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# Household Resource Capabilities and Risk Perception in Dryland Areas: Implications for Development Interventions.

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## ABSTRACT

This study investigated household risk challenges in dryland areas. In order to support livelihoods in these areas, various government and non-governmental development agencies are involved in diverse interventions. The study objective was to determine household resource capabilities and risk perceptions that affect development interventions in dryland areas. The study was carried out in the semi-arid area of *Buuri* and *Abothuguchi* West divisions, also called the Northern Grazing Area(NGA), Meru Central district in Kenya. Quantitative and qualitative techniques were used to collect primary and secondary data from 68 households and development agencies working in the area. Data was analysed by statistical analysis using SPSS. Study results established that average age of household heads was 47 with a household size of 6(50% males, 50% females) and gender household head proportion of 81% male and 19 % female. 62% of household heads were educated up to primary level and in terms of places of origin, 79% came from the *Imenti* sub tribe while *Tigania* sub group was represented by 13% of the sampled respondents. The results further found that households in the area mainly possessed physical, financial and social capital assets. Physical assets were inform of land(80%) and livestock (poultry,78%; sheep and goats, 33%; and cattle, 15%). In terms of financial assets, the main sources were crop sales(60%), livestock(52%), and off farm activities(40%). Social capital was mainly in form of borrowings from relatives (50%); begging (46%); and dependence on relief food supplies (35%). Findings also show the main sources of household risks included drought (98%); human diseases (85%); and famine (81%). Others were technological risks (factors limiting crop and livestock production) (78%); financial(factors limiting financial entitlements e.g. lack of non-farm employment)(65%); insecurity (cattle rustling and tribal conflicts)(60%); and lack of enough land for farming, lack of domestic water and large family to feed(28%). The study recommends the reduction of dryland household risks to the enhance adoption of appropriate livelihood practices advocated by development agencies. In policy terms, the study calls for partnerships in the implementation of development programmes. In broad terms, three principles are recommended for ASAL development i.e. Active involvement of the local people and their practices; Strengthening of local resources; and establishment of linkages between endogenous and exogenous resources (i.e. coherence).

**Keywords**
Arid and Semi-arid Lands; Drylands; Development Interventions; Household Resources; Household Risks; Kenya; Livelihoods; Meru District; Risk Perception.

## 1. Introduction

Kenya lies between 34° and 41°45′ east and between 5°20′ and 4°45′ south with an area of 582,646 $Km^2$ (FAO 1993) and a population estimated at 28.9 million[1] (Kenya Economic Survey, 2000). Over 70% of the population is concentrated in about 10% of the land area in the high land regions.Increasing population is placing pressures on resources in these areas causing migration to lower potential agricultural lands (FAO, 1993). The country is broadly divided into seven agro ecological zones (AEZs), based on rainfall and mean annual temperatures. Only 13% of land in Kenya is classified as high potential to medium with an equivalent area being potentially arable but subject to periods of droughts (FAO 1993:2). The remaining area is arid and semi-arid lands (ASALs). Other natural resources to sustain and expand economic activities are limited. Tourism has however, always represented a high income market, but it is evident that Kenya needs to further exploit its most valuable natural resource asset i.e. agricultural land (FAO 1993). Although the share of the Gross Domestic Product (GDP) has declined, agriculture still continues to dominate the Kenyan economy and accounts for about 1/3$^{rd}$ of the total GDP and provides a living for over 80% of the population.

One of the most critical challenges facing Kenya at the moment is reduction of poverty (Kenya Economic Survey, 2000). Poverty assessment has been based on norms and identification of minimum requirements for food and non-food expenditures. As at 1997, the food poverty line was KShs 927.1[2] per month per adult equivalent for rural areas. In rural areas, the proportion of poor households is nearly equal for men and women, 52.3 and 54.1 percent respectively. Hence female headed households are not more prone to poverty than male headed households although this does not mean both men and women have equal access to resources like education, land among others (Kenya Economic Survey, 2000:9).

Drylands (ASALs) are characterised into various zones according to rainfall pattern, amounts, etc. The Northen Grazing Area(NGA) of Meru Central Disitict is is semi-arid characterised by Savannah and tropical scrub vegetation. The area has potential for grazing with possibility of rain-fed agriculture but with hazards and rainfall of between 300-800mm per year. Inter annual rainfall variability of 25-50% distinguishes the area from high potential areas (Dixon et al 1989:3). Populations in the NGA are therefore frequently exposed to harsh conditions, often leads households to make risky livelihood choices. Consequently, this article presents the results of a descriptive study, whose overall objective was to determine household resources that affect households' risk perceptions in the semi-arid north region of Meru Central District in Kenya. Specific study objectives were therefore to:

a) Characterise households in *Buuri* and *Abithoguchi* West Divisions;
b) Determine the household resource capabilities in *Buuri* and *Abithoguchi* West Divisions; and
c) Establish household risk perception in *Buuri* and *Abithoguchi* West Divisions.

## 2. Literature Review

### 2.1. Drylands

About 1/3$^{rd}$ of the world's land surface area is formed of drylands that support a population of over 850 million (Dixon *et al* 1989). However, over the past two decades, it has become clear that many dryland areas are exhibiting symptoms of over use and inappropriate management of resources. This has led to the destruction of the biological and physical resources of the land hence enhancing further risk to the communities. In addition, Scoones *et al* (1996:3) states that risks in drylands are caused by the variability in rainfall, impacts of crop pests and diseases or soil fertility, all which lead to food shortages.

A large number of people depend on drylands for their livelihood and there is need for sound practices that will protect the

[1] Provisional results of the 1999 census.
[2] 1 US Dollar = 74 Kenya Shillings (July, 2000).

resources. Apart from the micro variables, risks in drylands are also caused by macro factors e.g. national economic policies, assurance of security by the state and so forth, all of which cause hazards to livelihoods. To understand the risks, contexts beyond individuals or households need to be understood i.e. social relations and economic policies that affect for example price levels, market functioning, infrastructure and service support levels. Important also are the influence of external actors that shape and affect/influence dryland livelihoods options i.e. government extension workers, development projects or religious leaders.

**2.2. Dryland Livelihoods**

Drylands are commonly perceived as poor, backward, drought prone and environmentally prone. However, these areas are inhabited by people. When there are adequate rains in these areas, the environment is changed and there is green grass, cropping and along the hill sides are covered with green trees, as described of the *Chivi* dryland area in Zimbabwe (Scoones et al 1996:18). To meet livelihood objectives, people in drylands engage in a variety of activities to manage risks. Firstly, they engage in farming that exhibit a lot of pitfalls including variability in season quality leading to dramatic crop output fluctuations (Scoones *et al* 1996:27). Food security only becomes reliable through increased crop storage and emphasis on opportunistic dryland cropping concentrating on small grains i.e. sorghum and millet. The risk of crop failure is also offset by ownership of livestock assets and opportunities for local exchange in risky periods. Secondly risks are also managed through livelihoods mediation by a range of networks, institutions, and organisations (Scoones *et al* 1996:34). Therefore, individuals are not alone in their pursuit of livelihoods; they are part of the social fabric making up the rural society. Even in modern agriculture that is characterised by individualism, in extreme times of hardship, networks are re-established and cooperative behaviour become evident.

The third livelihood activity households engage in dryland areas are income generating in nature and used to meet needs of their families. Reardon (1997:737) argues that the share of non-farm income in the farm households is substantial. Non-farm income is generated from local non-farm employment, local non-farm self-employment and migration income. In general, non-farm activities in the rural areas comprise of: Employment in rural non-farm labour market e.g. casual labour at road construction sites in the rural area; Self-employment in local non-farm sector e.g. local family businesses; Employment in migration labour e.g. working in cities; and Employment in farm labour market e.g. on irrigation farms. In dryland conditions though, due to high environmental variability household incomes tend to unreliable. Need to diversify for other sources of off farm income then becomes important (Reardon 1997:735). Diversification of income by the rural households is done for the following specific reasons: To reduce risk by diversifying *ex ante;* To maintain food security (income and consumption) in the face of low farm productivity and shocks like drought, by diversifying *ex post; and* To earn cash income to finance farm investment, due to credit market failure. In the semi-arid areas, non-farm activities are concentrated in the dry seasons (Reardon 1997:739). Other than depleted food stocks at this time, the explanation for this behaviour is that during dry season remittance income from seasonal migration, earnings from local non-farm activity and cash from crop sales are available to buy non-farm goods and services. The fourth survival livelihood strategy for dryland households is the supply of migrant labour. Migrant labour economies rely on supply of casual labour in various sectors e.g. mining, towns and on commercial farms. Lower wages, poor conditions and insecurity of this employment attracts mostly men during times of hardships like drought (Scoones *et al* 1996: 37). Also relative returns from formal employment versus agricultural income determine migrant labour. Increased wages and improved conditions are attractive to men mostly, especially in drought prone areas. In this situation, participation in full time employment has become a characteristic livelihood strategy of the rural areas. This is because, in conditions of high environmental uncertainty and diminishing resource base, agricultural or livestock production is insufficient to sustain households.

As a fifth strategy, households engage in self-employment to survive. Self-employment is the main manifestation of rural non-farm economy in Africa (Reardon 1997: 740). Majority of the small businesses start with one person and are run on family basis, mainly as a survival option. Generally, studies show that: Where agro-climate is poor, households tend to earn more from migration than from local non-farm activity; The more dense the infrastructure and population, the greater

the earnings from rural farm sector; and Forces outside the rural economy (especially in cities) influence the labour use in the rural non-farm economy. Finally, households also depend on extension services provided by the state to survive. However, extension services do not often consider the special needs of dryland communities. It generally retains focus on high input, technological solutions to farming problems, tending to underestimate the problems of risk prone, resource poor farmers (Scoones *et al* 1996:39). For example experiences in *Chivi* area in Zimbabwe show that after independence in 1980, research has been redirected towards the needs of small scale sector with increased attention to drought resistant crops like millets and sorghum, water harvesting technologies and drought power issues. However, despite this shift, there was no major technological break-through appropriate to resource poor in dry areas, nor has research had much impact on the types of recommendation offered by the extension services (Scoones *et al* 1996:39). Often NGOs step in to complement the government by promoting community based development in drylands, for example tree planting, water development and farming, soil and water conservation programmes.

### 2.3. The Rural Household and Its Resources

From the literature, it seems there is no general consensus on the definition of a household. Households in all diversity show the different ways in which kinship is organized (Van Driel, 1994). FAO (1992) defines a household as a socio economic unit consisting of individuals who live together with an aim of basically providing themselves with food or inessentials for a living. Ellis (1988:12) describes households as peasants with access to their means of livelihood in land, utilising mainly family labour in farm production and always located in a larger economic system. Senauer *et al* (1988) however consider the income aspect and define a household as "a group of individuals who reside together, pull all or most of their income and basically share the same food supply. Studies have shown that rural households don't always have same interests, needs, access to natural resources, options for obtaining a livelihood and so forth(van Andel 1998:15) and so individuals in a given household necessarily do not have common interests. Therefore, the distinction between household types and their individual members is important when considering factors like access to resources, livelihood, the production and reproductive division of labour, living standards and interests (Guyer 1980, Berne's 1983, Palmer 1985, Guyer 1986, Moock 1986 cited in van Andel, 1998:16). Rural households often are referred to as farmers. However studies now show that farmers are not only engaged in agricultural activities because their livelihoods increasingly entail migratory work, petty trade and other forms of off farm and on farm non-agricultural activities (Hebinck and van der Ploeg , 1997).

According to Carney (1998), every household has access to some form of resources/assets on which it derives a living. Understanding the level and quality of these assets gives a clearer picture of household resource base. Carney (1998:7) has identified five types that are endowed by households. These include a) *Physical Assets* - farm size, livestock ownership, farming enterprises, agricultural implements and shelter; b) *Human Assets* – household size, literacy levels, level of skills, employment level, etc.; c) *Financial assets* – income portfolio, savings, credit supply remittances and pensions; d) *Social capital* - percentage of income from remittances, gifts and transfers, group participation, reliance on support networks and access to wider institutions of society; and e) *Natural capital* – soil fertility, water availability, tenure arrangements, access to common property, and climate patterns.

### 2.4. Risks in Drylands

Measurement of risk in itself is problematic and this could be the reason for the haphazard interventions we see. Very often, risk and uncertainty are commonly used interchangeably, however, in economic terms, they are different. ***Risk*** can be defined when probability distribution of stochastic (random) variable is known, in tandem with argument by van Kotze and Holloway (1996) who define risk as the expected losses (lives lost, persons injured, damage to property and disruption of economic activity or livelihood) caused by a particular phenomenon. However, u***ncertainty*** is associated with incomplete knowledge and may take several forms e.g. physical characteristics of dryland resources and impacts of human activity may not be fully known (Dixon *et al* 1989: 78). The communities living in the drylands are often faced with difficulties that affect their livelihoods due to variability imposed by various factors. In the dryland context, there are various

sources of risk and uncertainty, some of which are unreliable rainfall pattern, impacts of crop pests, heterogeneity of soils, unexpected deaths and sickness. Others are heavy rains that cause floods and water logging, and weeds. Also there are macro variability factors due to changes in market conditions, shift in wage levels and adjustments in the wage policies. Forms of risks that affect production in the drylands include rainfall, drought, windstorms, floods, fire, lightening, hails, frost and freezing. Also we have animal and plant diseases. Because of the various unfavourable conditions, food and income conditions are always uncertain. There are also natural processes that lead to risks faced by communities living in drylands i.e. erosion, salinization, and degradation. These lead to on site effects like changes in physical yields, damages to property and shifts in the productivity of natural resource base. Other effects are offsite environmental impacts imposed on the producers and members of the community.

Pathways linking the activities that cause risks and uncertainties are difficult to predict or specify. However, using the dryland production systems, all the risk variables can be classified into three separate categories for analysis purposes (Dixon *et al* 1989:166): *Determinist Variables*-variables known with complete certainty e.g. predetermined stocking rate, etc.; *Stochastic Variable*-variable known in probabilistic terms e.g. rainfall, insect plague occurrence, etc.; and some variables/events are totally unpredictable e.g. social upheavals or natural disasters.

### 2.5. Household Risk Perception

Perception of risk is a social process i.e. it emerges from complex interactions of history, politics, socio economic conditions and institutional dynamics (Scoones *et al* 1996:7). Huijsman (1986:4) argues that the recognition that farmers' aversion to risk may potentially impede agricultural development and cause increased income disparities in the rural areas. This has led to a growing interest in research on the influence of risk on farmers' decision making. According to Moscardi *et al* (1977:711), attitudes towards risk are major determinants of rate of diffusion of new technologies among peasants and outcome of rural development programmes. If these programmes are to be effective, new technologies and rural development programmes need to be tailored to the attitudes towards risk of particular categories of peasants.

Individual farmers, research scientists, extension workers, politicians, etc., see hazards of everyday world through different ways (Scoones et al 1996:151). The way risks are perceived and responded by households is based on various factors. These include educational background, gender, age, history and personal experience, attitudes and peer pressure. Farmers' perceptions of drought/risk for example give a variety of causal explanations that ascribe blames and a route to coping with the situation. According to Scoones et al (1996: 15), coping with risk and uncertainty in dryland areas is much about dealing with personal, religious and political ramifications of drought impacts as the material issues of food provisioning and survival.

## 3. Method

### 3.1. Research Design

The assessment of household resources and risk perceptions need to be undertaken from a holistic and people focused perspectives. This recognises the socio economic nature of risk perception by the households. To be able to acquire and identify information to answer the research ojectives, unit of analysis included individuals, households, two villages, and organization (i.e. the Private, Government Agencies, and NGOs/Community Based Organisations (CBOs). The study area had diversified agro ecological zones with two extremes, the drier lower part (tending towards arid zone) and upper less dry zone (tending towards the high potential area). To be able to understand the diversity of household asset endowments and risk perceptions, an in-depth study of the two extremes was carried out at village level. Before field work commenced, initial meetings were held with district/divisional policy makers (government ministries, NGOs etc.) to explain the purpose of the research. This was followed by preliminary vists to the study area to familiarize with the general conditions and development interventions. Detailed discussions were held with key persons and development organisations in the area. This resulted into the identification of the two villages for survey. Data was collected with the support of two

research assistants. Finally, a stakeholder workshop was held to share the preliminary findings of the research.

### 3.2. Research Methodology

The methodology used for this study involved both qualitative and quantitative research techniques. The quantitative component involved collection of socio economic data at household level through a standard questionnaire. The qualitative component focused on understanding people's constructs i.e. things people believe exist based on their experience and not directly measurable. Data was collected through i) secondary data review(annual reports, project reports, field evaluation reports, including government documents like the Central Bureau of Statistics and Line Ministries); ii) Open ended interviews with Key Informants (opinion leaders, government officers, NGO staff among others); iii) Farm Household Survey through the administration of questionnaire that had been pilot tested; and iv) *Other Data Collection Methods* that included NGO, MoA and local leaders meetings. The meetings were attended by the researcher as a *Participant Observer.* At the end of the research period a *Stakeholder Workshop* was held to check the collected data, presented preliminary data to the stakeholders and collected more data in areas where inadequate information had not been collected.

### 3.2. 1. Sample and Sampling Procedure

***Selection of Study Area***

*Mugae* sub location (*in Buuri* division) and *Ntumburi* sub location (in *Abothuguchi* division) in Meru Central District were chosen for the study due to a number of factors. First, the area represented the former northern grazing area(NGA) used for grazing purposes (pre-colonial periods) and settled in by migrant farmers from the high potential areas of the district who are are involved in different practices to meet livelihood objectives in a changed environment, different from the original environment. Secondly, the area frequently experiences drought incidents and is classified as semi-arid and exhibits conditions for ideal drylands. Thirdly, although national policy makers consider Meru central district as high potential agriculturally and self-sufficient in food production, the area exhibits completely different climatic conditions with problematic agricultural activities that expose communities to vulnerable situations. Lastly, no documented similar study has been carried in the area.

***Sampling Procedure***

A total 80 households were randomly sampled from *Ntumburi* sub location and *Mugae* sub location. Based on information from the Provincial Administration, agencies working in the area e.g. Ministry of Agriculture (MoA), Non Governmental Organisations (NGOs) and Faith Based Oraganisations (FBO) and key informants, *Thiira* Village[3] (154 households) in Ntumburi sub location was selected for the survey. By contrast, village units in *Mugae* sub location reportedly had fewer households. Therefore, nine units[4] were selected with a total of 97 households for the survey. Kathare unit in this sub location had potential for irrigation because of the Isiolo River passing through the area. The two areas (Ntumburi and Mugae) for the survey were selected because physically, they present contrasting characteristics. For example, *Ntumburi* has more or else permanent settlement and boarders areas that are agriculturally medium to high potential, whereas *Mugae* borders arid and highly volatile Isiolo district due to tribal conflicts between pastoral communities (*Somali* and *Borana* sub tribes). The sample frame was lists of resident households in *Ntumburi* and *Mugae* sub locations prepared by the local assistant chiefs. From the lists households for interviews were selected randomly. In *Ntumburi*, every after 4$^{th}$ household was selected from the list of 154 provided but in *Mugae* every 3$^{rd}$ household was selected from list of 97 households. 40 households were selected from *Ntumburi* and another 40 from *Mugae* for the interviews. Only 68 households however, were successfully interviewed. In *Mugae* sub location 32 households were interviewed while in *Ntumburi* sub location, 36 households interviewed. 12 households could not be interviewed because they were absent[5].

[3] The most import a characteristic of a village also locally called unit is the headman, an official link to the provincial administration.
[4] Mugae units were small, possibly because of the recent and continuing in migration than Ntumburi. Also land tenure system was incomplete in Mugae hence administrative structures in the sub location are still weak.
[5] Some households had all the members away searching for livelihoods e.g. casual labour and other had migrated to other areas due to drought that was being experienced at the time of the research.

## 4. Data Analysis

Since the researcher was the main gatherer and recorder of data, data analysis was an on-going process starting from the field. In terms of qualitative factors, summaries were compiled from the household interviews to describe patterns of resource endowment and risk perception. For the quantifiable factors, statistical analysis was performed using SPSS. It involved compiling frequency distributions, calculating means and tabulations. An independent T-Test was carried out to test statistical significance at $p<0.05$. Data collected was also checked through observations and during the Stakeholder Workshop. To check the validity of data collected, different methods were used to answer similar questions.

## 5. Results and Discussion

### 5.1. Household Resources

#### 5.1.1. Farm Households[6] Characteristics

The characteristics of the household studied are shown in table 5.1. The diversity in the household characteristics was an important aspect of understanding why households possess different asset and risk perceptions as they pursue their livelihood choices.

**Table 5. 1 Household Characteristics**

| ***Characteristic*** | |
|---|---|
| Average age of household head | 47.47(14.88) |
| Average Family size | 6.19(2.65) |
| Average Female members per household | 2.87(1.64) |
| Average Male members per household | 3.32(1.82) |
| Percentage household heads | |
| Female | 19.2% |
| Male | 80.8% |
| Percent household heads educated up to primary level | 61.8% |
| Household Originality/Ethnicity | |
| Percentage from *Imenti* | 79.3% |
| Percentage from *Tigania* | 13.2% |

Figures in parentheses are Standard Deviations around the mean.
Source: Survey Results, 2000.

Results in Table 5.1 show that household size of the respondents was 6 members with a standard deviation of about 3. The smallest household of 3 was perceived by households to be better off because there was less stress on the already limited resources and vice versa for the bigger household ds. The composition of average family comprised of about 3 male and 3 female members (Table 5.1) suggesting a relatively equal gender distribution within the farm households. The average age of the household head respondent was 47, with standard deviation of 15. This indicates that the youngest household head was 32 and oldest 59. The livelihood objectives adopted by the younger families differed for example due to the fact that older families may have been receiving remittances from their children working elsewhere. The level of education of the household head may influence adoption of certain livelihood strategies. For example, household heads in the area that had at least form four level of education were in formal employment with salaried income and therefore able to acquire inputs for farming and plant early compared to the less educated counterparts. They were also able to educate their children in better schools and so assured them with a better future than the families without extra income. 62% off the household heads (Table 5.1) said they were educated to primary level, only 17% were educated to secondary level. The study also showed that 82% of the households were involved in farming activities only, while 7% and 9% were involved in non-farm activities (self-employment) and formal employment respectively in addition to agriculture. This implies that although majority households still depend on agriculture for their livelihoods, there are those who are constantly engaged in other activities other than agriculture or combine agriculture with other activities to secure their livelihoods. The distribution of

[6] A household according to the community is a group of people eating from the same pot and depend on one farm plot.

places of origin of households was between the *Imenti* and *Tigania*, only a few people have come outside Meru tribe. 79% of respondent households said that they were of Imenti sub tribe, 13% from Tigania sub tribe and 7% other tribes outside the Meru tribe (see table 5.1). No household interviewed said they came from *Igembe* or *Muthambi/Mwimbi* clans. The places of origin are currently densely populated but with more potential for agricultural production. Some households said that they go to their original places to seek for support during hard times. The presence of the *Tigania* and *Imenti* leads to sporadic boundary conflicts at the lower side where the two sub tribes have traditional cultural differences. 91% of the household heads said they do not migrate outside the area to seek for other opportunities or otherwise and so the locally available resources are very important to them in their bid to pursue their livelihood objectives. An explanation for this is probably related to the reasons of migration of the families in the first place. It was reported that majority of the households were poor and had land problems at their original places of origin, and with low education. Once settled in the area they try so hard to cope with the situation and not seek for opportunities elsewhere. 78% of the sample households were headed by married men, only 4% of the households was headed by women whose husbands were living elsewhere. 15% of the households were headed by females due to separation, divorce, widowed or single by choice. Women play a key role in farming systems of the survey area. In addition to supplying labour inputs for production, women play important role in decision making as *de facto* or *de jure* heads of households. However, women often lack access to productive inputs like land, labour, capital and information. This leads to differences in risk coping between male and female headed households.

### 5.1.2. Household Physical Assets

Most of the households reported that their physical assets to include land and livestock. Land size of the households was an important aspect that influences the diversity of crops they grow. 10% of the respondents said they were squatters without land of their own, while majority of households (53%) owned land between 1 to 5 acres and 27% of the households had land of more than 10 acres (table 5.2).

**Table 5. 2 Sample household summary description of land size ownership**

| Household Land : Range/status(acres) | Frequency | Percentage |
|---|---|---|
| Squatter(0) | 7 | 10.3 |
| 1 to 5 | 36 | 52.9 |
| 5 ≤10 | 7 | 10.3 |
| > 10 | 18 | 26.5 |
| TOTAL | 68 | 100 |

Source: Survey Results, 2000.

Results also show that most of the households (78%) owned poultry (table 5.3). Accordingly, each household own an average of 7.07(8.30) poultry. Table 5.3 also shows that the average of other livestock numbers owned per household were cattle 2.19(2.69); and sheep and goats 3.09(4.38). Households produce milk for their own use and although yields are low, milk sales are a significant source of income.

**Table 5. 2 Household mean Livetsock Ownership .**

| LIVETSOCK | Frequnecy(%) | Number owned |
|---|---|---|
| Cattle | 15(22.0) | 2.19(2.69)[7] |
| Sheep and Gooat | 23(33.4) | 3.09(4.38) |
| Poultry | 53(78.0) | 7.07(8.30). |

Source: Survey Results, 2000.

Since the area has few sources of water and poor road networks, oxen carts play a vital role in the transportation of water and farm produce. Generally, sheep and goats are kept for cash sale to raise funds for urgent finance needs like school fees or in times of crop failure. Most of the livestock are local breeds i.e. *Zebu* cattle and Small East African goats, and some cross bred cows have been introduced by farmers in *Ntumburi* where livestock thefts are less ramphered compared to the

[7] The figure in parentheses indicate the standard deviation around the mean.

*Mugae* area at the lower side of the study area. Lack of water is one of the main constraints limiting livestock production. It was noted that during times of drought, it takes about a half day to water livestock.

### 5.1.3 Household Financial Resources

Access to financial resources e.g. money, remittances, etc. to people in vulnerable environment is critical for their ability to meet the challenges of unpredictable circumstances. It was noted that financial resources are one of the key challenges households face. Diversification of financial sources was mentioned as a strategy for household fincial security, see table 5.4.

**Table 5. 4 Most important sources of income for households**

| *Income source* | *Frequency* | *Percent* |
|---|---|---|
| Crop sale | 41 | 60.3 |
| Livestock sale | 35 | 51.5 |
| Off farm activities | 27 | 39.7 |
| Wage labour | 18 | 26.5 |
| Remittances | 4 | 5.9 |
| Other | 11 | 16.2 |
| (Sample size 68) | | |

Source: Survey Results, 2000.

**Table 5. 5 Sample households description of their annual cash incomes sources**

| SOURCE | MEAN INCOME |
|---|---|
| Crop Sales | 19,878.24(87,595.65) |
| Livestock Sales | 6,188.38(23,816.09) |
| Off Farm | 5,594.71(15,567.89) |
| Wage Labourer | 7,088.03(24,791.66) |
| Other | 546.62(2901.90) |
| TOTAL HOUSEHOLD ANNUAL MEAN INCOME | 39,295.98 |

Figures in the parentheses are standard deviations around the mean
Author's Calculations



To diversify their financial income sources, households had different sources of incomes (see table 5.4). Income from crop sales, reported by 60 % of sampled households was the most important source of income. Livestock sale income was reported by 52% respondents as an important source of income. The large deviations for the two sources show that different households are accessible to diverse resources for crop and livestock production, (see table 5.5). 40% of households sample reported that they generate income from non-farm activities. Generally, poverty[8] was the reason for the government's decision to settle people in the study area. Therefore the majority poor farmers were constrained on investments in farming and this leads to low productivity and unreliable farming. There was also limited cash cropping opportunities, including limited opportunities for income generation activities minimises income levels. Further, poor infrastructure only makes the income generation from crops worse and farmers' produce subjected to poor pricing regimes.

### 5.1.4 Household Social Capital

Social capital is considered critical to households whose other forms of resources are constrained. The sample respondents reported when their own resources are exhausted, they rely on other arrangements for survival. This aspect was investigated[9] and the following responses were recorded, (see table 5.6).

[8] Overall poverty line for rural areas is Kshs 1,238.9 per month per adult equivalent(Kenya Economic Review, 2000).
[9] Households were asked about participation in local institutions and reliance on other people for support.

**Table 5. 6 Farm household dependency on Social Institutions.**

| *Characteristic* | *Frequency* | *Percentage* |
|---|---|---|
| Relief food | 24 | 35.3 |
| Borrow from relatives | 34 | 50.0 |
| Begging from relatives | 31 | 45.6 |
| Remittances | 4 | 5.9 |
| Govt. transfers/pension | 0 | 0.0 |
| Labour exchange | 3 | 4.4 |
| Participating in group activities | 53 | 77.9 |
| (Sample size | 68) | |

Source: Survey Results, 2000.

35% of sampled households reported to rely on relief food from Faith Based Organisations and the government (through the Provincial Administration). Organisations working in the area work through self-help groups or FBO groups. Generally group formation in the area is encouraged by the perception that external assistance is usually channelled through these structures. 50% of the respondents reported they borrow money or food from relative (residing locally and places of origin) during extreme times of hardship and pay back later when risky condition ease out. Begging from relatives (for food) was reported by 45.6% of the sampled households when times are hard. Remittances as a survival gimmick was however low (6%), because not many families have members working elsewhere for income generation. The most important social support system that stood out was through self-help groups. 78% of the respondents said they participate in self-help groups. Some of the groups have more ambitious schemes like *merry go round* or group tree nurseries to promote income generation and environmental conservation activities respectively.

### 5.2 Sample Households Risks

The study area exhibited harsh environmental conditions and the risks as reported by the households can be categorised as physical/environmental, social, technological, health and financial risks. Physical risks comprise of stochastic risks like drought. 99% of the sample households reported drought as a source of risk (see table 5.7) and causes crop failure. They also have to walk long distances to water their livestock as a result of prolonged droughts. Social risks included insecurity due to tribal conflicts in neighbouring Isiolo district and failure to get support from relatives and institutions working in the area. Results in table 5.7 show that 60% of sampled respondents were affected by insecurity in the area e.g. cattle raids and robbery. They reported that their homes are occasionally raided off their livestock and household goods. Also in the lower areas of Mugae, insecurity incidentswere on the increase due to tribal conflicts between the *Tigania* and *Imenti* Meru people over the boundary/territorial conflicts. Technological risks were related to production constraints faced by farmers that included crop and animal diseases, pests, lack of inputs e.g. appropriate seeds, chemicals and weak extension services. 70% of household respondents sampled for the study reported they faced technological problems that had affected production levels. 81% the respondents also said that they are constantly exposed to famine and food security problems due to crop failure (table 5.7).

Human diseases were also reported to be prevalent in the area, especially malaria and nutritional related diseases. In table 5.7, it is shown that 22% of households perceived HIV/AIDS as a risk, indicating that the pandemic that had been declared a national disaster had not been perceived by the households as a major risk yet. 85% sampled respondents said diseases are a source of risk and cited poor or lack of medical services in the area for this, see table 5.7. They said reliable and affordable medical services at district hospitals were far off, with an average of 30 to 40 km to Isiolo and Meru towns respectively. Lack of financial resources was also cited as a source of risk by 65%(see table 5.7) of the households in terms of lack of money, employment opportunities and effects of poor pricing of their farm produce. In addition to the above risks, 28% households are affected by other risks like: lack of enough land for farming, lack of domestic water and large family to feed (table 5.7).

**Table 5. 7 The Risks Categories cited by sample households**

| *Risk source/Type* | *Frequency* | *Percentage* |
|---|---|---|
| Drought | 67 | 98.5 |
| Insecurity/Thefts/cattle Rustling | 41 | 60.3 |
| Human diseases | 58 | 85.3 |
| Technological risks | 53 | 77.9 |
| Financial risks | 44 | 65.2 |
| Famine | 55 | 80.9 |
| Other | 19 | 27.9 |
| (Sample size | 68) | |

Source: Survey Results, 2000.

## 6. Conclusion

It is important to take note of some aspects of this study when drawing policy inferences. In the first place, the study was carried out in an area with migrant settlers in a district generally considered high potential agriculturally. Hence the risk conditions may be different from those in districts that are classified as ASAL districts in Kenya. Secondly, the socio economic, cultural and physical environment of the study area is different from other areas in Kenya. In view of this, it may not be appropriate to generalise the results to all dryland communities in the country except for those in comparable conditions.

Based on the above perspectives and study findings, the following conclusions are feasible:

- Dryland rural households are not homogenous, they differ from one another due to different types and levels of asset entitlements; and
- All households perceived drought as the most important risk regardless of their entitlement status. Other risks included human disease, limited access to technological services; lack of financial resources and insecurity involving theft and cattle rustling. Others were lack of enough land for farming, lack of domestic water and large family to feed.



## 7. Recommendations

Since household food and income security are the major causes of poverty in dryland rural areas, there is need to ensure that development interventions do not increase the risks the household face. To improve the impact of external interventions, policies should aim at first appreciating resources owned by households and the perceived risks faced by the households with a view of identifying the most vulnerable groups in the area. In this way, the risks faced by the households will be appropriately addressed by having interventions incorporated into indigenous local coping mechanisms of different households. Consequently, sustainability of development interventions will be enhanced as the impact of projects will be nurtured after the project period ends.

It was indicated at the beginning of the study that poverty levels were high in the research area despite implementation of various development programmes in the area by the state, NGOs, FBOs and the private. In policy terms, this calls for partnerships in the implementation of development programmes. In broad terms, three principles are important for ASAL development i.e. Active involvement of the local people and their practices; Strengthening of local resources; and establishment of linkages between endogenous and exogenous resources (i.e. coherence).

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