

Access to Land, Income Diversification and Poverty Reduction in Rural Kenya

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1. Introduction

1.1 Background and context

Poverty reduction remains one of the greatest challenges facing the Kenyan government today. With an estimated 56 percent of Kenyans currently classified as being absolutely poor (Government of Kenya, 2002), the situation is widespread and continues to afflict larger segments of the population despite efforts to combat it (Manda *et al.*, 2001). This scenario has not only revived poverty reduction as a central development theme (formulation of Poverty Reduction Strategic Papers (PRSPs)), it has further challenged the policy makers to re-assess the viability of current intervention points.

Agriculture has been the focus of poverty reduction strategies in the rural areas (Government of Kenya, 2002). However, rapid population growth and sub-division of land along inheritance lines has resulted in very small farm sizes. Furthermore, in densely populated regions, there is now major concern that land may have become too scarce to make any meaningful contribution to household incomes (Marennya *et al.*, 2003). This land scarcity suggests that agricultural activities may not remain the only, or even the main, source of income and therefore rural households may not climb out of poverty through growth in land productivity alone. Poverty reduction interventions have also inadvertently ignored the great diversity and heterogeneity in asset portfolios across rural households and the range of activities in which they engage to generate incomes.

Burgeoning literature on livelihood diversification across the developing world has pointed to the increasing role of non-farm incomes in poverty reduction (Bryceson, 1996). Therefore exploiting these off-farm opportunities could offer a pathway out of poverty for the rural poor (Barrett *et al.* 2001a). Since many rural households derive livelihoods from some form of non-farm activity, increasing the profitability and range of such activities would improve their livelihoods security and living conditions (Mwabu and Thorbecke, 2001;

Awoyemi, 2004). But expansion of these opportunities is related to the asset status and barriers to entry resulting from inadequate or differential access to markets (Ellis, 2000).

The foregoing discussion raises questions as to whether the non-farm sector is capable of stimulating growth in rural Kenya where small farms dominate. There are questions as to whether policy should focus more on investments in current portfolio of land based activities (such as investments in fertilizers and modern seed) or on human capital investments (such as entrepreneurial training programs, greater access to primary and secondary education and vocational training, and improved health care) that may expand off-farm earnings. This paper seeks to provide an in-depth understanding of the diverse asset holdings of rural households, the activities in which they engage to generate incomes and how these factors affect their poverty status. It is envisaged the results of the study will contribute in the design of anti-poverty initiatives in the rural areas of Kenya where the majority of the population remains poor.

The remainder of this article is organized as follows. The section that follows gives a brief description of the data and definitions of terms used in the paper. Section 3 presents the results that emerge from the analysis of the livelihoods strategies pursued by rural households given their resource limitations. The findings point to existence of significant barriers to entry to remunerative livelihoods both at farm and off-farm level, especially among the resource poor. The last section concludes the paper and provides some recommendations for policy.

2. Data set

Data for this study came from a survey conducted in the months of May and June 2004 in two locations of the neighboring districts of Kakamega and Vihiga in Kenya. These two regions have distinctively different land availability patterns. Shirugu location of Kakamega district, with 433 people per km², has relatively higher per capita land availability, good market

access and recent resettlements. Key features of Maragoli location of Vihiga district (866 people per km²) are higher agricultural potential but relatively small land parcels and poor market access. Information was collected on household assets, income levels, employment status and other household characteristics.

A 'household' was defined to comprise of a group of individuals living in the same house, eating together and contributing to income. This excluded unmarried sons and daughters living away from home, but their contribution to income was captured as remittances. Non-relatives such as employees who reside in the households were included as members but their income was not included in the household income. The definition of income used in the paper is fairly comprehensive and includes both income received in cash and kind. Monetary value was imputed for receipts in kind and household consumption of crops and livestock. For crops grown under rented land, rents paid by these households were deducted from revenues accruing to those particular enterprises. However, family labor used in on-farm crop and livestock production was not valued.

The various components of household incomes were defined as follows: *Crop income* was the net income from all crops produced by a household including values imputed for food consumed at home. *Livestock income* comprised of the net returns from traded livestock and livestock products. This also includes income earned from use of animal draft power and imputed values of home-consumed livestock and livestock products. *Informal wages* were defined as earnings received by household members from informal labor activities (working on other people's farms and in other non-skilled or labor intensive off-farm activities). *Rental income* was income earned from rental property (rented land and buildings). Earnings from pensions and remittances constituted *transfers*. *Self-employment earnings* included profits earned by household members from self-employment, dividends, etc. *Formal wages* were the gross value of wage earnings received by household members who were in regular formal

sector employment in government and the private sector. *Total off-farm income* included all wage earnings from informal labor activities (excluding working on own land), government and private sector employment, transfers, property rent, and profits from self-employment described above.

Descriptive statistics were computed to reveal the characteristics of the study locations and the pattern of household income generating activities. A double log model of household per capita income as a function of characteristics of the household was estimated. A third method used to analyze the data was estimation of a censored tobit model to determine the factors that explain off-farm income.

3.0 Results and discussions

The distribution of assets by study locations shows marked differences in land ownership, ownership of non-land based assets and livestock. Livestock assets were aggregated into a single measure, Cattle Equivalent Units (CEUs), which was computed as mean price ratios of other livestock relative to that of cattle, with weights as follows: cattle = 1; sheep = 0.10; goat = 0.12; pig = 0.07; and chicken = 0.02. The results showed that residents of Shirugu location were better endowed with these assets. For example, household land ownership in Shirugu location is more than four times that in Maragoli location. However, differences in human capital and household sizes are less clear-cut (Table 1).

<Table 1>

3.1 Household income portfolios

Examination of livelihood diversification patterns indicates what the people currently consider to be the most attractive alternative sources of incomes given their resource limitations. This can provide useful insights into the kind of interventions likely to be successful in enhancing their access to assets and reducing their vulnerability to poverty

(Barrett *et al.*, 2001b). Tables 2 and 3 show the composition of total household incomes by study location. The share of off-farm income and its formal wage component in total income is highest in the high-income groups in both locations. Further examination also reveals that the top quintiles have the highest share of formal wage earnings and this is not a feature of the poor groups. The share of formal wage income in total off-farm income is also largest in the top income quintiles. Most households with stable off-farm income also indicated that they used the income to finance on-farm investments, especially in the land-constrained Maragoli Location. Marenya *et al.* (2003) found similar results on the role of education and non-farm income in Madzu Location.

<Table 2>

The low-income groups derive a large proportion of their off-farm income from unskilled informal labor activities (working mainly as farm laborers and bicycle transporters). The share of income from crops is also lowest in the top quintile but increases down the quintiles and is highest in the bottom quintile.

This result shows that the poorer households rely on farming (mostly subsistence) and seasonal labor activities as their main source of livelihood. However, improved access to off-farm opportunities such as self-employment and formal employment can provide them with a means to climb the income ladder to become relatively well-off.

<Table 3>

The high-income households also had higher absolute levels of incomes under all categories except for informal incomes. This appears to be largely as a result of differential ownership or access to productive resources. The differences in income patterns in the two locations appear to be due to differential access to markets.

The shares of off-farm income in total household incomes in the two research locations are significant. The percentage contributions are 50% and 60% for Shirugu and

Maragoli locations respectively. The shares of agricultural (livestock and crop income) to off-farm income for Shirugu is consistent with the 50:50 reported in the region and across Africa (Ellis, 2000; Freeman *et al.*, 2004). However, for Maragoli location, the study findings support Marenya *et al.* (2003) and Oluoch-Kosura *et al.* (2004) assertions that in regions with low per capita land holdings such as Vihiga district, farm production may only offer a modest opportunity as the basis for securing livelihoods, even with intensification. Therefore more and more people must necessarily be absorbed into the off-farm sector both at the local level and beyond if they are to escape poverty. However, the poor face entry barriers to remunerative livelihoods in the off-farm sector, because of low levels of physical and financial assets (Ellis, 2000). The consequence is a downward vicious spiral that entraps them in poverty.

Tables 4 and 5 examine the pattern of income sources by land ownership categories and location. It is worth noting that land size was not adjusted for quality.

Notably, off-farm earnings have the largest share (68%) in the lowest land ownership category in Maragoli location. A similar trend is shown in Shirugu, with the 1st and 3rd land ownership categories having the largest shares. A larger proportion of this appears to accrue from informal labor activities, especially in Shirugu location. Crop income shares are also lowest in the lowest land category in Maragoli (21%) and seem to increase across the land ownership classes. For Shirugu, this pattern is uneven, perhaps because binding land constraint is yet to be felt.

<Table 4>

Livestock income shares are also highest among households falling in the highest land ownership category in Shirugu (where active land markets have emerged) while in Maragoli (thin land markets) the relationship is less clear-cut. Share of income from self-employment is also highest in the lowest land ownership category in Maragoli suggesting that it could be

an entry point in interventions to increase incomes in the land-constrained region. Households with relatively large land holdings had the highest absolute incomes under all categories, except for the informal labor activities. The observed higher absolute off-farm earnings among the households with relatively large parcels of land suggest that off-farm sector, though vital for those with low land holdings, does not differentially compensate for inability to expand farm activities.

There is also less income diversification among the landless (less than 0.5 acres) in the relatively land abundant Shirugu location as compared to Maragoli. Farm wages shares were also higher than informal non-agricultural wages in all the portfolios presented above but the shares were below 10%, except in Shirugu (ownership of below 0.5 acres). This corroborates other findings on the limited scope of off-farm wage labor and labor markets in targeting transfers in the rural areas of Africa (Reardon, 1997). However, the per capita incomes do not appear to exhibit any pattern.

<Table 5>

3.2 Correlates of household per capita incomes

In this part, we estimate a double log model of household per capita incomes as a function of household characteristics. Education level of household head was classified into three education categories, according to the highest education level attained by the household head. For each category, a dummy variable was constructed as 1 if the highest level attained included at least some education at that level and 0 otherwise. Table 6 presents the results.

The results indicate that secondary education and beyond, cultivated land size and value of livestock holdings positively influenced household per capita income in the study locations.

<Table 6>

This result suggest that enhanced access to or accumulation of these assets is likely to raise living standards in the regions. However, household size negatively influences household earnings in study locations.

3.3 Determinants of off-farm earnings

Here, consideration is given to estimation of determinants of off-farm income using a model that would correct for selectivity bias due to exclusion of households with no off-farm income, as the truncation of dependent variable is based on its correlation with the reservation wage and not on the value of off-farm income *per se*. Table 7 reports the findings of the estimated tobit model.

<Table 7>

The results indicate a high return to higher education. Education is important in accessing off-farm opportunities. Age of household head also positively influences the amount of off-farm earnings, perhaps reflecting the influence of assets accumulated overtime on current incomes. Co-efficient of acreage cultivated is negative as expected, but is insignificant. That off-farm income is not correlated with land access is of particular significance, and therefore enhanced access to off-farm sector opportunities can offer land-poor alternative source of livelihoods. The significance of the co-efficient on number of household members participating in the labor market suggests that strategies to enhance human capital such as improved access to health care are paramount in reducing vulnerability to poverty, especially among the poor.

4.0 Conclusions and policy implications

The study explored the income strategies employed by rural dwellers given their assets endowments and how this impacted on their poverty status using micro-data. The results

show that access to productive land is still an important source of income in the rural areas, even where farm sizes are small. The poorer, in the rural areas tend to depend more heavily on food-crop production and seasonal wage labor activities for their incomes and are therefore likely to be vulnerable in face of personal (such as illness) and covariate shocks such as droughts. On the other hand, the relatively well-off had better access to productive assets (such as land and human capital) and used their superior asset endowment to engage in livelihood strategies that offered higher returns and lower risks and are able to escape poverty.

Since the rural poor depend mainly on farming, the immediate course of action must lie in increasing the productivity of the weak natural resource base (mainly soils) via targeted efforts such as in mineral fertilizers, modern seed varieties and extension service and produce markets. However, as the expected returns to land investments decrease with severe land constraints, these on-farm investments must necessarily be integrated with off-farm investments to enable households generate sufficient incomes to escape poverty. The findings suggest need for a more integrative approach to rural development that targets the removal of entry barriers to remunerative livelihoods both at farm and off-farm levels such as expanding education, infrastructure and decentralization to spur broad-based development in the rural areas.

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Table 1: Households' characteristics by study location

Variable	Shirugu (N= 104)	Maragoli (N= 112).
Age of household head (years)	47.63 (14.12)	48.26 (12.6)
Gender of household head M=1, F=0, %	69	68
Household size	6.57 (2.93)	5.94 (2.29)
Formal years of education of h/h head	6.4	6.7
Land owned (acres)	4.88 (4.98)	0.926 (1.063)
Livestock ownership (CEUs)	3.24 (3.66)	1.51 (1.11)
Value of household assets (Kshs.)	67, 117 (131, 358)	36, 272 (130, 426)
Mean total household income (Kshs) ¹	73, 966 (87, 561)	55, 885 (67, 885)

Figures in parenthesis are the standard deviations.

Source: Survey results, 2004.

¹ All income figures in Kenya shillings, 75 Kshs = 1 US Dollar.

Table 2. Share of income sources by income quintiles, Shi rugu location (%).

Income quintile	Formal wages	Self- employment	Transfers	Informal wages	Crop incomes	Livestock incomes	Per capita incomes
I. (20)	36	17	7	0	35	5	34,885
II. (21)	8.4	18	7.6	12	46	8	10,951
III. (21)	0	14	8	13	47	18	5,825
IV. (21)	0	10	8	13	61	8	4,584
V. (21)	0	5	12	14	53	16	1,640
All (104)	23	15	7	5	43	7	11,275

Source: Survey results, 2004.

Table 3: Share of income sources by income quintiles, Maragoli (%)

Income Quintile	Formal wages	Self-employment	Transfers	Informal wages	Crop income	Livestock income	Per capita income
I. (22)	34	9	20	9	16	12	24,455
II. (22)	22	10	12	14	20	22	9,207
III. (22)	4.4	2.1	9.5	14	50	20	5,895
IV. (23)	0	2.9	5.1	21	58	13	3,659
V. (23)	2	1	9	11	71	6	1,883
All (112)	23	8	15	14	26	14	9,419

Source: Survey results, 2004.

Table 4: Income portfolios by land ownership categories (acres), Maragoli (%).

Land ownership	% of households	Formal wages	Informal wages	Self-employment	Transfers income	Crop incomes	Livestock income	Per capita incomes
0-0.5	54.5	26	18	9	15	21	11.0	8,303
0.51-1.0	24.1	19	11	7.7	17.8	30	14.5	8,035
1.01-2.0	14.3	29	15.5	7.5	10.8	25.2	12	10,641
2.01-3.0	2.7	0	0	8.0	29	31	32	13,651
3.01-5.0	3.6	8.8	0	4.5	15.7	36	35	31,040
>5 acres	0.9	63	0	0	0	37	0	11,263
All	100	23	14	8.0	15	26	14	9,419

Source: Survey results, 2004.

Table 5: Income portfolios by land ownership categories (acres), Shirugu (%).

Land ownership	% of households	Formal wages	Informal wages	Self-employment	Transfers	Crop incomes	Livestock income	Per capita incomes
0-0.5	1.9	0	60	0	0	40	0	3,320
0.51-1.0	2.9	0	11	0	33	56	0	1,561
1.01-2.0	25	26	21	17	2	28	6	6,547
2.01-3.0	20.2	21	1	25	4	44	5	16,480
3.01-5.0	21.2	33	3.8	2	4.7	50	6.5	10,935
>5 acres	28.8	17	1.9	18	12	42	9.0	13,209
All	100	23	5	14.8	7	42	7.2	11,275

Source: Survey results, 2004.

Table 6: OLS results of determinants of household per capita incomes

Variable	Co-efficient	Standard error
Constant	8.781***	0.899
Gender	0.199	0.1333
Log Age of Head (years)	0.3422	0.217
Primary and below	0.1807	0.2042
Attended secondary	0.3801*	0.230
Completed secondary and above	1.066***	0.244
Log Non land-based Assets	0.00075	0.0005
Log land cultivated	0.2533***	0.0528
Log value of livestock	0.0004**	0.0002
Log household size	-1.039***	0.1414
Log dependency ratio	-0.0002	0.0002
Adjusted R ²		0.33
F _{10, 205}		11.71***
Log-likelihood		-271.46

a. Dependent variable = natural log of annual household per capita income.

***, ** and * denotes significance at 1%, 5% and 10% respectively.

Source: Survey results, 2004.

Table 7. Censored regression results of determinants of off-farm earnings

Variable	Co-efficient	Standard error
Constant	-62,868**	26556.7
Gender (Male =1, Female=0)	1511.35	10644.64
Age of Head (years)	1007.8**	466.08
Education level (years)	6919.85***	1545.6
Non land-based assets	0.1315***	0.04
Value of livestock owned	0.1106	0.13
Land cultivated (acres)	-382.43	1370.8
Household size	2423	3685.8
Dependency ratio	-23262.54	35149.7
Able workers	-9069.9	6269.7
Emigrants	-166.7	3094
Number of labor participants	25154.25***	5295
Likelihood ration index		0.11
Log-likelihood		-2029.8

a. Dependent Variable: Amount of off-farm income.

Source: Survey results, 2004.

*** and ** denote significance at 1% and 5% levels respectively.