

Full Length Research Paper

Livelihoods diversifications and implications on food security and poverty levels in the Maasai plains: The case of Simanjiro district, Northern Tanzania

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This paper presents findings of a study that examined livelihood strategies that have evolved in the pastoral area and whether these strategies help the people in alleviating their poverty while ensuring food security. Participatory rural appraisal and wealth ranking exercise were used for data collection, while descriptive statistics was used for the data analysis. The findings show three wealth categories in the three villages studied; the Arkasisi/Altajiri; Menati/Dorpu and Oltoroboni/Lepai; as the rich (high class people), moderately rich (middle class people) and the poor (low class people) respectively. The wealth groups are dynamic as they try to maintain their status and or increase it, while those at the lower categories make deliberate attempts to join the wealthier on the wealth spectrum. The pastoralists strategically diversify their livelihoods through engaging in agriculture, charcoal selling, retail shops and restaurants and trading in minerals. However, resources accrued from these activities are re-invested in livestock. The study suggests that poverty alleviation efforts should target the people as perceived by the people themselves.

Key words: Semi-arid, pastoralism, agriculture, ecosystem change, Maasai Plains.

INTRODUCTION

Pastoralism is the dominant life form and production system in semi - arid parts of Tanzania. In these areas, livestock production contributes to the sustainable livelihoods and security of the rural poor in many ways. It provides for natural capital (meat, milk, hide, rangeland, and pasture), source of financial capital (cash, saving, credit, insurance, gifts, and remittance) and social capital (traditions, wealth, prestige, identity, respect, friendship, marriage dowry, festivity). In Tanzania pastoral tribes such as the Maasai, Nyaturu, and Barbaig have for decades through transhumance been able to sustainably use their pastures. However, at that time, seasonal livestock migration was possible because land was abundant and population levels of humans and bovines were low (Raikes, 1981). The management of livestock within mobile systems is a response to ecological realities

of drylands. Rainfall patterns determine when and where to graze because rainfall determines when and where there is abundant pasture (Rugumamu, 1989).

In recent decades, pastoralism in Tanzania, particularly in Northeastern and Central parts of the country like elsewhere in Sub Saharan Africa has been facing severe ecological stress. The stress stemming from prolonged recurrence of droughts and anthropogenic activities such as expansion of smallholder crop cultivation, creation of protected areas such as game reserves and opening up of large - scale farms. These processes have tendencies to deny pastoralists of access to land, previously perceived by local pastoralists as traditional grazing lands (Ahmed 1987; Salih, 1987). Although statistical data indicating increased poverty in the area does not exist in 1994 it was reported that over 50% of the pastoralists in the study area were chronically poor unable to afford 2000 calories a day for their family members. Five years later it was estimated that 60% of pastoralists in Simanjiro had insufficient number of cattle to meet their household needs Erickson (1999). Using this anecdotal

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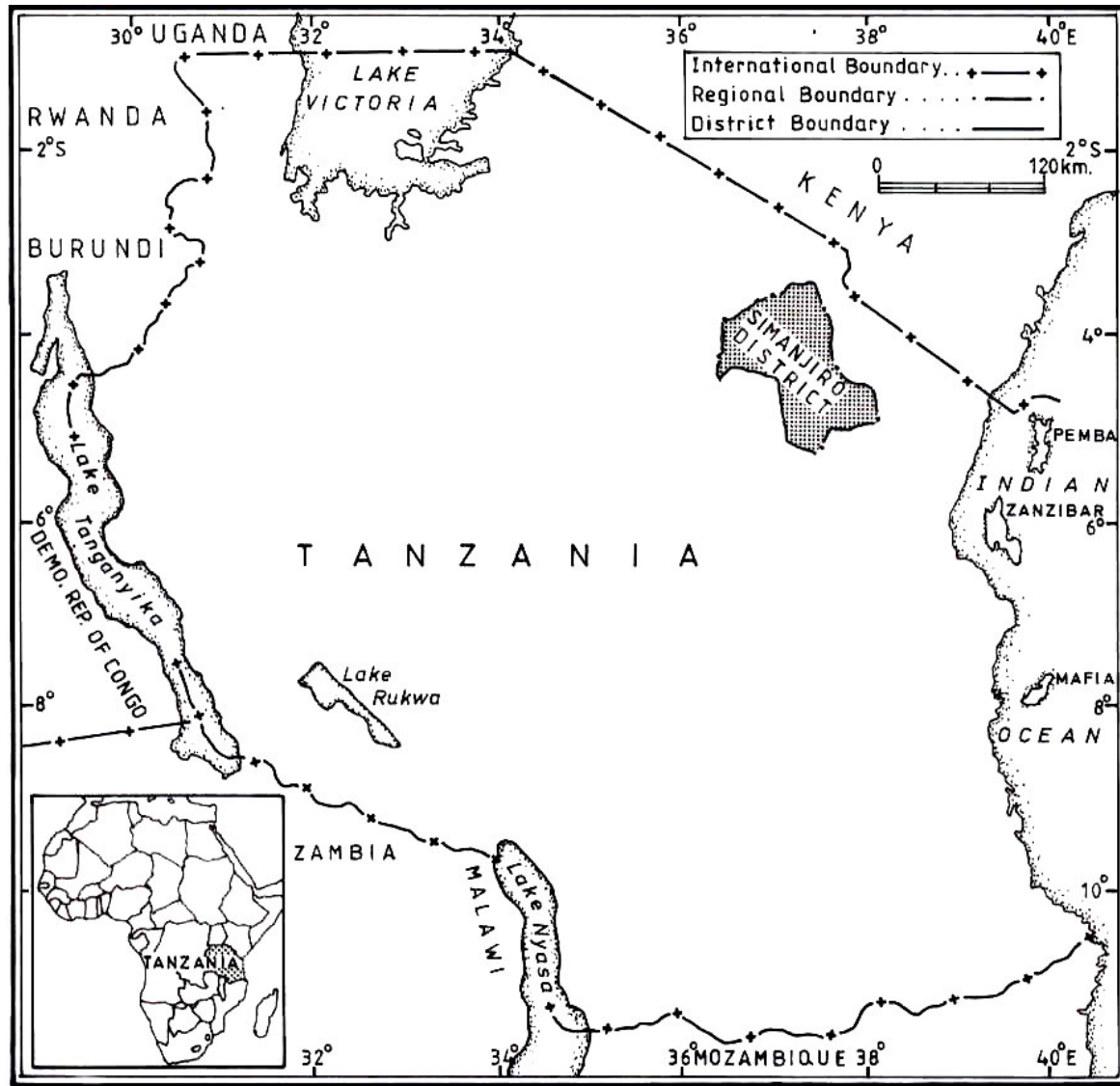


Figure 1. Location of the study area.

data it is likely that the pastoralists in the study area have become poorer than before. These changes in land use were accompanied with a change in tenure rights from communal to private, thus intervening trans-human pastoral movements. Faced with these problems, pastoralists have lost their ability to maintain their mobile livestock economies sustainably, which has given rise to pastoralists to change their livelihood strategies (Potkanski, 1994; Barbier, 1999). Due to these changes, some have turned agro - pastoralists, others live on off farm - livestock activities and the rest particularly youngsters migrate to urban areas to seek for wage employment, while maintaining ties with their homes (Mbonile and Mwamfupe, 1997).

In light of the above situations, which have led to multiplicity of problems and economic forces that confront pastoralists, a better understanding of the way they act,

react and interact with these forces of change and implications on their poverty levels is required (Little et al. 2008). It is therefore, important that the pastoralists' livelihood strategies in response to shrinking resources and increasing competition for the same are documented. This paper presents findings of a study that focused on documenting the emergent livelihood strategies and their implications on poverty levels at household level and the community as a whole. These are central for informing policy.

THE STUDY AREA

This study was conducted in Simanjiro District, Manyara Region of Tanzania (Figure 1). The area entails a diversity of farming systems and land use changes. Three villages of different characteristic were involved in the study. These villages include Kitwai A,

dominated by pastoralism, Landanai with agro-pastoralism and Orkutu in which agriculture is the dominant economic activity.

The district has a land area of 20,591 km² of which 600 km² is fertile land, 12,682 km² is hunting blocks and the rest is hilly area. It is a large and sparsely populated district, divided into 6 administrative divisions with 12 wards and 39 registered villages. According to the 2002 population census, the District has a population of 141,136 out of which 76,351 are males and 64,785 are females (Simanjiro District, 2004). The population of Simanjiro was estimated to be growing at the growth rate of 7.2% in the year 2000. Most of this spectacular growth was due to immigration, thus reflecting fast expansion of mining and agriculture. An approximate 18% of the households have migrated in the district during the last five years. Simanjiro District is largely semi - arid with bimodal rainfall ranging from 400 - 600 mm. The short rains are between November and December whereas the long rains are from February to April. In recent years this has not been the case as rainfalls are unreliable resulting to shortage of water. The dominant vegetation is wooded bush land and bush occupied by the Kisongo Maasai pastoralists with large herds of cattle. Except for about 80 large - scale seed bean farms ranging from 40 ha to over 10,000 ha, crop production is insignificant in the district. Soils are not fertile, so farmers are forced to cultivate extensively.

RESEARCH METHODOLOGY

Combinations of methodologies were employed in this study as described in the following sections.

Sampling

Purposeful sampling was employed in the selection of the study villages (Kitwai A, Landanai and Orkutu) based on their accessibility, prevailing land uses, and socio - economic and environmental characteristics. Based on the village registers the sample (n) from each village was obtained through stratification of the population into sub - villages, age and sex. 5 - digit random numbers generated in LIMDEP version 5.1 software was matched with the name in the village register that bore the number. Whenever possible an equal number of males and females were picked from the village registers. The total sample from the three villages (n = 166) was a gross proportionate number of individuals in each stratum from each village. The sample was regarded adequate as it constituted 5% of the total population (N = 3080) (Boyde et al., 1981).

Types and sources of data

Primary data were obtained from rural households in the study area. A structured questionnaire was administered to a random sample of households in the sample villages. The questionnaire was designed to capture biodata, livestock herds and other livelihood systems. Also, the study sought information on major activities aimed at improving households' income and standard of living, wealth indicators used by the Maasai pastoralist community and poverty perception, the evolution of the activities in the Maasai plains and the major current livelihood activities. Likewise, the study sought information on whether resources (food, income) earned sustain the basic household necessities or not. Due to the limited period of time for the study, the Participatory Rural Appraisal (PRA) was used to quickly generate new information through interactive learning, knowledge sharing and assurance of high - level local people's participation in research. This involved relaxed rapport, open dialogue, brainstorming and mutual sharing of knowledge, skills and experiences (Chambers, 1992; McCracken et al., 1988).

Other techniques used include semi - structured interviews and direct observation. Interviews were conducted with respondents. Secondary data were sourced from unpublished, gray and published literature from libraries which were used to supplement primary data. Villagers did wealth - ranking exercises in each of the three villages to determine wealth categories in their villages.

Data analysis

Semi structured interviews and PRA were transcribed into text files before generating similar emerging themes from the text using NVivo software. SPSS 16.0 software was used in coding, recoding and performing descriptive statistics and correlation. In the later, the analysis focused on changes in livelihoods and farming systems; impact of livelihoods on socio-economic activities, cultural risk, standard of living, sustainable management of natural capital and extent to which enhancement of the life - supporting natural resources were achieved.

RESULTS AND DISCUSSION

The discussion of the findings is based on the framework presented in Figure 2. It presents relationships between wealth, environment and livelihood strategies in terms of the linkages between them, implications in the context of the changing livelihoods and sustainability of the natural capital.

Demographic characteristics

Table 1 shows respondents' profile. The large number of male respondents in the sample was due to their availability for interview unlike female who were unavailable during the day because they had to herd calves, goats and sheep or were engaged in other household activities. Majority of the inhabitants in the study villages are Maasai; others are Meru, Chagga, Pare, Rangi, Nyaturu, Hehe, Nyiramba and Sambia who are immigrants from various parts of Tanzania. Figure 3 shows that 70, 80 and 40% of the respondents migrated into Landanai, Orkutu, and Kitwai A respectively. Migration into the villages started as early as 1934, for Landanai, Orkutu in 1958 and 1971 for Kitwai 'A' villages. It however, peaked between early 1980s to late 1990s. Some of these came from other villages within the district, other districts within the region and some outside the region.

Reasons for in - migration include good grazing land free from animal diseases, availability of good arable land for crop cultivation practices, joining relatives/spouse, mining/mineral business opportunity, seeking both agriculture and grazing lands (Figure 4). These are ecological migrants from highly degraded and unproductive areas like Kondoa Hills (formerly highly potential for agricultural production) into Maasai plains for agricultural land (Mung'ong'o, 1995; Christiansson, 1988; Yanda, 1995). There are also influxes of immigrants into the Maasai plains from the slopes of Mount Kilimanjaro

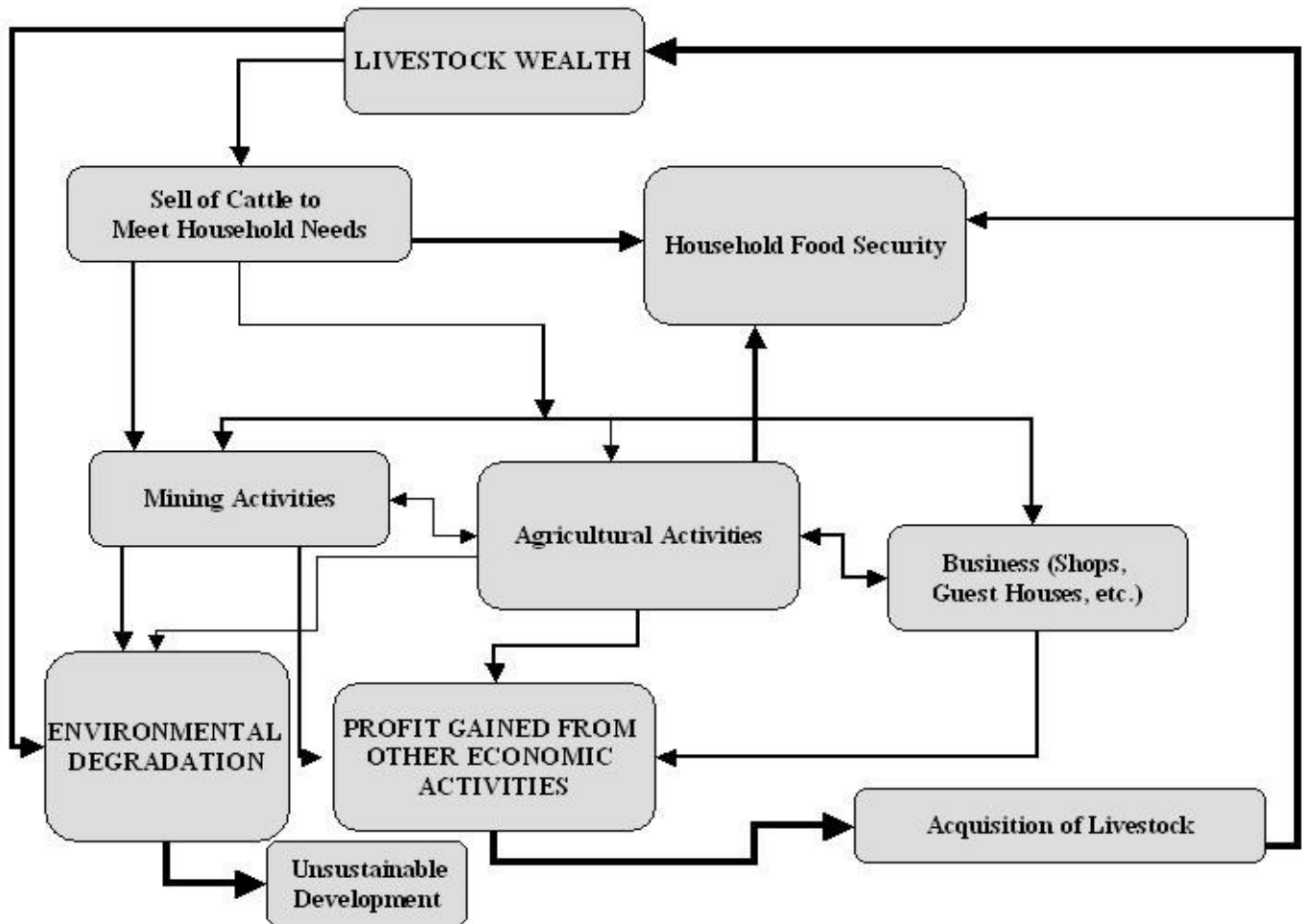


Figure 2. Model Illustrating relationships between wealth, livelihood strategies and environment.

Table 1. Respondents profile.

Respondents characteristics	Number of respondents (N = 166)	Percentage
Sex		
Male	97	58.4
Female	69	41.6
Education level		
Primary education	79	48.5
Secondary education	5	3.1
College/University	3	1.8
No formal education	76	46.6
Occupation		
Agriculture only	87	53.4
Livestock keeping only	50	30.7
Business	9	5.5
Agriculture and Livestock keeping	10	6.1
Mining	5	3.1
Civil servant	1	0.6
Agriculture and business	1	0.6

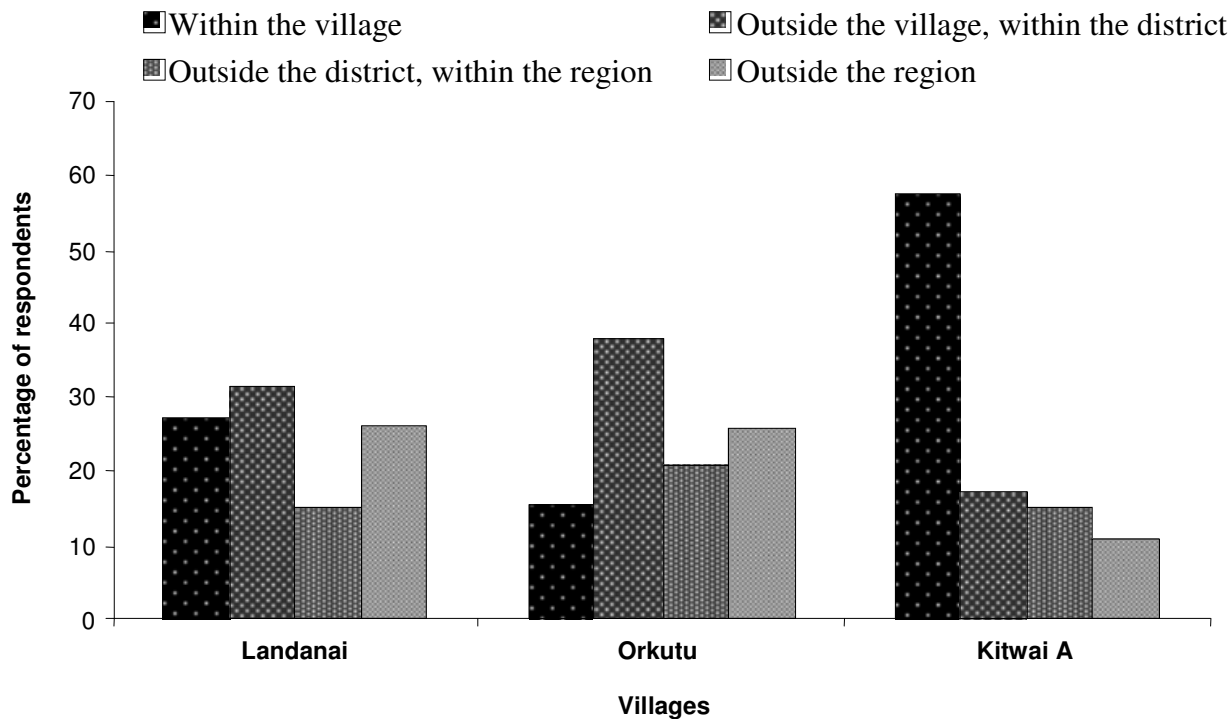


Figure 3. Origin of people residing in the study villages. Source: Survey data, 2004.

(William, 2002) and Meru where land scarcity compels residents on the slopes to seek farmland elsewhere. The study area also experience emigration. A proportion of 22% of the households reported that their family members had immigrated to other areas in search of their fortunes, 66% did not report emigration and the rest constituted non - responses. The dominant migrating age group was between 19-30 (10.2%), other age categories were 7-18 (6%), 31- 45 (5.4%) and 45+ (0.6%). The low level of education and non-formal education of most responds explain emigration in the study area as youths emigrate to seek for manual labour employment elsewhere. Forty six percent of the respondents had no formal education, while 48.5% had primary school education indicating a high illiteracy level. Long distances to schools discourage children to go to school because they have to stay all day long without food. In addition, traditionally the Maasai were reluctant to send their children to school but present day surveys show that this is changing. Pastoralists also aspire to be Kiswahili literate for ease of communication at markets, hospitals, etc. Among them, education is equated with getting more power, with leadership and influence outside the traditional institutions.

Wealth ranking

In Kitwai A, Landanai and Orkutu villages, perception of 'who the poor are' differed. The criteria for classification

of the different wealth groups in the villages were based on cattle numbers, ownership of a farmland, number of wives and children (with emphasis on male children) and household food security. The larger the number of animals a Pastoralist owns, the wealthier compared to others. Also, villagers considered possession of other assets as motor vehicle, motorbike, bicycle and participation in business (minerals and livestock), the level of socio - economic 'independence' and efforts demonstrated by an individual to move from a less favourable wealth category to a more pleasant one. The duration an individual has been involved in cultivation and the freedom of airing views in important traditional gatherings were also taken into account. The number of items possessed by an individual for setting a benchmark for a particular wealth group varied among villages (Table 2). In the wealth ranking exercise the villagers consensually ranked all the households according to different wealth groups. Three wealth categories were identified in the three villages studied; the Arkasisi/Altajiri; Menati/Dorpu and Oltoroboni/Lepai; as the rich (high class people), moderately rich (middle class people) and the poor (low class people) respectively.

Major economic activities

Residents of the study villages have dynamic occupations Figure 5. Livestock keeping (30.7%) and agriculture (53.4%) were the main economic activities.

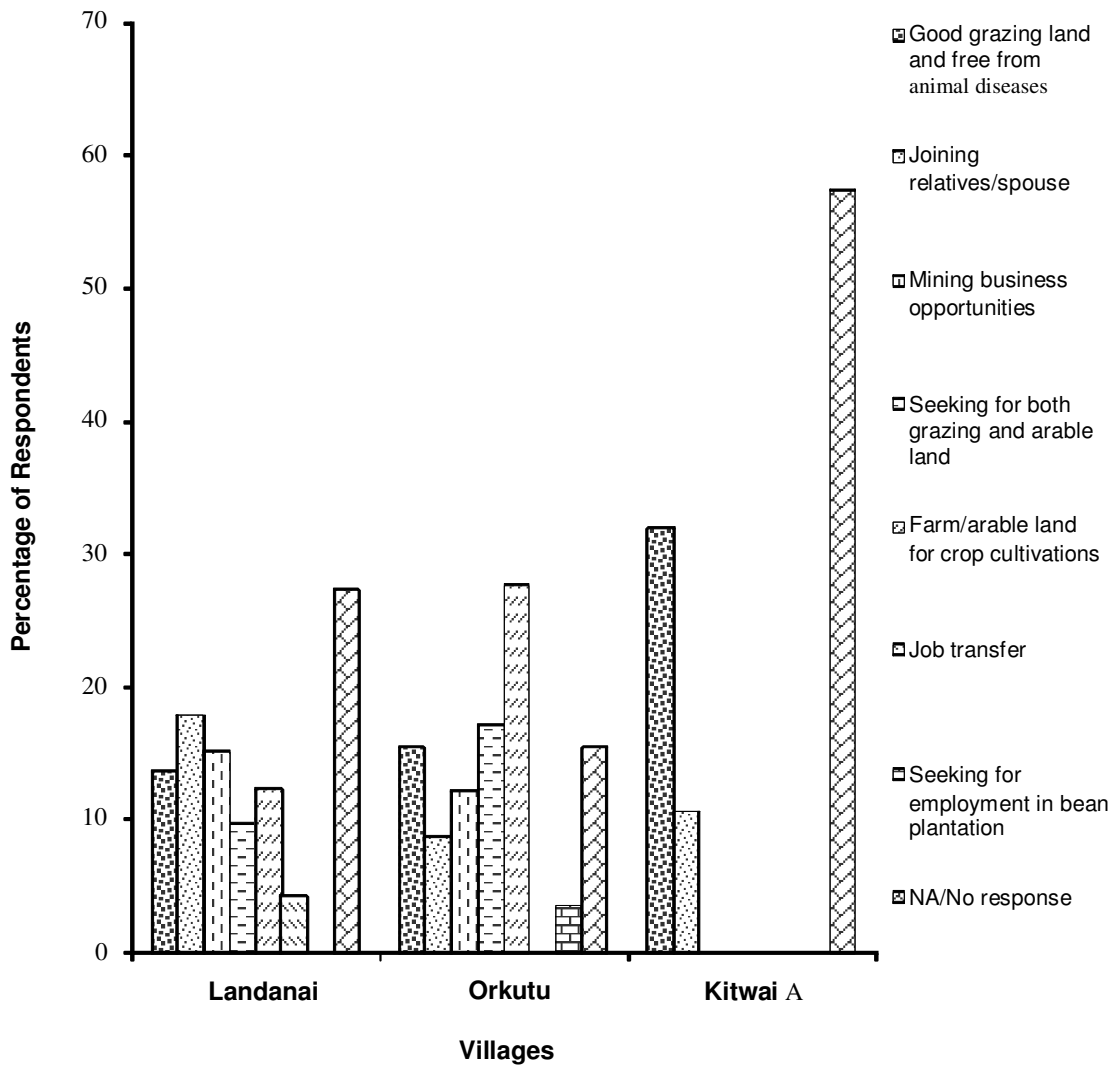


Figure 4. Reasons for migration. Source: Survey data, 2004.

Table 2. Social groups and wealth characteristics.

Wealth groups	Social - economic characteristics
Kitwai A village	
(High class people - rich) Altarijiri (6%)	Own cattle 1000 - 3000, hire labourers, is independent, Farmland 5 - 10 acres, self-sufficient in food security. They have started cultivating in 2000s.
(Middle class people) Dorpu (44%)	Own cattle 1 - 19, farmland 1 - 3 acres, are not seeking assistance, not hiring labourers (self sufficient), and aim to strengthen wealth through struggle such as buying cattle.
(Low class people - poor) Menati (50%)	Is dependant (beggar), has no food, no decent clothes, no money, no cattle, farmland less than 1 acre, is hired for labour in order to get food and cash (cultivation and sending livestock to grazing land)
Orkutu village	
(1 st High class people - rich) Arkasisi (30%)	Has many children 10+, wives 4 – 10, each wife has two donkeys, cattle above 80, goats above 80, farmlands more than 50 acres, businesses such as mining, transport, cattle, own tractor, guest houses, etc.
(2 nd High class people - rich) Altarijiri (15%)	2 wives, children 2 - 8 (with 2 sons), may have many livestock but few children, cattle like <i>Arkasisi</i> , has no freedom of speech if he has less male children.

Table 2. Contd.

(Middle class people) Menati (50%)	Is trying to accumulate wealth-has a chance to be in Arkasisi class, has few cattle <10, one wife, 1 - 2 children, can not be hired for labour, struggle to enter into higher classes.
(Low class people - poor) Oltoroboni (5%)	Has no cattle, no donkey, no wife, no children, dependant, staying in caves, is hired for labour in order to have food, not able rise up into any of the high classes.
Landanai village	
(High class people - rich) Arkasisi (20%)	Own cattle-more than 50, goats-more than 100, sheep-more than 100, donkeys-more than 10, has more than 6 wives, has many children-more than 15, own farmland-more than 15 acres, has about Tsh.3 Millions, hire labourers for raring livestock and doing farm activities, might have a motorbike, car or tractor, participate in business-Minerals, cattle and run shops.
(Middle class people) Menati (70%)	Own cattle 5 - 50, goats 30 - 50, sheep 30 - 50, donkey 1 - 5, has 2 - 3 wives, children 5 - 10, farmland 1 - 10 acres, has about T.Shs. 10,000 - 100,000, hire labourers, has a bicycle, runs business-goats and minerals.
(Low class people - poor) Oltoroboni (10%)	Has one wife, less than 5 cattle, less than 5 children, own no donkey, no farmland, food insecure, has 2 goats/sheep, has many dogs (for hunting), harvest honey, hired for labour. He takes care of other people's cattle (less than 7) - LEPAl, he is a dependant and uncertain with his life.

Source: Survey data, 2004.

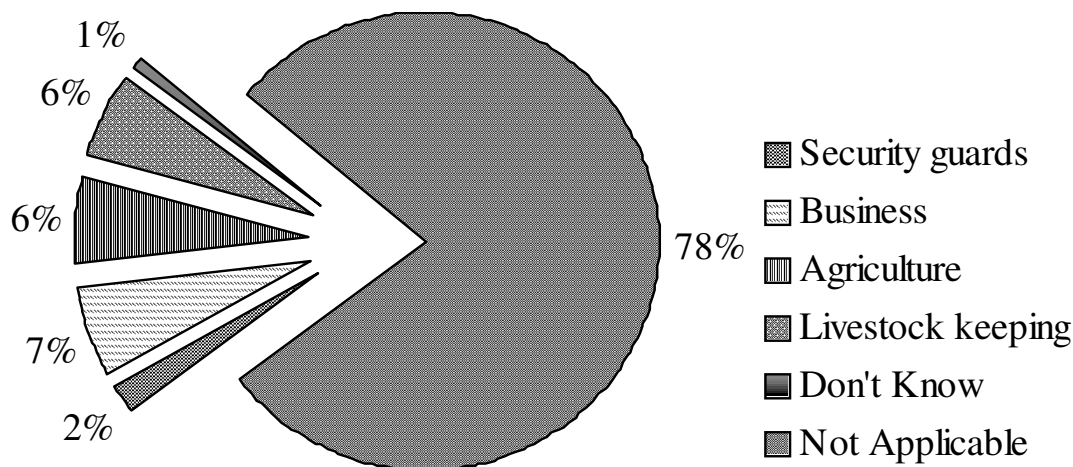


Figure 5. Activities migrants do at the area of destination. Source: Survey data, 2004.

Those who immigrated in the study area performed economic activities they were used to in their areas of origin (Mbonile and Mwamfupe, 1997; Mung'ong'o and Mwamfupe, 2003). To a lesser extent there were other activities such as mining and businesses. Also, Figure 6 shows that peoples' occupations between villages vary. The variation may be a result of different wealth categories present in the pastoral community. Individuals' wealth determined how they responded differently to environmental and economic shocks. Individuals' access to resources, level of use and management of the resources; and capability for diversification of production depended largely on their household assets and production options before them. As such poor families

suffer more from the impact of environmental shocks than wealthier groups (Pillai, 2001).

Livestock keeping (Pastoralism)

Respondents stated that they kept cattle, goats, sheep, donkeys and dogs. Donkeys and dogs were used for carrying luggage and security, respectively. Cattle were valued for wealth, prestige, dowry and business; goats and sheep for households' consumption/food security and generating cash incomes. Sheep were also kept for medical purposes and sheep fat was used in concoctions used for treating mothers' medical complications after

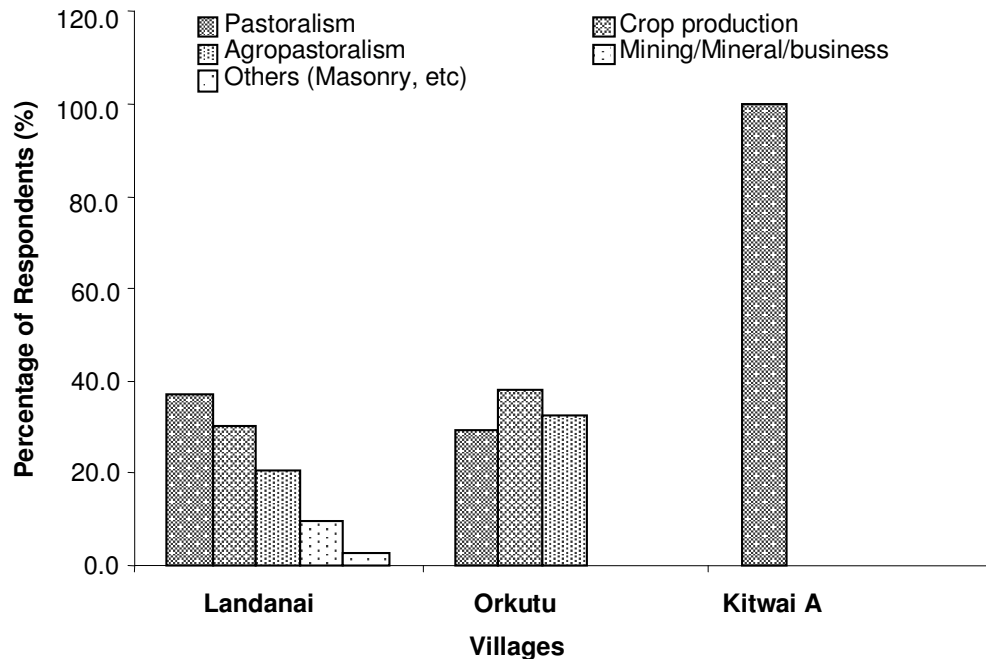


Figure 6. Respondent's main occupation. Source: Survey Data, 2004.

delivery. Women owned small ruminants and donkeys while men owned cattle. This ownership difference influenced decision making on family wealth generation and usage. The head (father) of the household appropriated all wealth generated and little to nothing was allocated to women (mother). This household power asymmetry constrains the contribution of women in poverty alleviation at household level. But if the poor are empowered, household income could be augmented and the environment protected (Pillai, 2001).

PRA results revealed that the number of livestock kept by individual pastoralists varies which in turn defined wealth groups. It was observed that 25% owned five cattle or less, 8% had more than 5 cattle but less than 20, 6% kept more than 20 animals but below 200 and 2% owned 200-800 cattle and above. Some pastoralists such as Altajiri (the rich) kept large animal numbers exceeding 1000 of herds. Large herds serve as a 'life insurance' during the period of drought when the animals die leaving a few cattle. Depending on the age and health of the animal and market prices, the market price of cattle per head ranged between 80,000 - 120,000 T.Shs. while goats and sheep fetched a price of 5,000 and 6,000 T.Shs, respectively. The surviving animals multiply yearly after a given 'good pasture' period of time the herd recuperates. Majority of the respondents reported increase of livestock number over time partly due to natural increase, migrant pastoralism, selling and buying of livestock and income from other economic activities (Figure 7). Alternatively pastoralist communities engaged in agricultural activity as a strategy to increase their

livestock numbers. Some of the earnings from agriculture are used to buy more cattle as a strategy for wealth accumulation. When the herds are huge and difficult for an individual to manage, they divide to either the moderately rich (Menati) people or the poor (Oltoroboni) to take care of them. In return for keeping Altajiri's cattle Menati and Dorpu get milk, and calves as payment for their service. Although in this way the Altajiri sustain their riches it is also some form of wealth sharing because the poor benefits and enables them to positively shift their position on the wealth spectrum, to a relatively better wealth category.

Although cattle was an indicator of wealth, that differentiated the rich from the poor. The challenge was how pastoralism would co - exist with agriculture because there was a lack of "mutual cooperation" in the use of the available land and water resources when inequality exists (Borgerhoff et al., 1999). The wealth categories that exist among pastoralists coupled with the presence of the Waswahili (non - Maasai) may complicate resources use even further.

Crop cultivation (Agriculture)

Crop cultivation (agriculture) evolved in the last two decades (from 1980s) Erickson (1999). As a new activity, settled pastoralists during seasons of reliable rainfall cultivated adequate land areas to feed their families from their own crops. When rainfall is unreliable and the yields are poor the households resort to selling cattle, income

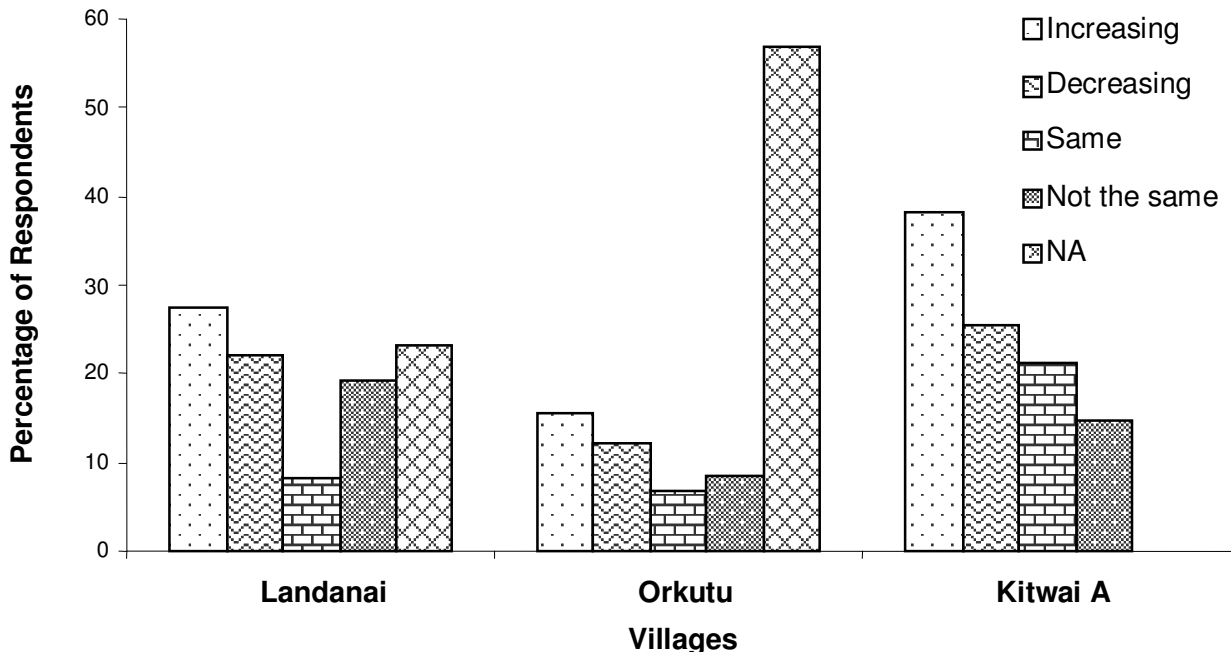


Figure 7. Status of livestock keeping during the past 10 years. Source: Survey data, 2004.

from selling cattle and from other activities supplement food shortage. There were variations in the nature and pace of evolution of agriculture among Kitwai A, Orkutu and Landanai villages. In Kitwai A, for example, crop cultivation started mostly in 2000s, while in Orkutu and Landanai the agriculture practices started in 1980s and 1990s respectively. Orkutu village started crop cultivation earlier than any other village due to the presence of new comers and being close to large-scale farms such as George's company. In Landanai village, agriculture activity was influenced by the presence of farmers from other parts of Tanzania. In Orkutu and Landanai, a pastoralist cultivated a farmland above 30 acres, while in Kitwai A village a pastoralist hardly cultivated 5 acres of farmlands per agricultural season.

For a family of five, families whose harvests were above 22 bags of maize per acre/year (5%), enabled them to have food throughout the year. Those who harvested less than 22 bags of maize (29%) were able to have a six months food supply. Food for 19% of respondents lasted for four months while 39% of the respondents' had a month of food supply. About 11% were not sure how long the food they get from agriculture would sustain them. A Pastoralist who cultivates maize for example has an insurance of 80,000 - 120,000 TShs. per head of cattle, and an additional income of 17,000 - 20,000 T.Shs. per 100 kg bag of maize. This adds up to an estimate of 97,000 - 140,000 T.Shs. per unit of measure, depending on the number of bags produced and the number of cattle owned. This is an attempt to move from poverty, however it varies with the assets an individual household has.

The Land Policy of 1997 guarantees equal access to land between male and female. But issues of land ownership between spouses were influenced by custom and traditions. The Land Act of 1999 affirms equality of women and men over rights of access to land; it also protects women's rights of property control within marriage. Women in the pastoral economy were inferior to men and had no influence over ownership of resources (Thompson and Homewood, 2002). Moreover, the land act stresses the fact that customary land tenure is based on clan ownership, which traditionally discriminates against women! The customary laws in the pastoral communities constrain females to access land such that the role of women in poverty alleviation is doomed to fail. It was also observed that pastoralists had to diversify their economy as a result of impacts of the mid 1980s economic liberalization in Tanzania which resulted in removal of subsidies in all service sectors and extension services. This made the cost of production in such sectors as livestock keeping very high. The pastoralists found themselves unable to fully pay for extension services. Thus livestock rearing became expensive and unaffordable to low income earners (Oltoroboni and Menati/ Dorpu). 52% of the respondents reported they had no access to credit facilities for livestock development. 2.4% of the respondents said had credits from private institutions while others were not aware of credit facility from private firms. From that viewpoint it is clear that the pastoralists may be impoverished further by affecting their capital stock, cattle. It was obvious that pastoralists had to look for alternative livelihoods, and agriculture being one of the options.

Mining

The study villages are situated close to the mineral reserves. Minerals such as Ruby, Rhodolite, Green garnet and Green tourmaline in villages particularly Landanai have attracted immigrants from different parts of the Tanzania who engage themselves in mining activities. They work as miners and/or brokers and participate in such other activities as agriculture, charcoal making and shops. Coloured rocks are also found around the mining pits. Small scale mining using little equipment started as early 1960s and 1970s. Most of the miners were immigrants. In 1980s the trade liberalization policy provided an avenue to the local and foreign companies to participate in the mining industry. These became operational considerably expanding the mining industry at village and district level. Maasai youths (Irkimunya) from the Artajiri families joined the mineral business as middlemen (brokers). This implied that the Artajiri/Arkasisi had a wider scope for diversification and response to environmental and economic shocks than the Menati/Dorpu and Oltoroboni whose diversification options were limited by the little wealth they possess. As pointed out earlier the latter slowly try to shift their position on the wealth spectrum through selling their labour for wages, keeping the Arkasisi/Artajiri's cattle for payment in cattle and earnings from agriculture.

Indeed, for few isolated cases, mining business had impacted positively on the pastoralists' economy. Resources accrued from mining business had changed the pastoralists' life styles. Brokers had material possessions as modern houses, owned motorcycles, vehicles, telephones, and generators for electrifying their houses. Some had initiated other economic activities such as guesthouses in villages and district centres. Their gross income from multiple activities was estimated somewhat above 2,500,000 per month. Nonetheless mining activity also provides them with an opportunity to increase their livestock numbers through purchase.

Rural enterprises and trading

The study villages harbour various trading activities such as Kiosks/shops, food vending (restaurants), guesthouses, clubs/bars, and magenge. Magenge are small scale stores which sell basic foodstuff and other items. These activities are concentrated more in Landanai and Orkutu villages than Kitwai A village. Indeed, Landanai and Orkutu villages were accessible and best for businesses. Earnings per day were estimated as follows: Kiosk/shop (retail) = 5000 - 20,000 TShs; food vending = 6,000 - 10,000 TShs; clubs/bars = 15,000 - 30,000 TShs. and magenge = 2,000 - 10,000 TShs. These kinds of economic activities provided not only essential supplies of goods and services, but also non - farm employment and diversification of sources of cash incomes. The

activities, however, were being undertaken at fairly low levels of operations. Thus, they are ranked much lower in importance compared to livestock keeping and crop cultivation.

Generally wealth accumulated from the different activities enabled an individual and the household to improve their economy. The accumulation was intended to move a household from one wealth category to the other. If an individual lacked cattle, the same would accumulate cattle through purchases and other means. This cattle accumulation was one of the pastoralists' strategies to alleviate poverty.

Hunting and charcoal making

Hunting though at a small scale is practiced in the study villages. There is a hunting company in Kitwai A village though there is no evidence to confirm whether the village benefits from the activities. It was also observed that charcoal making was an economic activity undertaken, particularly in Orkutu Village. Villagers produced charcoal for sale to generate cash incomes. Some Maasai pastoralists acted as middlemen who buy charcoal from the charcoal makers and sell them for a profit. It was initiated by the presence of charcoal markets e.g. Arusha municipal, village centers and such mining centers as Mererani. It was observed that some households, especially in Landanai and Orkutu villages were using charcoal as source of energy for cooking. Though the district authority has banned charcoal making, it still continues as an economic activity (Hamza and Kiwera, 2003). If this activity persist unabated it is likely to leave the land vulnerable to soil erosion and other forms of degradation. This could also have negative impact on agriculture and livestock keeping leading to a failure in poverty alleviation efforts and increased poverty levels.

FOOD SECURITIES, INCOME AND POVERTY ALLEVIATION

Wealth indicators and poverty perceptions

Poverty is a complex, multifactor concept reflecting a low level of well being (Barret 2004). Whereas multidimensional approaches are ideal in assessing poverty in a particular community (Bourguignon and Chakravarty, 2002; Duclos et al., 2003), understanding poverty from the community's perspective help to identify the 'real poor' groups that would need help through policy. The pastoralists during the PRA conducted in the study villages described wealth groups (Table 1). Another indicator was family size. The families with many wives and children, especially male children were perceived wealthier. Pastoralists believed that male children

influence development of families' wealth. They are able to increase livestock numbers through restocking and they maintain the boma when a father dies. A boma is a household usually comprised of several little huts with a thorns fence around them. If the head of the household dies without a male child, his boma will vanish, as no one will nurture the name of the late boma's head. It is also believed that female children accrue wealth to the family through dowry; the findings show that Maasai pastoralists' wealth is more than tangible economic value as there are socio-economic, cultural values attached to it.

The Arkasisi aim at accumulating wealth through increasing number of animals especially cattle. Such people also have the opportunity to diversify their economy by involving themselves in other economic activities like mining, agriculture and trades. Hulme and Shepherd (2003) categorize this category as the non-poor. In attempt to alleviate poverty, this wealth group requires minimal support. They however deserve a collective advantage that a good policy environment would provide. The second category of wealth group is Menati/Dorpu. It always aims at becoming Arkasisi. Their pace of improvement in the standard of life is, however, limited by the wealth (capital) they have. These people are a characteristic of the 'transient poor' (Hulme and Shepherd, 2003). They require medium to high input for them to make significant changes in alleviating their poverty levels.

The last group is Oltoroboni, which is normally not able to increase their wealth. They are naturally dependent and sometimes unable to maintain their families. Children escape from such families to as labourers in wealthy ones. Men from the Oltoroboni group have difficulties to marry due to lack of cattle for dowry. People in this group take most of their time for labour selling to the Arkasisi/Altarjiri for little payment (either in terms of food or cash). In general Oltoroboni own almost nothing for their survival and development. This wealth category is similar to what Hulme and Shepherd (2003) calls 'Chronically poor'. Some members of this category slowly may move up the ladder by means of accumulation from the labour selling into the Dorpu and ceteris paribus may join the Arkasisi. They start by buying small ruminants and sometimes few cattle that multiple over time but surely accumulate wealth (cattle) and slowly may join higher wealth categories. The Arkasisi, Menati/Dorpu and Oltoroboni wealth categories are a typology that illustrates a certain degree of movement between categories as it retains a 'chronically poor' category at the lower level and 'never poor at the apex'. Retrogression may, however, take place and the highest wealth rank may join its immediate lower category.

Maasai livelihood strategies

In the past, the Maasai strategies for sustainable livelihoods were predominantly based on pastoralism.

However, population pressure coupled with conversion of pastureland to agricultural use has had a net effect on the fragile balance between humans - livestock - land in which the pastoral economy rests (Arhem, 1981; Homewood and Rogers, 1991). Over time, pastoralists have diversified their livelihoods. For example, they are now involved in agriculture, mining and trading activities. But income generated from these other activities is invested in buying more cattle so as to become wealthier (Arkasisi). The model (Figure 8) demonstrate that most Arkasisi Maasai community have the opportunity to increase their livestock numbers through resources accrued from other activities like agriculture, mining, and other businesses. The Arkasisi recovers easily from shocks of the weather vagaries as they are capable of maintaining their wealth status. Those who are unlucky, may fall into the Menati/Dorpu or retrogressively join the Oltoroboni, particularly when they lose considerable cattle numbers during years of adverse weather conditions.

Expenditure pattern, poverty level and livelihood strategies

Based on monthly total expenditures (in TShs.), the respondents who spent 10,000 or less; 15,000 - 100,000; 105,000 - 190,000 were 4, 68 and 5%, respectively. In a month 2% of the respondents used 195,000 - 280,000 while 0.6% of them spent 285,000 or more. These expenditures covered for food (meat, milk, cereals) and non-food basic expenses (clothing, school fees, rent, transport, medical, and recreation). When these findings were compared with the 1990 World Development Report that uses both High and Low poverty lines to describe absolute poverty levels at USD370 and USD275, respectively, 99% and 98% of the respondents in the study area were below the World Development Report poverty lines. Only 1 - 2 of the respondents were above the poverty line. They however varied accordingly when the valuation of the assets (cattle and other possessions) was considered. The breakdown of the traditional forms of land use, the ratio of the livestock per capita had dropped and the numbers of poor families had increased leading to socio-economic changes among pastoralists, a trend that is a sign of impoverishment rather than of economic growth and success (Arhem, 1981). Thus, the Maasai pastoral economy had been in a state of involution (Field et al., 1988). Nevertheless, food situation and general standards of living have deteriorated (Arhem, 1981). Maghimbi and Manda (2000) point out that the Maasai in Maasai land are poor despite the presence of animal wealth, which is not appropriately utilised to alleviate poverty.

Conclusion and policy implications

It is clear that the Maasai have been trying to diversify

their economic activities over time in response to changing socio - economic and environmental impulses. Such activities as agriculture, Magenge, Kiosk, shops, charcoal making, guesthouses and mine brokers, that did not exist in the villages are currently growing. Though the diversification strategies have benefited some few individuals, the majority are still poor and becoming poorer. Women in the pastoral community are poor as they are marginalized and do not have access and decision on family resources other than taking care of calves, and small ruminants. Livestock keeping play a great role in the Maasai livelihood than mining and trade.

There are Altajiri/Arkasis, Menati/Dorpu and Oltoroboni wealth categories in the study area. Their strategies for alleviating poverty differ depending the resources they have and the options available to them. Resources in the villages are unevenly distributed and in fact they are dwindling such that the decrease increases the vulnerability of the pastoralists to poverty.

Recommendations

Due to different categorization of the poor, an intervention for poverty alleviation must take into consideration these groups as they have different perceptions, aspirations and capacities. Small - scale village credit schemes (VICOBA - Village Community Banks) if enhanced may provide the pastoralists with enabling environment for self - employment. This should be accompanied with improvement in access to land through relevant policies. The Oltoroboni and Menati wealth groups are priority beneficiaries of this. The Altajiri/Arkasisi wealth group earn enough for a suitable living (as perceived by this group), they prefer assured subsistence to risky high productivity. Their income, however, may be improved further through VICOBA, improvement in road network and having in place supportive marketing systems that need to be emphasized through relevant policies.

Goats raising particularly beef and dairy goats may improve pastoralist because of the expanding market for goats with buyers coming from Mauritius and Seychelles. The logic of raising goat is increasing due to the constricted options available in this semi arid region. Both agro - pastoralists and pastoralists, by investing in goats, are likely to respond to future uncertainty in traditional production systems, shrinkage of pasturage and lack of control over grazing resources. It should, however, be noted that the general problem of operating in a monetary economy is that pastoralism is essentially a 'slow - response' system; the reproductive cycle of livestock is not adapted to making major changes in strategy over a short period. It is therefore important that diary animals are reared along with the ones for beef

The study proposes that efforts must be made to ensure that there are adequate water points in the study area. If the water availability, supply and access are improved, it is likely to have a multiplier effect. For

example, healthy herds that could fetch higher prices, horticultural activities may be practiced and more time will be spent on the socio - economic activities and less on the search for water. Similarly veterinary services should be improved based on the agriculture and livestock policy. However, as the Livestock Policy portrays, successes of such a move will highly depend on ability of the clientele to pay for the services. This means (as the trend has started to demonstrate) that privatisation; though a step in the right direction may not in the near future, help the rural poor, notably subsistence pastoralist herders. As such, the gap left by the government withdrawal from provision of private veterinary services will be much more felt in rural areas than in urban or per -urban areas, where private veterinary services is prominent (Rutabanzibwa, 2001).

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REFERENCES

- Ahmed, Al GM (1987). 'National Ambivalence and External Hegemony: The Neglect of the Nomads in Sudan'. In Salih, M. A. M (ed) *Agrarian Change in the Central Rain lands of the Sudan*. Uppsala: Scandinavian Institute of African Studies.
- Arhem K (1981). *Maasai Pastoralists in Ngorongoro Conservation Area: Sociological and Ecological Issues: Research Paper 69: 29-30*.
- Barbier EB (1999). *The Economics of Land Degradation and Rural Poverty Linkages in Africa*. In Proceedings of the UNU/INRA Annual Lectures on Natural Resource Conservation and Management in Africa. United Nations University Press, Tokyo.
- Barrett CB (2004). *Rural Poverty Dynamics: Development Policy Implications*. Paper presented to the 25th International Conference of Agricultural Economists Durban, South Africa.
- Bourguignon F, Chakravarty SR (2002). "The measurement of multidimensional poverty," DELTA working paper.
- Boyde HK, Westfall R, Stasch F (1981). *Marketing Research: Tests and Cases*. Richard D. Inc., Illinois.
- Borgerhoff MM, Ruttan LM (1999). *Identifying conservation acts: putting games in anthropology's tool kit*. In *Behavior and Conservation*, edited by L. M. Gosling, W. J. Sutherland, and M. Avery. Cambridge University Press, Cambridge, U.K.
- Chambers R (1992). *Rapid Appraisal: Rapid Relaxed and Participatory*. Discussion Paper No. 311 IDS Publication, University of Sussex, Brighton, England.
- Christiansson C (1988). *Degradation and Rehabilitation of Agropastoral Lands-Perspective on Environmental Change in Semi-arid Tanzania*. *Ambio* 17(2): 144 - 152.
- Duclos JY, Sahn D, Younger SD (2003). "Robust Multidimensional Poverty Comparisons," Université Laval working paper.
- Field CR, Moll G, Sonkoi C (1988). *Livestock Development Ngorongoro Conservation and Development Project. Technical Report Paper No.1, March 1988*.

- Hamza KFS, Kiwera EE (2003). Survey on planned charcoal burning in Naberera 2003 village in Simanjiro District: Local Management of Natural Resources Programme. LAMP Programme, Faculty of Forestry and Nature Conservation, Sokoine University, Morogoro.
- Homewood K, Rogers WA (1991). *Maasai Ecology: Pastoralist Development and Conservation in Ngorongoro, Tanzania*. Cambridge University Press, Cambridge, UK.
- Hulme D, Moore K, Shepherd A (2001). Chronic Poverty: Meanings and Analytical Frameworks. CPTC Working Paper 2.IDPM, University of Manchester, IDD, University of Birmingham.
- Hulme D, Shepherd A (2003). Conceptualizing Chronic Poverty, World Development, forthcoming.
- Little PD, McPeak J, Barrett C, Kristjanson P (2008). Challenging Orthodoxies: Understanding Pastoral Poverty in East Africa. *Development and Change* 39(4): 585-609.
- Maghimbi S, Manda P (2000). Poverty and Gender Division of Labour among the Maasai of Simanjiro District. REPOA, Dar Es Salaam.
- Mbonile MJ, Mwamfupe DG (1997). In-Migrants and their Impact on Land management: A case of Usangu Plains, Tanzania. *Tanzan. J. Popul. stud. Dev.* 7: 1-2 (July).
- McCracken J, Pretty J, Gonnay G (1988). *An Introduction to Rapid Rural Appraisal for Agricultural Development*, IIED, London.
- Mung'ong'o CG (1995). *Social Processes and Ecology in Kondoa Irangi Hills, Central Tanzania*. PhD Dissertation. Arash Tryck and Forlag, Stockholm.
- Mung'ong'o CG, Mwamfupe DG (2003). *Changing Livelihoods of Migrant Maasai Pastoralists in Morogoro and Kilosa Districts and their Impact on the Environment*. REPOA, Dar Es Salaam.
- Erikson N (1999). *Land conflicts between commercial farmers and pastoral Maasai - A case study on unauthorized cultivation in simanjiro district*. Lund University, Faculty of Law, Sweden. (Thesis).
- Pillai P (2001). *Poverty, Environment and Sustainable Development*. World Bank, Washington D.C.
- Potkanski T (1994). *Property Concepts, Herding Patterns and Management of Natural Resources in Ngorongoro and Salei Maasai of Tanzania*. Pastoral Land Tenure Series No. 6. IIED, London.
- Raikes PL (1981). *Livestock Development and Policy in East Africa*. Scandinavian Institute of African Studies, Uppsala pp 254.
- Rugumamu W (1989). *Environmental Degradation and Conservation Practice in Tanzania*. Paper presented at the DANIDA/SADET Seminar held in Arusha, 19th October, 1989.
- Rutabanzibwa AP (2001). *Veterinary legal reform in Tanzania in: Ministry of Water and Livestock Development (2001), "Proceedings of the 2nd Stakeholders Workshop to Review and Finalize Recommendations for Changes to the Veterinary Surgeons Ordinance to make Provisions for the Delivery of Animal Health Services by Para-veterinary Professionals in Tanzania"*.
- Salih MAM (1987). *Agrarian Change in the Central Rainlands of the Sudan*. Uppsala: Scandinavian Institute of African Studies.
- Thompson M, Homewood K (2002). Elites, entrepreneurs and exclusion in Maasailand. *Hum. Ecol.* 30(1): 107.
- William CMP (2002). *The Implications of Changes in Land use of Forests and Biodiversity: A case of half Mile Strip on Mount Kilimanjaro, Tanzania*. Masters Dissertation. University of Dar Es Salaam, Dar Es Salaam.
- Yanda PZ (1995). *Temporal and Spatial Variations of Soil Degradation in Mwisanga Catchment, Kondoa, Tanzania*. PhD Dissertation Series No.4, Department of Physical Geography, Stockholm University, Stockholm pp 136.