

TITLE: An Assessment of Vulnerability and Coping Mechanisms As Building Blocks for Development of Adaptation Strategies Among Kenyan Pastoralists. (*The Case of Nkaroni Community, Samburu County, Kenya*).

Authors: Rapando, Nancy Phoebe ¹, Kiragu Gibson Mwangi, Ngure Mary Wangui, Masafu Erick Wamalwa,

1: For correspondences Contact: Nairobi University PHD student, Email: rapandonancy3@gmail.com

Skype: nancy.rapando

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ABSTRACT

Pastoralism form the bulk of Kenya's agriculture dominated economy, yet the sector continues to face a variety of challenges that alienate pastoralism as a livelihood consequently affecting production. A recent analysis of rural communities in Arid and semi-arid lands (ASALS) of Kenya show that they do experience extreme climate change and variability effects that include prolonged droughts, increasing temperatures coupled with erratic rainfall. Recently, there have been significant efforts by scientists to provide appropriate solutions to climate change issues, adaptation being one of them. In principle, designing adaptations that can be part and parcel of sustainable development requires that we first take into account existing coping mechanisms and understand associated climate change vulnerabilities. However, there still exists a challenge particularly in Kenya as a result of lack of systematic and elaborate information on pastoral coping practices. This study was done in semi-arid Samburu of Rift Valley, Kenya, with the objective of assessing local pastoral livelihood coping practices and evaluating their contribution towards adaptation to climate change by subjecting them to a vulnerability analysis and future climate change predictions. Our research uses Participatory Rural appraisal methodologies to assess the local perceptions of communities on climate change impacts, coping practices and the effectiveness of the coping practices in a changing climate amidst other non- climatic challenges. The research considered agro-pastoralism and pastoralism practices, nomadic practices, privatization of grazing areas through ranches, pasture restoration practices among others. We find that although a number of practices are important as coping mechanisms to the effects of climate change, some of the land use systems could increase vulnerability of pastoralists by interfering with ecological and social integrity. We conclude the need for a comprehensive analysis to consider ecological as well as economic and social barriers to uptake of the practices. These findings constitute important information for decision makers and those developing adaptation plans, a key requirement of the developing countries by the UNFCCC (United Nations Framework Conference On Climate Change) process.

INTRODUCTION

The impacts of climate change including increasing global mean temperature and variations in rainfall are real and impacting ecosystems, biodiversity and human systems globally (IPCC, 2014). Substantial hazards from climate change are real and include disruptions of food production and water supplies, less incomes, destruction of homes and property, poor health and death (Opiyo et al., 2011). Although adaptation to climate change can reduce harm, challenges to

adaptation exist mainly in developing countries where low adaptive capacity and high poverty rates shape vulnerability (IPCC, 2014). Despite the continent's increasing efforts to support and implementation of climate adaptation at local, national and across sectors, most of it has been reactive and based on short-term motivations (Vermuelen *et al.*, 2008). Functional institutions, asset accessibility and peoples' ability to make informed decisions are key determinants of households' adaptive capacity to climate and other risks (Gupta, et al., 2008). Although a range of adaptation interventions for pastoral communities exist, a myriad of obstacles that include competing demands on natural resources, poor infrastructure, high poverty and poor governance could constrain people's efforts to adapt (Herrero *et al.* 2010).

The Kenyan ASAL(Arid and semi-arid lands) communities are however not spared from such, as they continue to experience extreme climate change and variability effects characterized by prolonged droughts, increasing temperatures coupled with erratic rainfall (Silvestri et al., 2012). This makes the majority of the pastoralists to risk declined food production, pasture and water availability effects that further impacts on food security and health among others (Opiyo et al., 2011, Ongoro and Ogara, 2011). We therefore argue that developing an adaptation strategy for such pastoral communities will require that the present coping strategies be used as a foundation while analyzing obstacles to increased resilience; this will also require that institutions be enlisted as key actors to facilitating community adaptation.

The aim of this study was therefore to assess existing coping strategies as building blocks to development of an adaptation strategy for the Nkaroni community in Wamba District. Where key questions that the research chose to answer included; what are the key climate and non-climatic vulnerabilities existing at Nkaroni? How can the existing coping strategies be strengthened to achieve sustainable adaptation? And What barriers and incentives could affect uptake of identified adaptation options?.

METHODOLOGY

Study area

The Nkaroni community, located in Wamba Sub County Samburu county that was selected as the study area is characterized by low moisture availability, lack of vegetation cover due to a low annual rainfall, high evapotranspiration rates, poor infrastructure that affects markets and mobility, low literacy levels and gender constructions (men, women, morans) that shape vulnerability to climate change effects.

The study used a combination of methods such as transect walks, focus group discussions and key informant interviews. Two focused groups disaggregated by gender were carried comprising of 12 men and 12 women of various ages. The FGDs utilized semi-structured questionnaire with an aim of identifying the community's perceptions to climate change and its impacts on their livelihoods. Observation was also used in understanding land, livestock, health food and water related vulnerabilities. Key informant interviews were also done with community leaders and local administration officers. The respondents gave a historical narrative of major climate events for the last 20 years that allowed an analysis of climate change related vulnerabilities and coping strategies. This was followed by a discussion on the future forecasts in the area and an analysis of each coping strategy if it can stand the changing climate and other vulnerabilities. The

practices that would still be applicable were passed as suitable long term adaptation options while the rest were to be used as risk management options to allow short term adaptation.

RESULTS AND DISCUSSION

This section has a key document; the adaptation strategy that outlines the key vulnerabilities, coping strategies and adaptation options. We chose to give a comprehensive discussion on 2 key vulnerabilities that include water and food which entails aspects of livestock that is a key livelihood aspect. However health that is not discussed in the summary has been explicitly discussed in the adaptation strategy.

Water

During the study it was evident that water was one of the scarce resources in the area, this was evidenced by the dry seasonal rivers and the dirty water that women were seen feeding their children on. A number of water related vulnerabilities mentioned included; Pasture inadequacy, flashfloods causing soil degradation, Water quality not assured, water from sand dam is dirty. The community did inform us that the 1997 and 1998 El Nino was the last time they had adequate rains and general water scarcity shown by that students have to carry bottled water to school that was not suitable for consumption (see photo alongside). The community however identified a number of coping practices while mentioning related vulnerabilities that included; migration of livestock by “Morans” that posed *food security challenge*, digging of wells by Men (*shared by livestock and humans potential conflict area*), women travel for long distances to seek for water using donkeys (*Exposed to wild animals, girls’ education affected*). Institutions/organizations seemed to be supplying water for households that had a water tank (*point of manipulation, might not benefit the most vulnerable*).



Although, the Kenya Vision 2030 aims to ensure that improved water and sanitation are available and accessible to all. Based on the policy of the Kenya Vision 2030 and Water Service Strategic Plan 2009 prepared by Ministry of Water and Irrigation, the targets for water supply development were set to Increase coverage of improved water supply to 100% for both urban

and rural areas, this sounded as a dream to the Nkaroni community. The study on consideration of a number of existing institutions, climate predictions for the area and existing challenges, a number of adaptation options were chosen as long term and others were proposed to be suitable for risk management as shown in the Table 1 below. The options included physical, social and institutional options that tended to put more responsibility on the community and the local government.

Table 1: Adaptation options under water

| Adaptation Options | | Barriers And Incentives ¹ | Institutions |
|---------------------------------|---|--|--|
| | WATER | | |
| Structural/ Physical | Building Individual And Communal Tanks. Improve Water Harvesting Techniques (Use Polythene, Use Gutters For Schools). | Barriers <ul style="list-style-type: none"> • Lack of policies • Coordination of climate change issues Incentives <ul style="list-style-type: none"> • External funding required by county government, and NGOS • Budgeting | National government County government NGOs Conservancies CDF NDMA, ACTED ENNDA Centre for Dry lands Research CETRAD, ICCA& CASELAP(UON), WARREC (JKUAT) |
| | <ul style="list-style-type: none"> • Construction of dams and wells and bore holes, water pans, rooftops, rock surfaces, Butamen (water harvesting from roads). • Treatment of water to be done at the distribution point. • Conservation of the catchment through planting grass and gabions to avoid runoffs. • Rehabilitation and protection of water catchment areas(Mathews And Kirisia) • Zoning within the conservancy to have preserved grazing areas that easily accessible. • Establishment Of Pastures | | |
| Social | Risk Management | | |
| | <ul style="list-style-type: none"> • Political will required on infrastructural development (develop a system for ensuring accountability of the administrative system. • Develop bye laws on the communal use of resources like sand dams and for watershed management. | | |
| Institutional | Risk Management: | | |
| | <ul style="list-style-type: none"> • Development of forecasts, dissemination and action. • Capacity development on use of NDMA systems. • Develop integrated water management plans • Forecasting systems for water shortages to develop short term storage system. • Capture water for livestock use. • Coordination of actors action on water management aspects . • Further study is therefore required, considering local specific hydrological and hydrogeological conditions in Samburu. | | |

¹ (resources in terms of budget), Institutional mechanisms in terms of organizations and policy support)

| Adaptation Options | | Barriers And Incentives ¹ | Institutions |
|--------------------|---|--------------------------------------|--------------|
| | • | | |

Food security, Health and Livestock.

Their main socioeconomic activity for the people of Nkaroni area is extensive livestock production with a traditional dependency on livestock for meat, milk and blood as a food source. During our discussion with the community, the community identified a number of vulnerabilities associated to this, which included; Overdependence on blood, meat and milk that are climate sensitive, the rising population and food sources reducing due to livestock diseases and migration of livestock causing starving, and the fact that livestock not easily being translated to food directly or through sales for food out of the cultural aspects. However amidst all this, the Nkaroni community had devised a number of coping practices that were also found to increase vulnerability as follows; Food distribution to schools (*insufficient, inadequate storage facilities, overdependence, manipulation tool*). Developed committees for food distribution (*lack of clear guidelines on food distribution to be given to the community, potential conflict area*). Sale of livestock (goats) for food (*faced by attacks by Morans, male decision making*). Changing diets among women and children (*consuming chicken, not eaten by all HH members*), women pool resources together for food buying (*limited by resource access*). In case of risks they pool resources from relatives. The developed adaptation options therefore call for the need for strong policies to be developed along enhancing the livelihoods of the people of Samburu. There is also increasing need for policy planning to include livestock off-take programs as part of value chain development in order to reduce livestock mortality and income loss during drought. However cultural aspects should be carefully considered because in addition to food security, economic, human health, and environmental roles, livestock serve crucial social and cultural roles. For example, in Africa, they define certain social relationships such as social status in relation to livestock size. Additionally, social relationships are created or strengthened with livestock as it is used in dowry or bride price, and allocations to relatives as loans as quoted by [Kitalyi et al. 2005](#).

| Adaptation Options | | Barriers And Incentives ² | Institutions |
|-----------------------------|---|--|---|
| FOOD | | | |
| Structural/ Physical | <ul style="list-style-type: none"> Develop household and communal food storage systems. Develop receiving systems (storage) and check for inefficiencies. Develop appropriate systems for utilization of food forecasts in collaboration with NDMA. Streamline abattoir systems and livestock offtake programs during drought period in tandem with projected drought forecasts | <p>Barriers</p> <p>Inaccessibility (road infrastructure) Human Wildlife conflicts Bureaucracy Capacity gaps among county executives Gender disparities in food decision making. Moranism hinders access to livestock during drought periods. Literacy levels</p> <p>Incentives</p> <p>County government to give incentives Fund conservancy plans and replicate conservancy efforts.</p> | <p>National government NDMA County government Conservancy World food program KARLO ILRI Centre for Drylands Research CETRAD, ICCA& CASELAP(UON), WARREC (JKUAT)</p> |
| Social | <ul style="list-style-type: none"> Diversification: diversify eating habits (attitude change) to poultry and other foods. Streamline communication between food distribution committees and the community on food distribution decision making. County to monitor efficient food procurement and distribution systems. Enhance citizen participation in development of laws, policies and interventions | | |
| Institutional | <ul style="list-style-type: none"> Develop agriculture programs to support livestock as a food source. Develop food for work program and link with construction systems Strengthen and continuously support food distribution committees. Strengthen resource pooling for buying food | | |
| Adaptation Options | | Barriers And Incentives ³ | Institutions |
| HEALTH | | | |
| Structural/ Physical | <ul style="list-style-type: none"> Incorporate herbal trees in tree planting as a preservation and conservation strategy. Develop strategies where food aid is sourced within the county. Develop food storage systems, like having cereal storage system in the area. County government to prioritize construction of health facilities. | <p>Barriers</p> <p>Retaining professionals due to insecurity Preference of their traditional systems</p> <p>Incentives</p> <ul style="list-style-type: none"> Free medical camps Beyond zero campaign to | <p>County government National Government Faith based organisations Caritas, AMURUT NDMA (National Disaster Management Authority) AMREF, ACTED Centre for Drylands Research CETRAD, ICCA& CASELAP(UON), WARREC (JKUAT)</p> |
| Social | <ul style="list-style-type: none"> Development of community health workers system who need to be capacity build so as to train the community on and aid in attitude change. | | |

² (resources in terms of budget), Institutional mechanisms in terms of organizations and policy support)

³ (resources in terms of budget), Institutional mechanisms in terms of organizations and policy support)

| Adaptation Options | | Barriers And Incentives ² | Institutions |
|-----------------------------|--|---|---|
| Institutional | <ul style="list-style-type: none"> • Work with KEMRI(Kenya Medical Research Institute) and have community health workers trained on formulation and diagnosis. • Research on use of some of the traditional systems. • Prioritize community trainings on food preparation of the distributed food. | prioritize Samburu | |
| Adaptation Options | | Barriers And Incentives | Institutions |
| LIVESTOCK | | | |
| Structural/ Physical | <ul style="list-style-type: none"> • Develop pasture establishment programs (like the grazing management programs in the conservancies. • Enhance livestock off take systems • Develop livestock market systems | Barriers Moranism Cultural attachment to livestock Incentives Develop livestock auctioning programs | ILRI KARLO Conservancies National Government County Government NDMA Kenya Meat Commission SNV Vision 2030 Secretariat |
| Social | <ul style="list-style-type: none"> • Encourage education and employment among moranism. | | |
| Institutional | <ul style="list-style-type: none"> • Training of livestock paraprofessional's e.g community animal health workers. • Strengthen programs that aim at keeping browsers like camels that can still aid the community in terms of drought and do not compete cattle on food. • Develop holistic management approaches in the conservancies | | |

RECCOMENDATIONS AND CONCLUSIONS

It is evident from the research work done that a number of coping practices exist that could support ASAL communities as adaptation options in the event of a changing climate and other related vulnerabilities. However, a number of barriers to uptake exist that includes; lack of policies, poor coordination of actors especially on climate change issues, poor infrastructure, human wildlife conflicts, culture that impacts a lot of gender disparities, making Moran's to be superior who at times interfere with infrastructure or take decisions on livestock movement without considering household needs and the low literacy levels among the peoples. However the county government system and the existing institutions supporting the community, if they are well capacity build on the climate change impacts and potential adaptation options is important if such communities have to remain resilient to climate change impacts.

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