

# Rural Community Coping Strategies with Drought-Driven Food Insecurity in Kwale County, Kenya

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**Abstract** This paper discusses how households in Kwale in Kenya cope with drought-driven food insecurity and also provides suggestions to inform sustainable mitigation planning. This area was purposively selected because it suffers the most severe food insecurity levels in Kwale County. The main respondents were 120 households selected using stratified random sampling and 20 key informants selected purposively. Primary data was collected using questionnaires, focus group discussions and environmental observation checklists. Since the goal was to determine general trends, data analysis focused on descriptive statistics. Findings indicated that major droughts tend to occur every 10-15 years while minor ones after every 3-4 years. Failure of staple food crops and livestock losses elicits severe negative impacts on the community's well-being. Further, technical mitigation measures perceived as effective were not necessarily the most popular with the community. For instance growing drought resistant crops was ranked first by 90% of the respondents, perception on its effectiveness placed it 4<sup>th</sup> rank in favour of water reservoirs, whose priority ranking was 7<sup>th</sup> by 25% of respondents. Similarly, diversification of income was prioritized by 71% of respondents, yet placed as second in effectiveness in favour of engaging in waged labour, whose priority ranking was 3<sup>rd</sup> by 58% of respondents. By implication, decision-making for lasting mitigation measures requires the input of farmers. In conclusion, short to medium term drought coping mechanisms should focus on diversifying food and income opportunities for households. As such farmers need to be empowered to access financial credit for investment. At the county level, investing in water resources development for irrigation agriculture and improvements in livestock management remain key long-term mitigation measures. The requisite community capacity building calls for coordinated public-private-civil society partnerships.

**Keywords:** household food security, drought, mitigation

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## 1. Introduction

### 1.1. Background

About 80% of Kenya's land mass is arid and semi arid, with limited and unreliable water supply as a key limiting factor in agricultural development [16]. Accordingly, community well-being is persistently at risk due to predictable crop failure and high herd mortality, and hence food insecurity and famine. To survive, communities in dry lands find themselves are in greater need of external support, which often robs them of their dignity. The consequences of drought are often as a result of many interacting factors such as poverty, high dependency on rain-fed agriculture, population increase, poor of natural resource management and inadequate economic development. It is also generally acknowledged that rural areas are more vulnerable to drought because the rural economy is tied to the agricultural sector, where climate change is a factor whose substitutability is very limited. The primary challenge in these regions is how to ensure

sustainable food security amidst the challenge of drought and others impacts of climate change [13]. Although generally marginalised in development planning due to the adverse conditions, research in India shows that some of the highest returns to investments in roads, electricity and education, as well as the greatest effects on poverty, occur in such areas rather than irrigated or more fertile areas [2].

Several attempts have been made by the government of Kenya to improve the livelihoods of people in arid and semi-arid lands. For example, in 1980, an ASAL section was set up in the Ministry of Economic Planning and Development. In 1989, this unit was replaced by a full Ministry of Reclamation and Development of Arid, Semi-Arid and Wastelands. This past focus was however biased towards cattle and conventional range management approaches in the easier to reach semi-arid districts. In 1996, the World Bank supported Arid Lands Resource Management Project to alleviate food insecurity through drought and Natural Resource Management. Kinango Sub-county, which is the focus in this paper falls within this region also classified as coastal lowland Agro-Ecological Zones CL3-CL6. Up to 60% of its population relies on food aid [6].

## 1.2. Problem Statement and Justification

Although Kwale County is a food insecurity area, the poverty and human deprivation remain even more persistent development challenges in Kinango, hence its choice as the study site. This scenario is widely attributed to crop failure and declining herd sizes due to a high frequency of droughts [9,14]. In Kenya, over 60% of the ASAL population lives below the poverty line [7]. This has increased vulnerability across a vast area of Kenya from the pastoral North to the Southern range lands, the marginal agricultural areas of Eastern Region and parts of Coast Region. It is also widely acknowledged that Poverty and insecure livelihoods force people to pursue natural resource management practices that are ultimately destructive of their long-term welfare, including their adaptive capacity and the resilience of the environment as a life-support system [1,8]. Sustainable management of food insecurity thus requires a new paradigm that focuses on the role of the state in a determined attack on poverty and hunger as a way of protecting the basic rights of people [5]. Since small-scale farmers in rural areas provide more than 70% of food in developing countries, focus in this paradigm shift should be on their needs and potential. Special attention should be given to rural semi-arid small holders that are persistently dealing with the indignity of drought-driven food insecurity.

Drought is considered by many to be the most complex but least understood of all natural disasters, affecting more

people than any other hazard because its effects (famine in particular) accumulate slowly over a considerable period of time and may linger for years after the termination of the event [3,18]. The degree to which a population is negatively affected by drought depends largely on its vulnerability and various response or coping options available to them. This paper discusses how households in Kinango cope with drought-driven famine and suggests some sustainable solutions thereto.

## 2. Methodology

This study was done in Makamini Location of Kinango Sub-county, Kenya (Figure 1). This area was chosen because of being over 60% food insecure, a situation that is directly linked to adverse climatic condition with persistent drought as the main driver. As a result most of the households depend on relief food and food for assets, which are inadequate and not sustainable [12]. The area has a population of 15,378 people with 1922 households [11]. It has an area of 707 km<sup>2</sup>. With an average cultivated farm size is 5 acres per household, pressure on land is increasing. The rainfall range though 400-700 mm per year is erratic and unreliable and hence the high risk of crop failure despite several adaptive strategies in place.

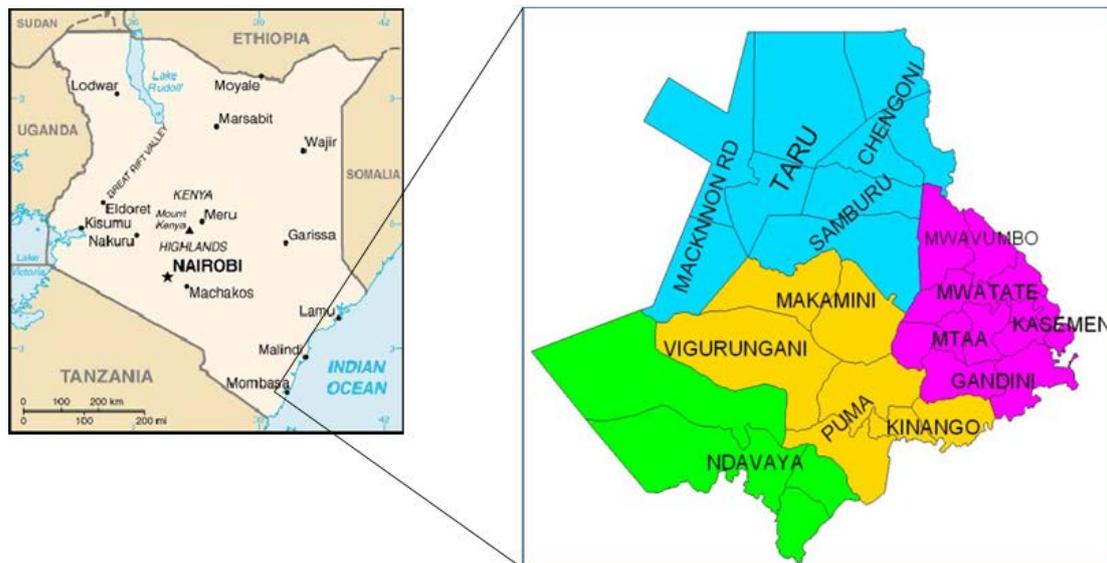


Figure 1. Location of Kinango Sub-county within Kenya (Not to Scale)

A cross-sectional survey design was used in this study. The rural poor, who are dependent on agricultural systems and natural resource base, constituted the target population while the unit of analysis was the household. The household head was the unit of observation. Purposive sampling was used to select Makamini Location because it has the highest percentage of people who are food insecure. A representative sample size of 120 households and 20 key respondents were used in this study. Data was collected using Focus Group Discussion, Field Observations, Household Survey Interview Schedule, and Questionnaire Survey. Standard procedures with focus on descriptive statistics were used in data analysis.

## 3. Results and Discussions

### 3.1. Frequency of Drought Events

Study findings revealed that the 1980-1984 drought event was associated with serious food shortages and forced the Kinango residents to travel as far as Msambweni, a distance of more than 70 km, to buy yellow maize flour to replace their staple white maize flour (Table 1). This famine was nicknamed 'Njaa ya Njenga' because people had to get the yellow maize flour from Njenga's shop at Msambweni. Inherent in this

humour is shortage of business skills among the local population. Its basic survival approach of focussing on staple foods only exacerbates vulnerability to contingencies like drought. The survival remedy during

the 1990-1993 drought was preparing “*chapati*” – a wheat product because the price of wheat then was low. Wheat is not grown in this semi-arid area. Affordability of “*chapati*” depended on households’ financial status.

**Table 1. People’s Perception on Worst Drought Events**

Drought Years	Description	Local Name of Famine
1980-1984	Trekking to Msambweni for yellow maize flour	<i>Njenga</i>
1990-1993	Wheat flour was at low price , maize flour was scarce	<i>Chapati</i>
2001-2005	High frequency of charcoal burning at high rate, Renovation of Kituu borehole.	<i>Katoto</i>
2006-2008	Three years of extreme drought, prolonged drought	-Not indicated

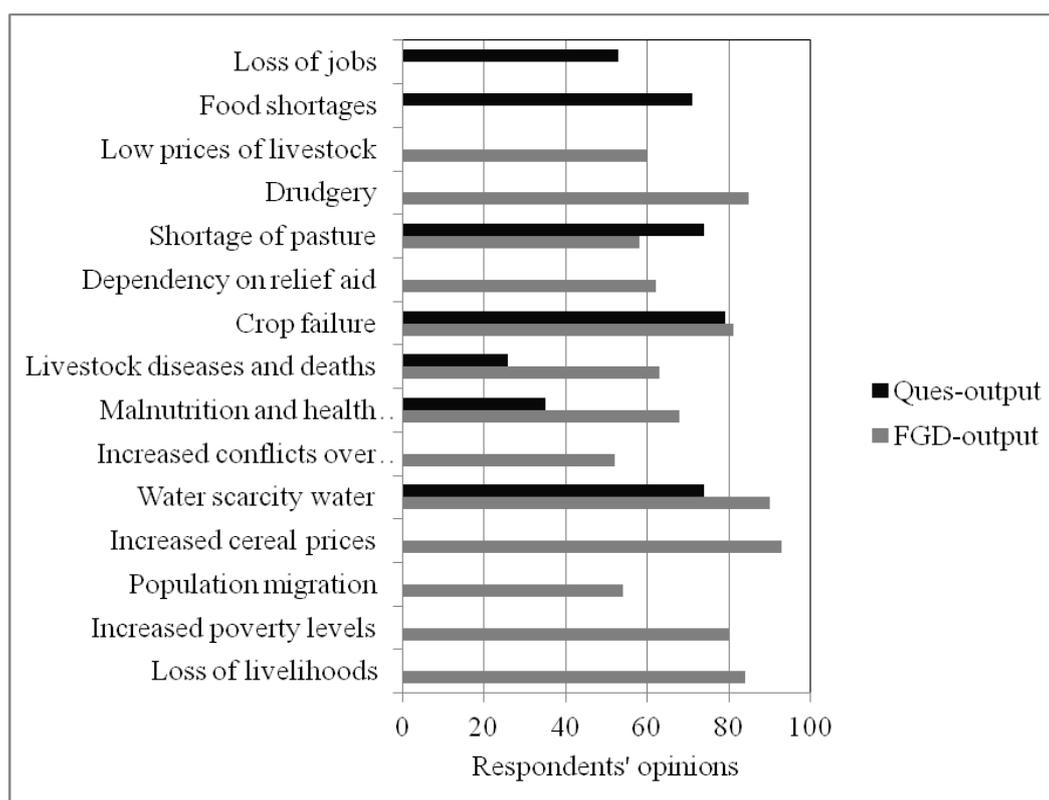
Source: Fieldwork July, 2010.

These findings agree with the results of Kenya’s National Policy on Disaster Management, which asserts that major droughts come after every ten to fifteen years and the minor ones after every three to four years. Waswa *et al* [17] observe that dryland ecosystems in Kenya should expect drought events of serious implication on livelihoods every 4-5 years. This notwithstanding, strategic plans to adapt and mitigate both scenarios have remained a mirage to policy and intervention stakeholders. From a planning perspective, contingency measures against minor and major drought events remain key initiatives in securing community livelihoods. Target

communities too need to see survival beyond their staple food and be willing to diversify production and feeding habits in line with climatic variability.

### 3.2. Effects of Droughts on Community Livelihoods

Up to 79% of respondents singled out crop failure as the worst immediate impact on people’s livelihoods. The importance of water in dryland agriculture is indicated by about 74% of the respondents who reported that water scarcity was a serious impact of drought (Figure 2).



**Figure 2.** Respondents’ perceived effects of drought (%)

The consequent reduced economic activity translated into shortage of jobs (especially casual labour, which most of the residents depended on) and hence reduced household incomes. Up to 35% of the respondents indicated that health problems particularly malnutrition of children and young adults was also a serious felt impact of drought.

Results from Focus Group Discussions (FGD) indicated that droughts have serious impacts on many key livelihood factors in Kinango Sub-county). Drought thus

translates into increased vulnerability of the resource poor households in Kinango Sub-county. This predicament requires urgent attention especially in the development of alternative, viable and sustainable food security strategies. Hiking prices of common foodstuffs eroded the communities’ purchasing power leading to poor health, increased school dropout rate and indirectly forced households to engage in environmentally destructive activities such as charcoal burning. Up to 68% of respondent indicated that drought pushed them to wanton

commercial charcoal burning. Although this resulted into quick cash to households, its impact on land quality through such consequences as land degradation and global warming cannot be over emphasised.

Loss of pasture and drying of water pans were key environmental effects of drought (Figure 3). As a consequence, farmers made long distances – as far as *Lungalunga* at the southern border with Tanzania. This caused livestock to waste away thereby reducing their survivability and economic returns. Communal conflicts over pasture and water resources were also reported by 56% of the respondents.

Focus Group Discussions revealed that inherent community responses to the multiple effects of drought also entrenched the vicious cycle of poverty. Further, drought consequences were exacerbated by several factors such as lack of clear drought occurrence warnings, lack of financial capital to invest in irrigation farming, insufficient knowledge and skills in drought resistant crops and livestock management, and low income levels, which limited households' ability to diversify their livelihoods away from rain-fed agriculture.

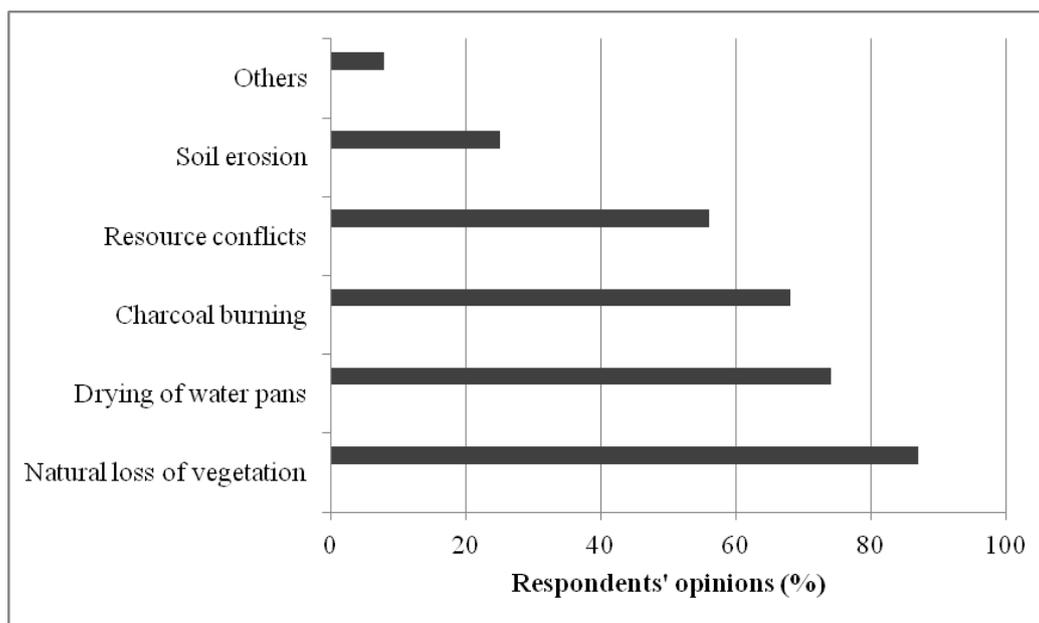


Figure 3. Respondents' perception of the effects of drought on the Environment

### 3.3. Drought and Food Insecurity Coping Mechanisms

Due to dependence on the staple food crops that are susceptible to failure due to drought, an immediate response to food shortages was reduction in meals consumed per day with most respondents indicated eating at least once in a day during drought periods (Figure 4). This leads to health problems particularly malnutrition among children. With strategic investment in micro-irrigation systems and strategic diversification of the wealth of crop varieties, which are naturally suitable in this area (Figure 5), much gain could be made in the fight against food insecurity.

In this paper coping strategies were classified into ex-ante and ex-post coping strategies. Ex-ante coping mechanisms are understood to be tactical adjustment designed to reduce losses during drought years. The primary goal of the ex-ante risk coping strategies is to smoothen income (i.e. ways in which households mitigate income shocks before they actually happen). This is often achieved by adopting conservative production choices and diversifying economic activities. Findings showed that 90% of the households interviewed grew drought resistant crops as a coping strategy to drought, while 89% of respondents indicated that finding a job was the best strategy in coping with drought. Up to 84% indicated diversification of income as critical in coping with drought while 76% used building up of livestock herds (Table 2).

Table 2. Ex-ante Drought Coping Strategies used by Households

Coping Strategy	% of H/h using the Strategy	Priority use ranking	Perception on effectiveness	Effectiveness ranking
Growing drought resistant crops	90	1	62	4
Finding a job	89	2	69	3
Diversification of assets & income sources	84	3	54	5
Building up livestock herds	76	4	51	6
Merry go rounds (Social networks)	45	5	32	7
Soil and Water conservation	36	6	74	2
Water reservoirs (pans)	25	7	85	1

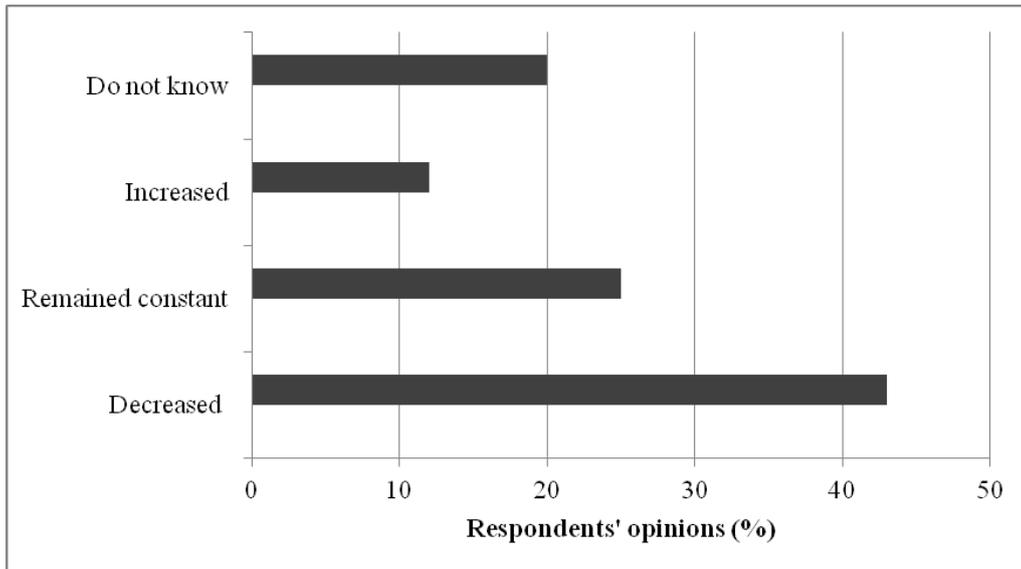


Figure 4. Food consumption patterns during drought events

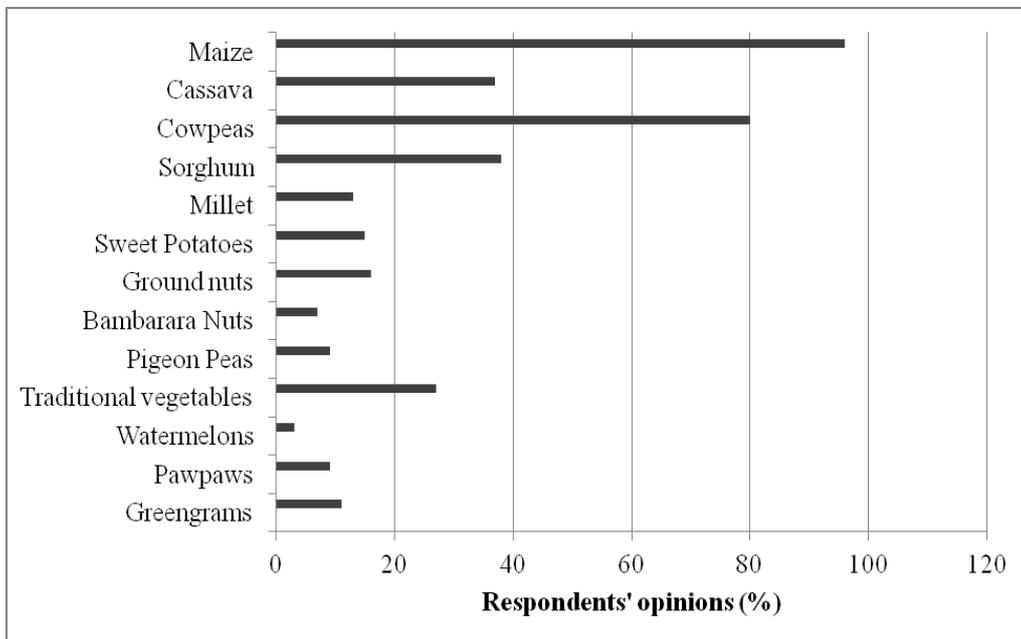


Figure 5. Crop varieties grown in Kinango

Construction of water reservoirs, construction of soil and water conservation structures for crop production, and “merry go rounds” (i.e. a defined group pulling financial resources for its individual members through a cyclic routine) were reported to be the least used ex-ante coping strategies by 25%, 36%, and 45% of the respondents respectively. Merry go-round was ranked the least in the priority rank of effectiveness by 32% of the respondents. This means that other ways of mobilizing resources among women may be more important. Although 85% of the respondents indicated excavation of water reservoirs/Pans as the most effective drought coping strategy, its priority ranking was the least at number 7, in favour of growing drought resistant crops, whose perceived effectiveness was ranked 4<sup>th</sup>.

Similarly although perceived effectiveness of soil and water conservation for crop production ranked second, its popularity among households was 6<sup>th</sup>. A similar pattern was observed for other coping strategies, which indicated that identifying workable entry points in drought

management in rural communities requires strategic partnerships between the households and those who seek to intervene on their behalf. Farmers are rational and their opinion in mitigation planning is critical for sustainable solutions. These findings are supported by Swift and Hamilton [15] and also Hussein and Nelson [4], who confirmed that during periods of drought crisis, households search for quick remedies like waged employment on the labour market which usually includes migration to urban centres. That most of the household interviewed were using less of the ex-ante coping strategies they perceived as the most effective in coping with drought should encourage stakeholders to build consensus with target communities on entry points that work and deliver immediate benefits then multiply their effects later. Kinango people avoided these strategies because of their high initial costs and labour requirements. In terms of the ex-post drought coping strategies (i.e. strategies also referred to as consumption-smoothing strategies as they help reduce fluctuations in consumption

even when income is fluctuating), about 70.8% of the respondents mentioned diversification of income as a critical coping strategy which they further ranked highest in priority of use (Table 3).

Up to 65% ranked selling of livestock as the second most important strategy in priority. These findings also agree with that of Paxson [10] who asserted that households often build up wealth to create a buffer in order to smoothen consumption after income shocks. At 54.2% popularity, charcoal burning was ranked 4<sup>th</sup> which is indicative of the high risk to environmental health. The least ranked coping strategy was withdrawal of children

from school, which implies that farmers still attach high value to schooling of their children and only withdraw them as a last resort (Table 3). That notwithstanding, the already existing low levels of education with more than 75% of the respondents having not gone beyond primary level could worsen the situation. Unlike ex ante practices, ex-post practices used by the Kinango people were the same as those which were identified by themselves as effective strategies to cope with drought. Most important ex-post drought coping strategies were diversification of income sources, sale of livestock, and engaging in waged labour.

**Table 3. Ex-post Drought Coping Strategies used by Households**

Coping Strategy	% of H/h using the Strategy	Priority use ranking	% perceived effectiveness	Effectiveness ranking
Diversification of income	70.8	1	65	2
Sale of livestock	65	2	48	4
Engaging in waged labour	57.5	3	71	1
Charcoal production	54.2	4	55	3
Reduction of consumption levels	45.2	5	27	7
Skipping Meals	37.5	6	25	8
Credits from friends and relatives	36	7	32	6
Migration	35	8	18	9
Remittances	25	9	45	5
Consumption of wild foods	9.2	10	12	10
Withdrawal of children from school	4.2	11	7	11

### 3.4. Mapping, Coping and Adaptation Partnerships

In the context of institutional dynamics, respondents identified Government, Non-Governmental Organisations, the Private Sector and Community-Based Organisations, which operate in the area as key partners in designing and implementing drought adaptation and mitigation measures

(Table 4). For sustained positive impact their involvement should be based on corporate social responsibility policies, which emphasise the effective involvement of the stakeholders in planning and implementation. To avoid wastage of resources and time, these agencies need also to collaborate among themselves and not compete for community and political limelight.

**Table 4. Mapping of Partnership Organizations**

Institution (Agency)	Potential drought adaptation support and intervention
World Vision	<ul style="list-style-type: none"> <li>Enhance construction of voluminous water pans to reach a level of one at a radius of 2 km.</li> <li>Support with small scale irrigation equipment</li> <li>Technical support on valuable crops &amp; value addition</li> <li>Trainings on marketing strategies.</li> </ul>
Roads	<ul style="list-style-type: none"> <li>Enhance accessibility of feeder roads</li> </ul>
ALRMP* in collaboration with Ministry of Agriculture & Livestock	<ul style="list-style-type: none"> <li>Support construction of water pans to a level of one for every 2 km radius.</li> <li>Enhance technical advice on water harvesting and conservation structures for crop production</li> <li>Trainings on Natural Resource Management and afforestation</li> <li>Technical advice on Livestock feed production</li> </ul>
Constituency Development Fund	<ul style="list-style-type: none"> <li>Enhance provision of bursary to reduce school drop outs</li> <li>Support small scale irrigation projects</li> <li>Support livestock feed production and livestock drought insurance</li> </ul>
Kenya Wildlife Services	<ul style="list-style-type: none"> <li>Construction of water pans</li> <li>Address wildlife/Human conflicts</li> <li>Compensate farmers for crop damage by wildlife</li> </ul>
Coast Water Service Board	<ul style="list-style-type: none"> <li>Construction of water pans at least at each 2 km radius.</li> <li>Support natural resource management (water, land and tree cover).</li> </ul>

\* Arid Lands Resource Management Project.

## 4. Conclusions and Recommendations

Diversification of income and assets, engaging in waged labour, charcoal burning, sale of livestock and relying on remittances are the most popular immediate mitigation measures against drought-driven food insecurity.

Construction of water reservoirs, soil and water conservation measures, diversification of income and assets, growing of drought resistant varieties, securing of good employment and building up of livestock herds stood out as particularly important in adapting to drought and food insecurity consequences. Accordingly, training for enhanced alternative livelihoods options and opportunities

is necessary. Included in this training should be more access to affordable rural credit facilities to help farmers solve their capital challenges, including diversification of livelihood options.

There is need to improve the productivity of the livestock sub-sector as it plays a significant role in the mitigation of food insecurity. This calls for the construction of high capacity water reservoirs, improved water supply points, launching of sustainable and effective forage development program, and regular trainings on how to improve marketing conditions for livestock, including government-driven insurance policies for the livestock. The failure to use ex-ante coping strategies that were perceived effective was attributed to the relatively high initial cost of investment and labour intensive undertakings. The indignity of drought is seen in the tendency of families to skip meals consumed per day. Resorting to charcoal burning was the immediate threat to the already fragile semi-arid ecosystem. The rather high frequency of drought in such an already poor community sustains the vicious cycle of poverty. Since food insecurity cannot be overcome by concentrating on the farm sector alone, integrated efforts involving multiple stakeholders are needed.

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