% of their labour to off-farm activities. In other words, while the head and his spouse tend to be hanging-in on subsistence agriculture, the adult children tend to be stepping out of farming with respect to their labour allocation.

Ownership of farm machinery and equipment

None of the households owned tractor or farm workshop

Table 2. Mean farm household labour allocation (%) to different enterprises.

Household member	Enterprise	Mean labour allocation (%)	% Labour allocation: farm vs. off-farm
Head of household:	Crop production	58	
	Livestock production	21	79
	Off/non-farm activities	21	21
Spouse of household:	Crop production	52	
	Livestock production	19	71
	Off/non-farm activities	29	29
Adult male children:	Crop production	31	
	Livestock production	20	51
	Off/non-farm activities	49	49
Adult female children:	Crop production	29	
	Livestock production	10	39
	Off/non-farm activities	61	61

Source: Survey data, 2006

Table 3. Proportion of households that owned different farm machinery*.

Machinery/equipment	Households owning it (%)
Cultivation and harvest tools	88.3
Bicycle	85.5
Wheelbarrow	62.3
Livestock shed	54.5
Sprayer	36.4
Farm buildings	21.1
Plough	20.8
Cart	9.1
Grains mill or Sheller	2.6
Vehicles (truck, car, etc.)	1.3
Other machinery	3.9
Others (tractor, farm shop, etc.)	0.0

*Households that responded is 76 for bicycle, farm buildings and other machinery but 77 in all other cases. Source: Survey data, 2006.

(Table 3). One to 10% of them owned vehicle, mill/Sheller or cart. Between 20 – 37% owned plough and sprayers. Farm machineries commonly owned by households were cultivation and harvest tools (88% of respondents), bicycle (86%), wheelbarrow (62%), and livestock shed (55%).

Wealth index, computed based on ownership of farm machinery and equipment, indicated that about 92% of the households can be described as machinery/equipment-poor. Only the balance can be said to be machinery/equipment-rich. In order of popularity, the "cash crops" commonly invested on in the study area were banana (76% of households), fruit trees (62%), sugarcane (51%), coffee (15%), and tea (2%).

Although Tea and Coffee are important export crops in Kenya, these were not popular in the study area unlike in Central Kenya. Sugarcane has been reported to occupy about 75% of the arable lands in districts such as *Butere-Mumias* and *Migori* (Reuben Omondi, personal communication). However, many farmers are getting discouraged because this so-called "cash crop" no longer brings cash due to the depression in the world market price of sugar accentuated by globalisation. Some farmers have removed some of the sugarcanes to make room for other short duration crops (such as soybean) with high cash-income generating potentials. In a decreasing order of importance, other constraints to sugarcane production include: delay in the payment and harvest of sugarcanes by Sugar companies (monopolists in area) as well as over billings of farmers by Sugar companies for services (e.g., supply of inorganic fertilizers, provision of transport, and provision of labour for different sugarcane farm operations). All of these depress farmers' profit. Accord-ing to 80% of the respondents, pests and diseases are the major constraints to banana production. Other minor banana production constraints include lack of market (7%), lack of inputs (seedlings, land, capital, etc) (5%), drought (4%). With respect to fruit trees, pests and diseases are again the most important constraints (56% of respondents). The next most important constraints to the production of fruit trees are lack of market (13%) and lack of inputs (12%).

Purchase of farm inputs and equipment

Three purchasing points (village, nearest town, and distant town) were considered. Results show that about 81% of households purchased their farm inputs from nearest towns with other sources accounting as follows: 15% for village and 4% for nearest town. This shows that farm inputs are generally not within an easy reach of households. It would have been excellent if most of the inputs

Table 4. Means of transporting farm produce to the market.

Means of transport	Ranking of different means of transport	
	First most important (%)	Second most important (%)
Own vehicle	3.9	1.0
Hired vehicle	4.4	10.3
Public transport	17.1	10.3
Bicycle	61.5	29.9
Donkeys	0.4	4.1
Potters	1.3	5.2
Head load	11.4	39.2
Effective sample size (n)	***228***	***97***

Source: Survey data, 2006.

were sourced from the village for reduced transaction cost due to associated savings in transport cost. Lack of the opportunity to source inputs from within the village also has negative implications on productivity, livelihoods and rural poverty.

Marketing of farm produce

Marketing is an important aspect of livelihoods. Based on the distance from farm gate, the marketing points considered were 'at the farm' (where crops were marketed on farm), 'village' (crops have been transported to owners' house and sold within village), 'nearest town' (outside the farmers' village), and 'far away' (>30 km from farm gate). In order of popularity, households sold their produce in the nearest town (47% of households), at the farm (31%), in the village (20%), and further away (2%). This implies that over half of produce sold was sold within the area of production (farm/village) and shows that households had limited access to high price and remunerative markets, often located away from rural areas. Only few households went far to sell produce, probably because of high marketing costs or lack of desire to search for new market opportunities. Unfortunately, local markets are often associated with low profit due to low produce prices in the face of high input costs, given that most of the inputs are sourced from urban markets. This reduces the probability of farm household escape from poverty.

Transporting farm produce to market

Bicycle was by far the most important means of transporting farm produce to market (noted by 62% of households) . The other important means of transport were public transport (17%) and head load (11%). Donkeys, potters, own vehicle and hired vehicles were infer-quently used (column I, Table 4). Dominant use of bicycle followed by head load (column II, Table 4) further explain why only 2% of households sold their farm produce in far away markets and explain how limited access to efficient means of transport negatively affects increased income opportunities for the farm households as they continue to obtain low prices selling in rural circles with limited demand and overwhelming supply of similar commodities.

Decision on farm produce selling point

Survey households were asked whether they used price differences to decide where to sell farm produce. Across districts, while about 75% of the households tried to sell where price was highest, about 17% do not normally observe prices. For about 8% of the households, although they were aware of price differences between selling points they still did not bother to try to benefit from such knowledge because of high cost of transport (58% of subset of respondents), low level of production (24%), lack of time (12%), and price fluctuation (6%). This confirms that farm households are generally rational and take advantage of opportunities where prevailing circumstances permit.

Welfare of household members

This was articulated based on household financial expenditure, wealth and per capita wealth. How a household expends its financial resources (or household expenditure items) often indicates what it considers important and gives attention. The result of a rank evaluation of 12 items of expenditure conveniently grouped into three classes: (i) household welfare-related (paraffin, food, firewood), (ii) social and health-related (medical and health, social contributions, school fees, entertainment), and (iii) agricultural development-related (land preparation, farm labour, inorganic fertilizers, organic fertilizers) indicates that agriculture-related expenditure items or activities started coming in only from the fifth rank. More households gave priority to household welfare-related issues (e.g., paraffin and food) with an average rank of 4.3 and

Table 5. Major items of expenditure among households.

Item of expenditure	% of households that expended money on item[&]	Rank	Average rank[$]
Paraffin	78.6 (198)	1st	
Food	77.4 (195)	2nd	
Firewood	43.3 (109)	10th	
			4.3
Medical and health	77.4 (195)	2nd	
Social contributions	72.6 (183)	4th	
School fees	57.9 (146)	8th	
Entertainment	37.7 (95)	11th	
			6.3
Land preparation	71.8 (181)	5th	
Seeds and other planting materials	66.7 (168)	6th	
Farm labour	63.9 (161)	7th	
Inorganic fertilizers	45.6 (115)	9th	
Organic fertilizers	27.4 (69)	12th	
			7.8

[&]Figures in parenthesis are number of respondents out of 252; [$]Average across items in expenditure group. Source: Survey data, 2006.

Table 6. Proportion of total household wealth contributed by different sources.

Wealth source	Mean contribution (%)[#]	Standard deviation	Minimum (%)	Maximum (%)
Annual crops	43.0 (249)	26.6	0.24	100
Livestock	18.9 (161)	14.75	1.76	70
Value of farm machinery	15.5 (232)	20.95	0.10	90
Perennial crops	10.0 (098)	10.94	0.04	48
Rent (land, etc.)	4.4 (034)	5.0	0.63	19
Off/non-farm activities	3.4 (027)	5.21	0.13	27
Other activities	4.8 (223)	11.48	0.04	100

Source: Computed from survey data, 2006. [#] Values in parenthesis are effective sample sizes

social and health-related issues (e.g., medical/health and social contribution) with an average rank of 6.3 than agricultural development-related issues (e.g., organic fertilizers, inorganic fertilizers, and farm labour, in that order) with an average rank of 7.8 (Table 5).

The apparent lack of priority to agricultural investment explains why food purchases ranked second in a community where agriculture (crop and livestock farming) accounts for 96% of the activities of the households, providing employment to 74% of the males and 78% of the females. Agriculture was also noted to be the major source of cash income among farm households. The result presented in Table 5, therefore, signifies that farmers tend not to give priority to agricultural development when investing funds mostly derived from the sales of agricultural produce. It also undermines the much spoken about desire to reduce rural poverty, creating an atmosphere for the youth to consistently step out of agriculture. Even within agricultural development- related expenditures, farm households have not prioritized critical farm inputs such as inorganic and organic fertilizers – a situation that has immensely contributed to widespread soil fertility depletion and poverty in the area as in most other parts of sub-Saharan Africa (Smaling and Janssen, 1993; Smaling et al., 1996).

Annual household wealth was computed through the valuation of all crops grown; all livestock, farm machinery, and perennial crops owned; all income from rents, off-farm activities and other sources that do not fall into any of these categories. Per capita wealth was computed for each household, by dividing total household wealth by household size. Results indicate a wide variation in both total household wealth and per capita wealth. Total household wealth ranges from a low value of about 3000 Kenyan Shillings (KShs.) or about US$50 (at current exchange of US$1 = KShs.60) to a high value of about KShs. 4,850,275 (US$80,838) with a mean of about KShs. 269,662 (US$4,494) and a standard deviation of about KShs. 459,372 (US$7,656). Table 6 shows that crops (annual/perennial crops) contributed about 53% of total household wealth, followed by livestock (19%), and value of farm machinery (16%).

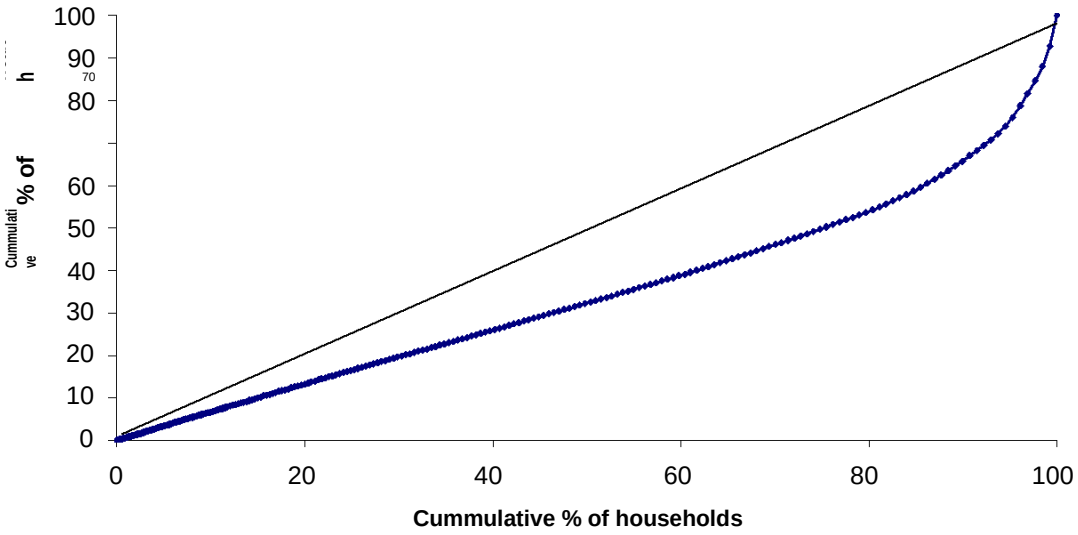

Figure 1. Lorenz curve showing household wealth inequality in western Kenya.

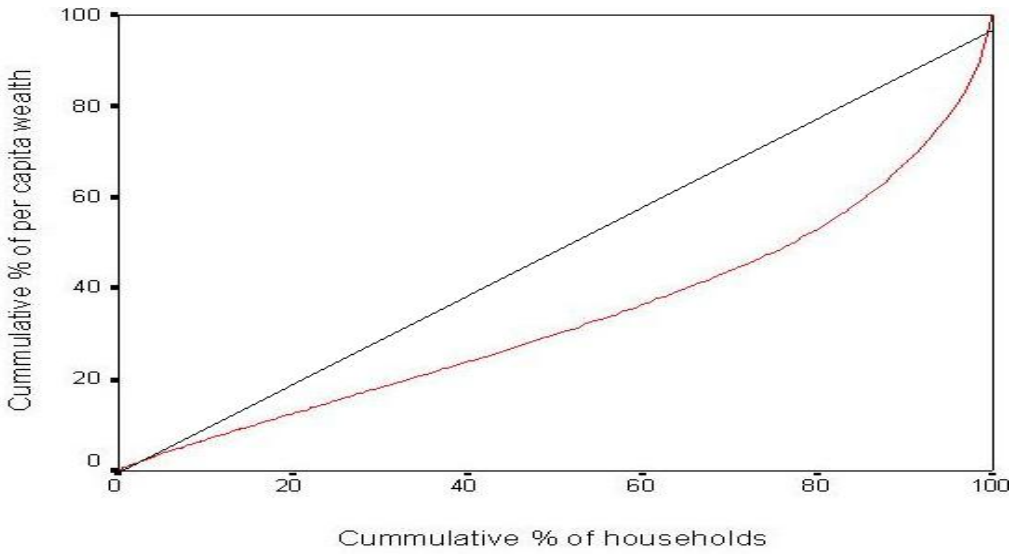

Figure 1. Lorenz curve showing per capita wealth inequality in western Kenya.

An assessment of wealth concentration, based on both total household wealth and per capita wealth indicates a wide rural inequality and a huge differentiation among smallholder farm households in the study area. This is a little bit less pronounced when assessment was based on total household wealth (with a *Gini*-coefficient of 0.52) (Figure 1) than when based on per capita wealth (with a *Gini*- coefficient of 0.55) (Figure 2). A *Gini*-coefficient of 0.52 – 0.55 indicates a high average rural inequality. This result corroborates an earlier finding based on studies carried out also in Kenya in the 1980s and early 1990s (with a *Gini*-coefficient of 0.45) (FAO/World Bank, 2001). In addition, if compared with the *Gini*-coefficient of 0.45 found earlier, this result indicates a widening gap and inequality in wealth among the rural dwellers – the implications of which must be taken serious by rural development agencies involved in the fight against poverty and exclusion.

The poorest 38% of the households (in terms of total wealth) accounted for 10% of the total wealth. When based on per capita wealth the poorest 44% of the households accounted for 10% of the total wealth.

Inequalities have a major influence on the efficacy of growth in enhancing wealth status and also affect how farmers react to new ideas, with rich farmers more likely to be more positive to new ideas than poor farmers. There is the need to pay greater attention to this dimension of wealth creation to complement the impact of ace-

Table 7. Parameters affecting the wealth status of farm households in Western Kenya.

Parameter[&]	Estimate	S.E.	t(19)	Tpr.
Constant	-121875	133563	-0.91	0.373
AGE (age of farmer in years)	743	2604	0.29	0.778
FARMSIZE (farm size in acres)	8260	8730	0.95	0.356
YRSCH (years farmer attended to formal school)	7436	8259	0.90	0.379
HHSIZE (size of household, number)	-1284	6191	-0.21	0.838
CEDIVERS (crop enterprise diversification, No.)	5519	13290	0.42	0.683
LEDIVERS (livestock enterprise diversification, No.)	-17557	18297	-0.96	0.349
EXPFOOD (monetary expenditure: food items)	23.3***	11.8	1.98	0.062
EXPNFOOD (monetary expenditure: non-food items)	-0.241	0.852	-0.28	0.780
FARMINC (total farm income: LRcrop+SRcrop+L-stock)	1.365*	0.231	5.90	<0.001
NFARMINC (off/non-farm income)	1.88	3.74	0.50	0.621
CASHINC (income from perennial/cash crops)	0.23	1.70	0.13	0.895

[&]The explanatory variables and their description;

R^2 = 0.81, *Significant at 1% level, **Significant at 5% level, ***Significant at 10% level.

lerating growth, particularly by enhancing the income earning opportunities for the poor more than for other income-earning segments, or by enabling their greater participation in rural development and growth process.

Regression analysis

Table 7 contains the result of a multiple linear regression analysis with total farm wealth (articulated in monetary value and computed as a continuous random and numeric variable) as the response variable (Y). Although, taken together, the independent variables explained about 81% of the variation in the dependent variable, only two (EXPFOOD at 10% level and FARMINC at 1% level) out of the 11 independent variables included in the model were significant (with expected signs) in explaining the variation in the dependent variable. However, all the remaining independent variables, except LEDIVERS and EXPNFOOD, had expected signs. In this model, a one-year increase in age increases household wealth by KShs. 743 (or US$12.4). A one-acre increase in farm size increases household wealth by KShs. 8260 (US$138). An increase, by one, in crop diversification increases household wealth by KShs. 5519 (US$92). EXPFOOD (monetary expenditure on food items), NFARMINC (off/non-farm income), FARMINC (crop and livestock income) and CASHCROP (annual income from perennial/cash crops), in that order, have a weak positive relation with household wealth.

Conclusion and implications

The importance of agriculture (especially crop production) in western Kenya cannot be over -emphasized as it remains the primary activity of most households, receiving disproportionate share of household head's and spouse's labour. Most households embarked on mixed cropping to reduce the risk and impact of crop failure on food, nutriation, and cash security – a strategy that has largely failed to improve the livelihoods of majority of the households because of continued low farm productivity accentuated by harsh production environments. These are characterized by limited access to and use of inputs (especially organic and inorganic fertilizers), limited access to output markets that offer good prices due to high transaction cost (especially transport), poor investment decision making favouring non-agricultural than agricultural spending, and dearth of farm assets to mention a few. These feed into high level of rural wealth disparities and inequalities and call for better targeting of development interventions to reach the most vulnerable and marginal groups and create new income opportunities and desired impact since rural communities are actually heterogeneous, not homogenous as often thought. Otherwise, the increasing tendency of adult children stepping out of farming into off-farm sector will continue unabated. Some of those who remain may tend to cope by increasing their extractive and environmental damaging activities like cutting trees to make charcoal for sale. Besides, without proper targeting, there is a high risk of not reaching the most vulnerable and marginal group because they are not likely to capture untargeted interventions since they are inherently weak in many fronts.

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