

An Economic Inequality Decomposition Analysis of Rural Poverty in Mbale District, Eastern Uganda

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Abstract: The purpose of this study is to examine rural poverty based on different household socio-economic variables. It also tries to highlight the source of inequality using decomposition of economic inequality indices in poverty ridden rural areas. A household survey was conducted from April to December, 2007 in Nabweya and Bufumbo parish, Mbale district. A total of 116 sample households from Nabweya 60 and Bufumbo parish 56 were randomly selected and interviewed using semi-structured questionnaires. The household level data were collected on various socio-economic aspects and focusing on different sources of income. The coefficient of variation and Gini-coefficient were used to measure the income inequality decomposition. The results show that based on tribe, the Iteso are deprived in terms of education and landholding and therefore, laboring and agriculture remain the prominent source of income for them. Average income from salaried job is the highest followed by remittance and that from laboring is the lowest. This led to the high concentration of Iteso under third and fourth income quartile (poorer). A share of income from agriculture in total income is the highest and the share from laboring is the lowest. Relative concentration coefficient shows salaried job has both the highest income disequalizing effect ($C_i = 1.56$ or $g_i = 1.49$) as well as the highest factor inequality weight followed by agriculture. In case of Bufumbo parish, however, salaried job followed by remittance has the highest income disequalizing effect. Negative values of Relative Concentration Coefficient and factor inequality weight for laboring indicate that income from it has the income equalizing effect. Thus, agricultural promotion in rural areas based on labor-demand increasing policies with proper market arrangements for the agricultural produce will be helpful to reduce the income inequality. In addition, regulation regarding minimal wage rate should be strictly enforced for the welfare of those involved in laboring, which is also the poorest.

Key words: Employment, incomes sources, poverty, rural, Uganda

INTRODUCTION

Poverty remains deep and widespread in poor developing countries and even rampant in some cases. Hence, the issues of poverty and inequality are in the forefront of the global agenda. Uganda being no exception is getting huge amount of foreign aid to meet the goal of poverty alleviation since the start of its planned development effort in 1962 in the name of infrastructure development. Since, the 10 point development programme (1986), poverty reduction programs have been getting top priorities and sharing the significant amount of foreign aid of the Gross National Product. However, the achievements are far below than expected and poverty increased at an annual rate of >3% that almost doubled the number of absolute poor between 1977 and 1996.

Several analyses on poverty made since, 1977 confirm that an income-based poverty is widespread in Uganda (Nuwagaba, 2000). Poverty in the country exists in a wide variation depending on the rural-urban areas, physiographic regions, gender and tribal ethnic groups (UNDP, 2005). This makes poverty complex and diverse, which should be understood thoroughly to achieve the goal of poverty reduction (Nuwagaba, 2000). In addition, poverty incidence, gap and severity analysis of the country suggest that poverty is more rampant, deeper, severe in rural areas and much worse in the highlands/ mountains (UBOS, 2002). Thus, the rural poverty remains the core issue of poverty in Uganda.

In Uganda, the Poverty Eradication Action Plan (PEAP), which is the national framework to reduce poverty to <10% by the year 2017. The PEAP is often referred to as the Poverty Reduction Strategy Paper

among the Brettonwoods Institutions was formulated and adopted in 1997/98 at a time when poverty levels were estimated at about 44% of Uganda's total population. The PEAP believes that poverty reduction will depend on economic growth, which is estimated at 7% average annually. The PEAP is implement through plans for each sector known as Sector Wide Approaches (SWAPs) and the SWAPs are implement through Sector Investment Plan (SIPs) like the Education Sector Investment Plan, Health Sector Strategic Plan and Lands Strategic Sector Plan (MFPED, 2002).

Recent study on poverty of the country, however, revealed a considerable decline in poverty from 42% in the year 1995/96 to 30.8% in the year 2003/04. At the same time it also revealed the increasing disparities between rich and poor, reflected by the increase in value of Gini coefficient for the aggregate consumption level from 0.34 in 1995/96 to 0.41 in 2003/04 (UBOS, 2002). As any successful poverty reduction program often concerns with favorable increase in income as well as, favorable changes in income inequality, this unfavorable change in inequality, therefore, raises question on the success of poverty reduction programs in Uganda (MFPED, 2002).

Today, the most widely adopted poverty line in developing countries is the one prescribed by the World Bank, which has been estimating global income poverty figures based on sample survey of households since, 1990. Poverty lines are calculated on the basis of household consumption expenditure per person. The Bank uses Purchasing Power Parity (PPP) prices to convert national poverty lines to international poverty lines. The median of the lowest ten poverty lines is taken as the poverty line in all developing countries and that line is USD 1.08 generally, referred to as dollar a day. This indicator has some shortcomings and it has been criticized among other things for saying nothing about the structural conditions or the personal states of being of the individuals living in poverty, it captures only goods delivered through the market, it disregards differences in cost of living within counties-between urban and rural areas e.g. and it disregards intra-household distribution of goods and thus, differences in deprivation within households (Shanmugaratman, 2001).

More generally in the developing countries, although, poverty affects both rural and urban populations, the former are most affected. This is because, there are a number of cause-effect factors of poverty that do not encourage development in the rural areas. In Uganda, poverty is more predominant among the following: in the Northern region, among female-headed households, peasant farmers, large households, illiterate and small landholders. More interesting, rural poverty is

in itself not a uniform phenomenon where, even in rural areas\some people are poorer than others for example, subsistence farmers are part of the rural poor yet, they are slightly above the landless and unemployed who are the poorest of the rural poor. Uganda remains one of the poorest countries of the world ranking 158 out of 174 countries in the United Nations Human Development Index. According to the Uganda Participatory Poverty Assessment Report 2002, rural and urban poverty differ a lot because they each have quite different causes.

Such increasing disparity, has serious ramification to maintain a sustainable economic growth as well as to create threats to social stability. The widespread increase in inequality has been detrimental to the objective of poverty reduction. A large rise in inequality stifles growth and thus, poverty at any given growth rate of GDP falls less rapidly in more unequal distribution than in a more equitable one (Cornia, 2004). Therefore, a better understanding of root causes of income disparity has been the most important issue to tackle with the rural poverty (Boardman *et al.*, 2001). This led to increasing interest in the sources of income inequality in poor developing countries. Several empirical studies using various techniques have given a clear insight into the contribution of different sources of income to total income inequality (Brent, 1989). Besides, the decomposition of inequality provides the information useful for policy makers in designing and implementing inequality reducing policies vis-a-vis poverty reduction. Dynamics of the poverty with the change in income sources can also be reflected through the decomposition of income inequality (Wan, 2001). This study, therefore, attempts to examine poverty based on different household socio-economic variables. It also tries to highlight, the source of inequality using decomposition of economic inequality indices in poverty ridden Bufumbo and Nabweya parish, Mbale district, eastern Uganda.

MATERIALS AND METHODS

Study site: The study area, Mt. Elgon National Park (MENP) (1°N and 34°30'E) is situated approximately 100 km Northeast of Lake Victoria on the Kenya-Uganda border. The protected area covers 2045 with 114 km² comprising Mt. Elgon National Park on the Ugandan side. This study was based on information obtained through a questionnaire survey, field observation and group discussions. The household survey was conducted during the months of June to December, 2005. Primary data were obtained through household survey conducted in Nabweya and Bufumbo Parishes, Kapchorwa District.

The criteria for choosing the households were 2 folds: Ethnic background and distance from the park boundary. Purposive sampling was carried out to choose the Sabiny and Bagisu ethnic groups. Stratified sampling according to the distance from the park border was done to choose the villages within each parish. Two parishes namely Nabweya and Bufumbo parish were selected for the study because, Nabweya parish represents the ordinary subsistence parish at the national context having connection with motorable road. In contrast, Bufumbo parish is relatively remote without connection to the motorable road and is accessible only through foot which greatly hinder the development opportunities and the reliable market for its products and essential inputs.

Although, only around 18% land is cultivable due to rugged terrain, about 80% households are adopting agriculture as the main occupation. Service holders rank second and remittance from people working in Kenya also do have vital role in the economy of the district (UBOS, 2002). Being far away from the capital and other major cities of the country, it has not received due share of attention in the development process and governance until very recently. This limits the availability of modern amenities like motorable road, education, health, credit, safe drinking water, electricity and telecommunication to its vast majority population. With this, the district falls under the category of the poorest districts having Human Development Index value of <0.4 (UNDP, 2004).

Data collection: From the general survey of all households in both parishes, the households were stratified into the ethnicity giving due consideration to their asset holding, especially landholding. A household survey was conducted from April-December, 2007 in Nabweya and Bufumbo parish, Mbale district. Out of the total 116 sampled households with more or less similar proportion from each stratum, 60 from Nabweya and 56 from Bufumbo parish were randomly selected and interviewed using semi-structured questionnaire to collect household level data. Questionnaires were designed to collect information on various socio-economic aspects and focusing on different sources of income. Secondary data were obtained from reading policy documents and reports from the local district development reports, Ministry of Finance, Planning and Economic Development, Plan for Modernization of Agriculture (PMA), National Agricultural Advisory Services (NAADS) and other relevant documents.

Data analysis: The concept of relative poverty is taken into consideration for poverty analysis in the study. This concept views income disparities as an indicator of

poverty regardless of set poverty line. It considers, the state of the income distribution among all sample households whether they are below or above the poverty line, unlike the absolute poverty, that totally ignores the state of the income distribution above the poverty line and the poor receive all the weight for analysis (Thorbecke, 2004). When the concept of relative poverty is adopted, inequality is also relevant to the measurement of poverty per se (Kakwani, 1977). Here, the households are divided into four quartiles based on the average per capita annual income.

Accurate measurements of income have generally encountered a series of problems, giving not a single appropriate notion of income for poverty analysis. Therefore, comprehensive concept of income is used in this study, which includes income received in cash as well as in kind (Adams and He, 1995). Total income is divided into 5 main sources of income, namely agriculture, salaried job, business, laboring and remittance. Agriculture includes poultry, animal husbandry and dairying and crop farming. Agriculture being subsistence in nature most of the inputs are self supplied. Labor needs are met by the mutual sharing of household members between households, where as seeds and manures are most often self-supplied. Therefore, no monetary value was imputed for these items in order to prevent the double counting. Income from agriculture includes gross income obtained in cash and kind, for both main crops and their by-products, which are translated into monetary value using average price received by the farmers. Salaried job includes the government and non-government services, teaching, army and police. These all are the regular sources of income. Business income includes the net income from shops, mills, cottage industries and contracting. Income from daily wage such as porter and occupational works like blacksmith, masonry, carpentry, tailoring and goldsmith is categorized under labor income. Most of the migrant works in Kenya are involved in menial jobs, working as, day laborer, watchman, bearer, cook/helper in restaurant and household worker. Very few are also involved in clerical work. Therefore, remittance income represents the income earned outside the country regardless of job kind.

Source of income inequality

Decomposition of inequality indices: Among, the several measures of inequality, Adams and He (1995) have recommended the coefficient of variation and Gini coefficient as the best inequality measures for analysis of income inequality decomposition. Inapplicability of other measures in the case when sources of income are overlapping, where most of the survey households

receive income from different sources, which is the case in this study. This justifies the use of both inequality measures for decomposition analysis. In addition, Wan (2001) based on intensive literature review has, proposed Gini coefficient to be the best measure for inequality decomposition.

Decomposition analysis based on coefficient of variation:

The income source decomposition based on the coefficient of variation developed by Adams and He (1995) is adopted. This method in fact is based on Shorrocks (1982), who translated the variance into the coefficient of variation. This has been done mainly due to inability of variance to meet the relative income principle. Therefore, this measure is popular among the researchers for the analysis of income inequality decomposition (Shorrocks, 1982).

At the first step, relative concentration coefficient of *i*th source of income (C_i) is calculated using Eq. 1. Value of relative concentration coefficient (C_i) determines whether the *i*th source of income increases or decreases the inequality. An income source can be defined as inequality increasing or decreasing based on whether additional increment in *i*th source of income, which are distributed in the same manner as the original units, lead to an increase or decrease in overall income inequality. If the value of C_i is greater than unity, the source of income increases inequality and if it is less than unity, the source of income decreases inequality (Adams and He, 1995). Similarly, *i*th source of income provides a disequalizing effect if $C_i > 0$ and an equalizing effect if $C_i < 0$ (Brent, 1998).

$$C_i = p_i \cdot y(\sigma_i / \mu_i) / (\sigma / \mu) \quad (1)$$

where,

C_i = The relative concentration coefficient of *i*th source in overall inequality.

p_i, y = The correlation coefficient between the *i*th source and total income, σ_i, σ are standard deviation of *i*th source and total income.

μ_i, μ = The mean income from the *i*th source and total income, respectively.

In the 2nd step, proportionate share of income from *i*th source to total income (w_i) is calculated (Eq. 2):

$$w_i = \mu_i / \mu \quad (2)$$

Here, intuitively $\sum w_i = 1$.

Now, $w_i C_i$ gives the proportion of total inequality contributed by *i*th income source (Eq. 3). Here, higher the value of $w_i C_i$, the higher is the *i*th contribution of income source to income inequality.

$$w_i c_i = (\mu_i / \mu) * p_i, y(\sigma_i / \mu_i) / (\sigma / \mu) = \rho_i, y(\sigma_i / \sigma) \quad (3)$$

Here, summation of $w_i C_i$ equals to unity.

Decomposition analysis based on gini-coefficient:

Kakwani (1977) and Shorrocks (1982) worked out for decomposition of inequality using Gini coefficient. Based on Kakwani's equation, Adams and He (1995) applied the Gini coefficient to decompose income inequality arisen from sources of income. Similar to the decomposition analysis based to coefficient of variation, relative concentration coefficient of *i*th source of income (g_i) is calculated following Eq. 4, as the first step. It can be interpreted same as the value of C_i in Eq. 1.

$$g_i = R_i G_i / G \quad (4)$$

Here,

G_i, G = Gini coefficient of *i*th income source and total income, respectively.

R_i = The correlation ratio, which is expressed as (Eq. 5):

$$R_i = \text{cov}(y_i, r) / \text{cov}(y_i, r_i) = \rho_i, r / p_i, r_i \quad (5)$$

where, $\text{cov}(y_i, r)$ is covariance between income from *i*th source and rank of total income, i.e., $\rho_i, r_i * \sigma_i * \sigma_r$, ρ_i, r_i is correlation coefficient between income from the source and rank of total income 0 and or are the standard deviation of income from *i*th source and rank of total income, respectively. Similarly, $\text{cov}(Y_i, r_i)$ is covariance between income from *i*th source and rank of *i*th income source, i.e., $\rho_i, r_i * \sigma_i * \sigma_{r_i}$, ρ_i, r_i is correlation coefficient between *i*th income source and rank of *i*th income source 0 and or are the standard deviation of income from *i*th source and rank of *i*th income source, respectively.

Proportionate share of *i*th income source to total income (w_i) is calculated in the second step and the product of g_i and w_i ($w_i g_i$) has given the proportion of inequality contributed by *i*th income source to the total inequality.

$$\sum w_i g_i = \sum (\mu_i / \mu) * (R_i G_i / G) = 1 \quad (6)$$

RESULTS AND DISCUSSION

Socioeconomic characteristics: Female-headed house hold is higher in remote rural areas of the district. It is higher in case of Bufumbo parish, comprising 19.6% of total household compared to 11.7% in Nabweya (Table 1). The overall proportion (15.5%) is higher compared to the regional figure of 7.4% as in the case of eastern

Table 1: Soci-economic characteristics of households

Variables	Nabweya	Bufumbo	Total
Sex of household head			
Male	53 (88.3)	45 (80.4)	98 (84.5)
Female	7 (11.7)	11 (19.6)	18 (15.5)
Tribe			
Bagishu	25 (41.7)	8 (14.3)	33 (28.4)
Sabiny	30 (50.0)	40 (71.4)	70 (60.4)
Iteso	5 (8.3)	8 (14.3)	13 (11.2)
Education of household head			
Illiterate	8 (13.3)	23 (41.1)	31 (26.7)
Literate	13 (21.7)	17 (30.4)	30 (25.9)
School education	28 (46.7)	11 (19.6)	39 (33.6)
College education	11 (18.3)	5 (8.9)	16 (13.8)
Occupation of household head			
Agriculture	37 (61.7)	32 (57.1)	69 (59.5)
Salaried job	18 (30.0)	8 (14.3)	26 (22.4)
Business	2 (3.3)	5 (8.9)	7 (6.0)
Laboring	3 (5.0)	11 (19.7)	14 (12.1)
Family size category -Adult equivalent*			
Small (1-5 Members)	20 (33.3)	23 (41.1)	43 (37.1)
Medium (>5-10 Members)	31 (51.7)	27 (48.2)	58 (50.0)
Large (>10 Members)	9 (15.0)	6 (10.7)	15 (12.9)
Average Family size	6.3	5.7	6.0
Landholding			
Small (<0.5 ha)	12 (20.0)	21 (37.5)	33 (28.5)
Medium (0.5-2 ha)	47 (78.3)	34 (60.7)	81 (69.8)
Large (>2 ha)	1 (1.7)	1 (1.8)	2 (1.7)
Average landholding (ha)	0.87	0.73	0.8
Overall	60 (100)	56 (100)	116 (100)

Figures in parentheses indicate percentage *Adult equivalent is aggregate measure of family size that standardize consumption unit within the household taking account age and sex of household members

development region and 10.9% in case of the eastern region (UBOS, 2002). Since, the district is located adjacent to Kenya and there are opportunity and easy access to the Kenyan labor market, it has possibly attracted male people of these areas, resulting into higher incidence of female-headed households for taking care of farm and family. More than seventy percent of the migrants of the 2 countries are migrated to Kenya. Most of them are engaged in manual work, with very few engaged in clerical work (Mpeirwe and Damulira, 2003).

Sabiny is the most dominating tribal group in both parishes, comprising 60.4% of the total households. Bagishu household (41.7%) follows Sabiny in Nabweya and proportion of Iteso households is only 8.3%. However, in Bufumbo parish the proportion of Bagishu and Iteso households are equal, i.e., 14.3% each. Situation of illiteracy is poor in Bufumbo parish, where >40% household heads are illiterate in contrast to only 13.3% in Nabweya parish. In case of secondary school education (attended) and college education, the proportion is higher in Nabweya. Overall, the highest proportion (33.6%) of the household heads is secondary education, followed by illiterate, literate households with informal and primary education and college education.

Agriculture is the most dominating activity with almost 60% of the household heads. This sharing is

relatively lower in Bufumbo parish. There is higher concentration of small landholding households (37.5%) with insufficient food production in Bufumbo parish that has resulted into higher proportion (19.7%) of household heads involved in laborer to meet the basic needs of their households. This is also an area for relatively lower proportion of household heads engaged in agriculture. Involvement of individuals in salaried job is related to the attainment of secondary and college education. Therefore, higher proportion of household heads in Nabweya (30%) is involved in salaried job compared to Bufumbo parish (14.3%).

Fifty percent of the households come under the medium family sized class having > 5-10 members followed by small (37.1%) and large (12.9%) family sized household. Average family size is higher in Nabweya compared to Bufumbo parish, with the overall average of 6.0 adult equivalents. In case of landholding also, household with medium size holding constitutes around 70% of the household, the highest proportion. Only around 2% of households fall under the large holding category having >2 ha and rest, around 28% fall under small holding category with holding <0.5 ha. A proportion of small holding household. In Bufumbo is almost double compared to that of Nabweya parish.

Source of income: Agriculture is accommodating the highest proportion of economically active population. It constitutes 70% of total economically active population. Involvement of almost 92% of economically active female in agriculture reflects the feminine nature of agriculture (Table 2). On the other hand, involvement of male in salaried job, business, laboring and migration (remittance) is high in comparison to female. Higher proportion of Bagishu and Sabiny are engaged in agricultural activity, salaried job and business. The proportion is low in case of Iteso due to low level of endowment mainly land and education. Therefore, laboring and remittance are the sectors, where involvement of Iteso is high. Distribution of occupation based on family size category does not differ remarkably, except for the remittance from which around 12% of economically active population from large family size category is deriving income.

Some 91% of illiterate economically active populations, are engaged in agriculture. This figure goes on decreasing as it relates to literate, school education and college education. Only 34.1% of individuals attained college education is engaged in agriculture. Most of them (43.2%) are involved in salaried job and 15.9% have derived income from remittance. Regarding landholding category, the highest proportion of individuals of large landholding category is involved in agriculture, followed

Table 2: Relationship of occupation with various socioeconomic variables

Variables	Occupation					Total	Emp. rate*
	Agric.	Sal. job	Busi.	Labo.	Remit.		
Gender							
Male	99 (48.8)	48 (23.6)	16 (7.9)	17 (8.4)	23 (11.3)	203 (100)	75.2
Female	183 (91.5)	11 (5.5)	1 (0.5)	2 (1.0)	3 (1.5)	200 (100)	80.0
Ethnicity							
Bagishu	80 (69.6)	23 (20.0)	6 (5.2)	3 (2.6)	3 (2.6)	115 (100)	69.7
Sabiny	177 (72.0)	35 (14.2)	10 (4.1)	7 (2.8)	17 (6.9)	246 (100)	82.0
Iteso	25 (59.5)	1 (2.4)	1 (2.4)	9 (21.4)	6 (14.3)	42 (100)	76.4
Family size category							
Small	70 (70.0)	15 (15.0)	5 (5.0)	5 (5.0)	5 (5.0)	100 (100)	75.8
Medium	160 (70.8)	34 (15.1)	8 (3.5)	12 (5.3)	12 (5.3)	226 (100)	79.6
Large	52 (67.5)	10 (13.0)	4 (5.2)	2 (2.6)	9 (11.7)	77 (100)	74.0
Education category							
Illiterate	151 (91.0)	-	2 (1.2)	9 (5.4)	4 (2.4)	166 (100)	94.9
Literate	59 (76.6)	1 (1.3)	4 (5.2)	10 (13.0)	3 (3.9)	77 (100)	100.0
School education	42 (58.3)	20 (27.8)	5 (6.9)	-	5 (6.9)	72 (100)	60.0
College education	30 (34.1)	38 (43.2)	6 (6.8)	-	14 (15.9)	88 (100)	59.5
Landholding category							
Small	69 (69.0)	10 (10.0)	6 (6.0)	9 (9.0)	6 (6.0)	100 (100)	82.6
Medium	207 (69.9)	48 (16.2)	11 (3.7)	10 (3.4)	20 (6.8)	296 (100)	76.7
Large	6 (85.7)	1 (14.3)	-	-	-	7 (100)	53.8
Total	282 (70.0)	59 (14.6)	17 (4.2)	19 (4.7)	26 (6.5)	403 (100)	77.5

Figures in parentheses indicate percentage, NB: Agric = Agriculture; Sal job = Salaried job; Busi = Business; Labo = Laboring; Remit = Remittance; Emp rate = employment rate (economically active population/economically active age group of 15-64)

by salaried job. Among the small holders, salaried job, laborer and business and remittance, respectively follow the agriculture.

Pattern of involvement in agriculture and business is almost similar in Nabweya and Bufumbo parish. However, proportion of individuals involved in salaried job is higher in Nabweya parish due to its relative access to school, transportation and communication, which also facilitates them to choose salaried job as income source. On the other hand, proportion of individual migrated to remit money back home and laborer is higher in Bufumbo parish. The most accessible destination for these migrants is urban areas of Kenya, to involve in menial job, such as guardsmen, bearers, cooks and servant besides laboring, with few exceptions being involved in clerical work, such as accountant. Overall employment rate is 77.5%. The employment rate is slightly higher in Nabweya parish, which is mainly due to relatively higher availability of employment opportunity, especially higher demand for labor and easy access to transportation and communication that ease the access to salaried job.

The employment rate is higher for female individuals. It is mainly, due to the higher proportion of female individuals involved in agriculture. However, agriculture in these areas is subsistence in nature with very low degree of commercialization, which also means that agriculture is highly seasonal in nature. Thus, nearly all the individuals, who are involved in agriculture are the sufferer of underemployment. In addition, control over the income from agriculture is often restricted to male

individual of household. Therefore, higher employment rate of female does not mean their higher economic strength.

Employment rate is lower in the case of Bagishu compared to Sabiny and Iteso. This is mainly due to the reluctance to involve in menial work and undertake poultry farming and swine raising, both within and outside the village due to their perceived higher tribe hierarchy in the society, in addition to being better endowed with land. Besides, higher education attainment among the Bagishu even resulted into their low interest in crop farming, bovine raising and laborer, rather are engaged in searching salaried jobs. A higher endowment/ asset holding make it feasible for them, mostly educated youth to sustain even without involving in income generating activities like agriculture and laborer. Similar type of negative association between attainment of higher education and involvement in agriculture and laborer has also been reported in De Connick (1994).

Income from different sources: Salaried job provides the highest average income followed by remittance, business and agriculture and laborer (Table 3). Average income from salaried job, business and laborer is not varied remarkably between 2 locations. However, average income from agriculture in Nabweya is twice as high as that in Bufumbo parish. The higher production of grains surplus attributed to the higher yield in Nabweya has helped to derive higher income from agriculture in

Table 3: Average income from different sources

Parish	Source of income	Agric.	Sal. job	Busi.	Labo.	Remit.	Total
Bufumbo	Average income	7627	37133	21833	9829	45181	14315
	Standard deviation	12121	23149	7934	5418	31126	44493
	Frequency	128	18	6	14	15	181
	Min	618	12000	12000	4000	1800	4523
	Max	60000	81600	48000	24000	180000	277200
Nabweya	Average income	14840	36956	18909	9600	23000	19412
	Standard deviation	37703	34095	15657	3374	12245	50961
	Frequency	154	41	11		11	222
	Min	4060	10000	6000	5000	4800	4060
	Max	220760	144000	114000	21000	57600	260760
Overall	Average income	11566	37010	19941	9768	33240	17123
	Frequency	282	59	17	19	28	403
	Min	-	-	6000	4000	1800	4060
	Max	-	-	114000	24000	180000	277200

Agric = Agriculture; Sal job = Salaried job; Busi = Business ; Labo = Laboring; Remit = Remittance

Table 4: Distribution of various socio-economic characteristics and income quartile

Variables	Quartile				Total
	1st (Richest)	2nd	3rd	4th (poorest)	
Gender					
Male	27 (27.6)	5 (25.5)	24 (24.5)	22 (22.4)	98 (100)
Female	2 (11.1)	4 (22.2)	5 (27.8)	7 (38.9)	18 (100)
Tribal ethnicity					
Bagishu	9 (27.3)	8 (24.2)	7 (21.2)	9 (27.3)	33 (100)
Sabiny	18 (25.7)	20 (28.6)	15 (21.4)	17 (24.3)	70 (100)
Iteso	2 (15.4)	1 (7.7)	7 (53.8)	3 (23.1)	13 (100)
Family size category					
Small	14 (32.6)	11 (25.6)	9 (20.9)	9 (20.9)	43 (100)
Medium	13 (22.4)	17 (29.3)	11 (19.0)	17 (29.3)	58 (100)
Large	2 (13.3)	1 (6.7)	9 (60.0)	3 (20.0)	15 (100)
Education category					
Illiterate	4 (12.9)	4 (12.9)	10 (32.3)	13 (41.9)	31 (100)
Literate	4 (13.3)	10 (33.4)	7 (23.3)	9 (30.0)	30 (100)
School	14 (35.9)	10 (25.6)	9 (23.1)	6 (15.4)	39 (100)
College	7 (43.8)	5 (31.2)	3 (18.8)	1 (6.2)	16 (100)
Occupation of head					
Agriculture	11 (16.0)	16 (23.2)	19 (27.5)	23 (33.3)	69 (100)
Salaried job	15 (57.7)	8 (30.8)	3 (11.5)	-	26 (100)
Business	3 (42.9)	3 (42.9)	1 (14.2)	-	7 (100)
Laboring	-	2 (14.4)	6 (42.8)	6 (42.8)	14 (100)
Land holding category					
Small	8 (24.2)	7 (21.2)	8 (24.2)	10 (30.4)	33 (100)
Medium	21 (25.9)	20 (24.7)	21 (25.9)	19 (23.5)	81 (100)
Large	-	2 (100)	-	-	2 (100)

Figures in parentheses indicate percentage

Nabweya. Availability of surface water irrigation accompanied by relatively higher use of fertilizers and pesticide has resulted into higher crop yield in Nabweya (Mpeirwe and Damulilra, 2003). On the other hand, average income received, as remittance in Bufumbo is twice as high as that of Nabweya parish.

There is lacking of a well-defined working hour, particularly for the agricultural and daily wage laborer. In most cases, the laborers are paid in kinds. All these arrangements of labor market in rural areas are often viewed as the exploitation of the laborer class (Nuwagaba, 2000). This is the reason why average income earned from laborer is the lowest. Low level of their resource endowments, i.e., education, landholding and capital often

hinders such individuals to access other income generating activities (Mpeirwe and Damulilra, 2003). Besides, these laborers are also characterized by low productivity (IF, 2003). Therefore, households with the laboring as the main source of income constitute the higher proportion of poor (Table 4) and food insecure households. These facts necessitate the reform in labor market together with its strict enforcement in order to achieve national goal of poverty reduction (IF, 2003).

Distribution of socioeconomic variables of households by income quartiles: The distribution of household by socioeconomic characteristics shows that the highest proportion of female-headed household (almost 39%) is

Table 5: Share of the different income sources by income quartile

Parish	Income quartile	Source of income					Total
		Agric.	Sal. job	Busi.	Labo.	Remit.	
Bufumbo	1st (Richest)	3319 (21.5)	6349 (41.2)	1032 (6.7)	-	4732 (30.6)	15432 (100)
	2nd	3575 (46.6)	1006 (13.1)	940 (12.2)	651 (8.5)	1503 (19.6)	7675 (100)
	3rd	3230 (74.9)	369 (8.6)	0	684 (15.9)	30 (0.7)	4313 (100)
	4th (Poorest)	1550 (85.3)	-	-	267 (14.7)	-	1817 (100)
	Overall	2919 (39.9)	1931 (26.4)	475 (6.5)	418 (5.7)	1566 (21.4)	7309 (100)
Nabweya	1st (Richest)	10351 (51.6)	8834 (44.0)	552 (2.7)	-	333 (1.7)	20070 (100)
	2nd	6702 (54.1)	4248 (34.3)	229 (1.9)	-	1200 (9.7)	12379 (100)
	3rd	3524 (54.2)	1479 (22.8)	422 (6.5)	333 (5.1)	738 (11.4)	6496 (100)
	4th (Poorest)	2083 (81.8)	200 (7.8)	107 (4.2)	130(5.1)	27(1.1)	2547 (100)
	Overall	5665 (54.6)	3690 (35.6)	328 (3.2)	116 (1.1)	574 (5.5)	10373 (100)
Overall	1st (Richest)	8102 (44.4)	7983 (43.7)	784 (4.3)	-	1379 (7.6)	18249 (100)
	2nd	4057 (40.3)	2604 (25.9)	584 (5.8)	388 (3.9)	2424 (24.1)	10057 (100)
	3rd	3603 (67.8)	776 (14.6)	224 (4.2)	306 (5.8)	403 (7.6)	5313 (100)
	4th (Poorest)	1595 (81.4)	-0	38 (1.9)	319(16.3)	7 (0.4)	1959 (100)
	Overall	4339 (48.8)	2841 (31.9)	399 (4.5)	262 (2.9)	1053 (11.9)	8894 (100)

Figures in parentheses indicate percentage, Note: Agric = Agriculture; Sal job = Salaried job; Busi = Business Labo = Laboring; Remit = Remittance

Table 6: Correlation coefficient between total income and income sources

Income sources	Bufumbo		Nabweya		Overall	
	Correlation coefficient	p-value	Correlation coefficient	p-value	Correlation coefficient	p-value
Agriculture	0.23	0.8	0.7	0.00**	0.58	0.00**
Salaried job	0.68	0.00**	0.63	0.00**	0.66	0.00**
Business	0.66	0.12	0.18	0.15	0.19	0.14
Laboring	-0.18	0.17	-0.12	0.92	-0.14	-0.11
Remittance	0.81	0.00**	0.03	0.78	0.42	0.00**

fallen under the fourth quartile (Table 4). Similarly, the highest proportion of households with illiterate household head, household head engaged in laboring and small landholding falls under the fourth quartile of household, i.e., the poorest household. Almost 77% of Iteso household falls under third and fourth quartile with the average per capita income less than the poverty line defined by UBOS (2002). Distribution of socioeconomic variables of households by income quartile for both parishes shows more or less similar pattern.

Share of income from different sources: Per capita income of the households shows that the share of agricultural income has increased from the first quartile (richest) to the fourth quartile (poorest). The pattern is similar for both locations (Table 5). However, the share of agriculture for the first quartile in Bufumbo is less, i.e., 21.5% compared to 51.6% in Nabweya parish. Higher share of income from remittance in case of Bufumbo, i.e., 30.6% compared to 1.7% in Nabweya, for the households under the first quartile results into low share of agricultural income.

Share of income from salaried job, on the other hand, declines from the household under first income quartile to the household under fourth income quartile in both locations. Share of business income shows some mixed results. In case of Bufumbo, the share is the highest for the households under second income quartile, where as

in Nabweya parish, the share is the highest for household under third income quartile. Overall, share of income from business as well as remittance is the highest for household under second income quartile.

If we consider the poverty line for rural eastern highlands (USD\$1 = Uganda Shillings 2,000) set by UBOS (2002), to calculate absolute poverty, around 60% of total households are under poverty line. The incidence of poverty is almost 50% in Nabweya and 72% in Bufumbo parish. This signifies that poverty is more prominent in relatively remote rural areas.

Relationship between income source and total income: Correlation between different sources of income and total income shows that salaried job and remittance in case of Bufumbo and agriculture and salaried job in case of Nabweya parish are important sources of income, contributing significantly to total income (Table 6). Overall, these three sources of income are positively significantly correlated with total income. Income from laboring has a mutually exclusive relationship with other sources of income. Once an individual is engaged in laboring that has also the lowest average income, s/he is not being able to derive income from other sources like salaried job, business and agriculture. In contrast to this, individuals involved in agriculture or salaried job or business have also derived income from other sources as well. This has led to negative association of labor income

Table 7: Relative concentration coefficients of different income sources in overall income inequality

Parish	Source of income	Agric.	Sal.job	Busi.	Labo.	Remitt.
Bufumbo	From coefficient of variation (C_i)	0.19	1.86	1.28	-0.39	1.72
	From Gini coefficient (g_i)	0.34	1.67	1.32	-0.21	1.63
Nabweya	From coefficient of variation (C_i)	0.89	1.39	0.40	-0.22	0.15
	From Gini coefficient (g_i)	0.88	1.36	0.58	-0.07	0.29
Overall	From coefficient of variation (C_i)	0.76	1.56	0.74	-0.49	1.02
	From Gini coefficient (g_i)	0.75	1.49	0.94	-0.35	1.08

Table 8: Weights of different income sources in overall income inequality

Parish	Source of income	Agric.	Sal. job	Busi.	Labo.	Remitt.	Total
Bufumbo	Factor inequality based on coefficient of variation ($W_i C_i$)	0.080	0.490	0.080	-0.020	0.370	1.0
	Factor inequality based on Gini coefficient ($W_i g_i$)	0.140	0.440	0.080	-0.010	0.350	1.0
Nabweya	Factor inequality based on coefficient of variation ($W_i C_i$)	0.489	0.493	0.013	-0.003	0.008	1.0
	Factor inequality based on Gini coefficient ($W_i g_i$)	0.480	0.481	0.020	-0.001	0.020	1.0
Overall	Factor inequality based on coefficient of variation ($W_i C_i$)	0.370	0.500	0.030	-0.010	0.110	1.0
	Factor inequality based on Gini coefficient ($W_i g_i$)	0.360	0.480	0.040	-0.010	0.130	1.0

with total income. Income from business has a positive contribution to total income but statistically it is non-significant.

Income inequality decomposition analysis: Inequality measured in terms of Gini coefficient is lower in Nabweya (0.38) compared to Bufumbo (0.45). This means that the income inequality is higher in a relatively remote area than accessible rural areas. Overall, Gini coefficient for both the villages is 0.4, which is higher compared to the Gini coefficient calculated for the rural Uganda as a whole, which is 0.35 (UBOS, 2002).

The results of income inequality decomposition based on both coefficient of variation and Gini coefficient have given the similar result. In Bufumbo parish, both these measures show that salaried job, remittance and business have relative concentration coefficient value >1 , i.e., 1.86, 1.72 and 1.28, respectively based on coefficient of variation and 1.67, 1.63 and 1.32, respectively based on Gini coefficient (Table 7). This reflects the income disequalizing effect of these income sources, i.e., distribution of income from the source in the same manner as the original units leads to an increase in overall income inequality. In case of Nabweya parish, only salaried job is found to have income disequalizing effect. Negative value in case of laboring for both locations reflects the income equalizing effect of labor income, i.e., income distribution from other sources has remained the same as of labor income, leading to a decrease in overall income inequality. Overall, both salaried job and remittance have relative concentration coefficient value greater than 1, revealing its income disequalizing effect. Laboring, agriculture and business, respectively have the highest income equalizing effect. Hence, it signifies that labor-intensive agriculture promotion activities could be a better option to deal with the problem of rural poverty. Marketing of the agricultural inputs and outputs is crucial together with regulation of minimum daily wage and well-defined working hours.

Weights of different income source in total income inequality obtained from both coefficient of variation and Gini coefficient show the similar pattern. A contribution of salaried job to the total income inequality is the highest. It is around 0.5 in both Bufumbo and Nabweya parish, which signifies that the contribution of income from salaried job in total income inequality is 50% (Table 8). Besides, remittance is also contributing significantly to the total income inequality in Bufumbo with a contribution of around 36%. Agriculture and business are contributing more or less the same proportion to the total income inequality, which is around 10%. In Nabweya, however, contribution of agriculture to total income inequality is second to the contribution by salaried job. The contribution of agriculture in total income inequality is around 48%. Here, contribution of income from business and remittance to total income inequality is more or less the same, i.e., around 1% based on the coefficient of variation and 2% based on Gini-coefficient. Laboring, on other hand, for both locations is found to have negative contribution to the total income inequality though the value is meager. Overall, income from salaried job, agriculture and remittance is contributing around 49, 36 and 12%, respectively to the total income inequality.

CONCLUSION

This study reveals that very limited availability of economic opportunities in the study area and easy access of the people to the Kenyan labor market have resulted into the higher incidence of female-headed households taking care of farm and families. Sabiny is the most dominating caste group comprising more than half of the residents followed by Bagishu and Occupational caste. Illiteracy is high in Bufumbo parish. With the better attainment of education, involvement of household in salaried job in Nabweya parish is high. In contrast to this, involvement in laboring is higher in Bufumbo parish due

to significantly low educational attainment. In both cases, proportion of household's involvement in agriculture is the highest. However, due to higher concentration of small holding households together with subsistence nature of agriculture in ty1elauli, the people there are not able to derive sufficient income from agriculture. Lack of basic infrastructure like communication and transportation is hindering the commercialization of agriculture in Bufumbo parish.

Involvement of economically active population in agriculture is also the highest, which also means the share of agriculture in the employment is the highest. However, agriculture in the study area, especially in Bufumbo parish is predominantly seasonal in nature that has resulted in the problem of underemployment, thereby low average income. The situation coupled with the higher involvement of female and illiterate individuals in agriculture has resulted into the higher concentration of female and illiterate headed household in the fourth income quartile. Higher proportion of Iteso falls under the fourth income quartile, mainly due to their involvement in laboring that derives the lowest average income. Proportion of Bagishu and Sabiny involved in salaried job as well as remit money from foreign employment is higher and their average income is the highest. Higher attainment of education of these tribe groups signifies their involvement in such activities. This has resulted into the low proportion of households from these tribes to fall under fourth income quartile. Share of agricultural income in total income is higher which is mainly due to the significantly high proportion of individual as well as household head involved in agriculture. A remarkably high share of agricultural income in total income in Nabweya shows the prospects of agriculture in the areas with an easy access to market by means of transport and communication. In Bufumbo parish, contribution of money remitted by migrant workers is higher. Network of local communities is helping to ease to access to such foreign labor market especially Kenya.

Income from salaried job and remittance, which is also significantly correlated with total income, has the income disequalizing effect in Bufumbo parish. This is mainly due to the restricted access to such income activities, which is also deriving the highest average income. This has also resulted into the higher weight of salaried income and remittance in overall income inequality in Bufumbo parish. In Nabweya parish, agriculture and salaried job having significant correlation with the total income, also has higher weight in total income inequality. Overall, salaried job has the highest weight in total income inequality followed by agricultural income and remittance. On the

other hand, with the negative correlation with the total income, labor income has income equalizing effect.

Very few individuals/households are involved in higher income generating activities like salaried job, remittance, business and commercialized agriculture. This is mainly due to the strict restriction to individuals, who are deprived in assets like land, education and capital for investment together with gender biasness in such income generating activities. Thus, income from these sources has negative impact on overall income distribution. At the same time, it is also not possible to improve access to such income generating activities to huge mass within the short span of time. Thus, it requires the long term planning to deal with the accessibility of rural population to relatively higher income generating opportunities. However, for planning strategy, agricultural improvement, on which 70% of labor forces are dependent, in rural areas coupled with proper market facility will be helpful to reduce the income inequality vis-a-vis poverty reduction. In addition, regulation regarding working hour and minimum wage rate should be strictly implemented for the welfare of those involved in laboring, which also belongs to the poorest group. The findings of this study would have important implications for policy formulation and further research to deal with the crucial issues of rural poverty and income disparity in Uganda.

REFERENCES

- Adams, R.H. and J.J. He, 1995. Sources of income inequality and poverty in rural Pakistan. Research Report 102. Washington, D.C.: International Food Policy Research Institute.
- Boardman, A.E., D.H. Greenberg, V.R. Vining and D.L. Weimer, 2001. Cost Benefit Analysis: Concepts and Practice. Prentice Hall, Inc., Upper Saddle River. 2nd Edn. New Jersey 07458, pp: 526.
- Brent, R.J., 1998. Cost-benefit analysis for developing countries. Edward Elgar Publishing Limited, Cheltenham. UK and Northampton, MA, USA.
- Cornia, A.G., 2004. Inequality, Growth and Poverty in an Era of Liberalization and Globalization (Ed.). Oxford: Oxford University Press for UNU WIDER.
- De Connick, J., 1994. Evaluating the impact of NGO's in rural poverty alleviation: Uganda country study, ODI working paper 51, London.
- IF, 2003. Uganda: Trade and Competitiveness Study. Integrated Framework of Trade Related Technical Assistance to Least Developed Countries. New York: United Nations.
- Kakwani, N.C., 1977. Applications of lorenz curves in economic analysis. *Econometrica*, 45 (3): 719-728.

- MFPED, 2002. Uganda Participatory Poverty Assessment Report: Deepening the Understanding of Poverty, Kampala: UPPAP, pp: 22.
- Mpeirwe, A. and D. Damulira, 2003. Rethinking the National Food security policy in Uganda, Policy Research Paper No. 1: ACODE, Environmental Alert and VEDCO. Kampala, Uganda.
- Nuwagaba, A., 2000. Macro-Economic Policy Reforms on the Social Sector in Africa. Makerere Institute of Social Research.
- Shanmugaratnam, N., 2001. On the Meaning of Development-An exploration of the capability approach, *Forum for Dev. Studies*, 28 (2): 263-288.
- Shorrocks, A.F., 1982. Inequality Decomposition by Factor Components. *Econometrica*, 50 (1): 193-212.
- Thorbecke, E., 2004. Conceptual and Measurement Issues in Poverty Analysis. WIDER Discussion Paper DP2004/04. Helsinki: UNU-WIDER.
- UBOS (Uganda Bureau of Statistics), 2002. Provisional Population Census Results. Entebbe, Uganda.
- UNDP, 2004. Uganda Human Development Report 2004. Empowerment and Poverty Reduction. Kampala: United Nations Development Program.
- UNDP, 2005. Millennium Development Goals (MDGs) Progress Report, 2005. Kampala: United Nations Development Program.
- Wan, G.H., 2001. Changes in Regional Inequality in Rural China: Decomposing the Gini Index by Income Sources. *Aus. J. Agric. Res. Econ.*, 45 (3): 361.