

Institutional Impact on Pastoral Community Resilience to Drought in Kajiado County, Kenya

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Abstract: *The exponential disaster impacts reflect the low drought resilience of the pastoral community to drought. The study assessed the communities' resilience to drought. The study used the disaster resilience theory which borrows from the Karl Marx radical theory and the max weber Conservative Theory (Manyena, 2009) and the drought vulnerability conceptual framework. The study used quantitative and qualitative data collection. Qualitative content and thematic analysis, quantitative factor analysis. Results revealed climate change escalated negative impact on the biophysical environment, pastoralists' food insecurity and livelihoods. The development marginalized dryland communities. The study concluded pastoral livelihoods low drought resilience from worsening biophysical and climatic changes besides household destitution. All in all the inappropriate ex-post drought management approaches contributed the low pastoralist resilience to drought events. The study recommends understanding of indigenous knowledge contribution to drought resilience among pastoral communities, bridging the relief and development spheres divide, index based livestock insurance embedment and community empowerment in drought risk management processes.*

Keywords: Disaster, Drought, Resilience

1. Introduction

Disasters are the physical harm and social disruption which occur because the immediate event impacts exceeds normal protections overwhelm capabilities of the affected population. Disasters events are classified according to impacts, which caused more than 10 casualties, displacements or evacuation (Huho, Mashahara and Musyimi 2016).

Drought disasters account for only 5 per cent of the global disasters however it affects more than 1 billion people, which is equivalent to 25 per cent of the global population. About 41 per cent of the drought disasters were in Africa (Huho, Mashahara and Musyimi 2016). Drought disasters are the norm in the drylands and leads to the loss of about 2.8 per cent of the gross domestic product annually. Bogan (2014) and UNDP (2010) viewed catastrophic cyclic droughts would erode livelihoods to completely overwhelm community resilience.

The study adopts the UNISDR (2009) definition of resilience as the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structure and functions.

Hydro-meteorological responses to cushion the communities from the vagaries of weather are embedded within the large scale national responses to climate change. For example adaptive governance, ecosystem management and disaster risk management.

Drought famine relief had social, economic and environmental costs. Drought relief saved life. The recognition that ex-post drought management approaches were unsustainable in the long run, reinforces the underlying social and economic factors contributing to vulnerability and donor dependence (Williams, 2011).

The organizational capabilities to address financial, technical skills, leadership, human and policy resources complemented assets, ensure decision making offered competitive and sustainable advantage. Hilborn et al (2011) maintains that strengthening preparedness capacities and capabilities reduces actual drought interventions expenditure to obviate the need for emergency interventions. Kampragou et al., (2011) emphasized that operational response capabilities, strategic long-term disaster preparedness improved livelihoods support before, during and after disaster episodes. Habibi et al., (2011) Barton, Morton and Cary (2001) and Bogan (2014) supported that scaling up long-term concentrate feeds, fodder banks hay baling stockpiling to bridge forage scarcity would protect breeding stock.

Manei, MacOpiyo and Kironchi, (2014) viewed water, rangelands and biodiversity resources drought monitoring spatially and temporally defined quantitatively drought characteristics predictions, which improve emergency interventions and enable effective adaptation strategies. Curwen (2012) and Bond et al. (2008) emphasized that incorporating hydrological extremes into scientific and managerial approaches to manage and restore ecosystems ensures designed longer term management strategies adequately address drought impacts. Shahid and Behrawan, (2008) assumed that timely and effective assistance preparedness mechanisms required accurate risk assessment and hazard mapping. Save the children and Oxfam (2011) Indeed the only activities ongoing before drought event are early warning and food security monitoring and coordination mechanism slate responses drought responses abound.

Maghsoudi, et al (2013) stated that agricultural development services, practices and information access formed vital services that increased farming efficiency.

Strengthened livestock services, agricultural extension and rural development staff skills and knowledge improved

decision making on environmental uncertainty due to possible climatic change extremes. Hilborn et al (2011), Hilhorstand Jansen, (2010) denies that indigenous knowledge integrated in research training improves technological responses to complex, shifting socio-economies and ecologies of pastoral areas and promotes sustainable land use systems.

Shamano (2010) stated that disaster management practitioners, decision makers and at risk communities should take action to protect vulnerable people and environments against the volatile climate and environmental conditions in Gutu district in Masvingo province of Zimbabwe. Shamano, (2010) assumed that scaling up disaster risk reduction activities would significantly reduce the Gutu communities vulnerability to drought. Barney and Clarke, (2007) stated disaster risk management programmes, projects, investments and tactical and operational instruments and measures to reduce and mitigate risk would maximize societal benefits to protect people and economies. Mehta, Mendoza, and Rosenberg (2014) and Shokri, Hosseini and Mirdamadi (2010) corroborated that food for work vouchers, cash transfers protects against price volatility to address entitlement failures, social justice exclusion concerns, strengthen income - smoothing capacity. Herero et al., (2011) found that Index - based Livestock insurance provides low-income households payouts to allow restocking programs and to meet social obligations.

Shamano (2010) reviewed literature and used focus group discussions to determine implemented early warning. Kilimani, et al., (2015) used rigorous econometric analysis under different climate shocks scenarios to measure actual crop yields productivity losses related. Yinpeng, Wei, Meng, and Xiaodong, (2009) integrated historical crop yield and meteorological drought to measure the effects of drought disaster frequency, drought severity, production (yield) and extent of irrigation to establish drought risk index.

The research used the disaster resilience theory which borrows from the Karl Marx radical theory (Hewitt, 1993; Blaikie et al., 1994) development, disaster and post disaster (Kelly C. , 1996; Middleton and O'Keefe, 1998). The Max Weber Conservative Theory on cultural and institutional (Mileti, 2001; Gopalakrishnan and Okada, 2007).

The study uses the drought vulnerability conceptual framework where an entity is function of exposure to hazardous events, sensitivity and adaptive capacity (McCarthy, et al., 2001; Brooks, et al, 2005).

The study research question was what effect had institutional interventions contributed to pastoral communities' resilience to drought? The study objective was to assess the institutional impact on pastoral communities' resilience mechanisms to drought.

2. Methods and Methodology

The Cross Sectional Study

The cross – sectional study used the post positivist research paradigms allowed researchers to gain disaster management

practices insight from a constructivist perspective in the semi-arid county Kajiado County in the South eastern Kenya.

The transcribed data was sorted by type: primary respondents, key informants and group discussions. The transcribed data and field notes were coded to highlight changes and themes for factor analysis. The study triangulated quantitative and qualitative responses and the data findings for to improved reliability, validity, and convergence in the reporting or interpretation (Creswell and Piano - Clark, 2007).

Gender string variable food insecurity vulnerability duration, social networks and drought management institutional numeric variable coded factors for Statistical Package for Social Scientists (SPSS) software was used for Exploratory Factor analysis dimensionality reduction. Each factor was divided and summarized each original variable into common factor and one variable impact.

Thematic analysis determined precise relationships between concepts rich, detailed. Thematic analysis to unearth the salient themes, facilitated structuring and depicted themes that were summarized. Thematic analysis provided systematic analysis that allowed association with the whole content.

3. Results

Most pastoralist livelihoods reduced livestock per household from 200 to 50. Relief food distributed unconditional cash transfers, intervention is revealed from relatives 48%. Social capital networks present social protection, relief and credit strengthening opportunities from the friends 29%, milk trade and credit cooperatives 16%, and private moneylenders 7%. 18%, remittance from urban centers security personnel and other activities constitutes 5 %. Remittances are a form of restocking, and lastly, borrowing 2%.

Weather and climate information services on food security, diseases stresses and vegetation degradation monitoring to release timely forecasting data and knowledge for contingency action plans preparation, activation and mitigation actions influencing technical and economic interventions foster pastoral livelihoods.

Mobile phone devices are used to improve pasture and livestock market information surveillance. Agricultural, health, education and water trucking support operations activities in Rombo, Imaroro, Iloodokilani, Meto, Enkorika, Mbirikani and Oldonyo Nyekie.

Kenya Forest Service, Kenya Wildlife Service, National Environmental Management Authority (NEMA) and Water Resources Management Authority have drought risk reduction roles.

Early warning systems are developed with timely release of forecasting data and knowledge contribute to interventions preparation. World Meteorological Organization, Intergovernmental Panel Climate Change, IGAD Climate Prediction And Application Centre and nationally,

Department of resource surveys and remote sensing, Kenya meteorological department (KMD) and NDMA early warning systems.

The African Conservation Centre (ACC) and Namanga pasture re-seeding, drought refuges, livestock breed improvement, hay and fodder conservation banks bridges dry seasons forage scarcity. Supplementary feeds and concentrates were provided to pastoralists as institutional drought mitigation interventions.

Herd species composition diversification provided superior adaptation qualities, unique drought tolerance rebuild herd faster after drought, which enhances drought survival. Animal health preventative and curative services detection, diagnosis, permitting animal's movement, and quarantine to manage and control contagious disease spread.

Injiramat women group, Bissil, Mosiro's, Olturoto, Enkorika, Kuku, Olkiramatian, Imaroro, and Mbirikani capital credit access, and milk trade cooperative constitutes 16% of social networks. Livestock itinerary trader's form 7 % of social networks, which allows partial credit payments for credit extended during adverse drought events. Migrant populations depend on friends 29 % and indigenous populations depend on relatives 48 %. Social networks communalities 0.120, Eigen values 1.120, percentage variance 27.99 on the relatives, friends, cooperatives factors value of 0.294, -0.184 and 0.044 factor values respectively. Market education and information services, financial and investment services hindered disaster prevention and mitigation actions in Iloodokilani, OldonyoNyekie, Mosiro and Olkiramatian.

The presence of international and local drought management actors lessened community vulnerability to drought to medium in Rombo, Imaroro, Iloodokilani, Meto, Enkorika and Mbirikani. Few Non-Government Organizations operated in Olkiramatian and Mosiro made the areas high drought vulnerability areas.

4. Discussion

Drought worsens the invariably high rates of poverty because of economic losses. Drought frequency the increase and severity, expands restocking hardships limits drought recovery that increase the number of pastoralists leaving pastoral livelihoods (Osano et al., 2013). Climatic changes increases livelihoods exposure to drought which induces livestock asset decimation, damages and disruption (Edwards, 2015). Pastoralist destitution increased the rate of exposure to drought risk (Eriksen and Lind, 2009) and (Dougill, Fraser and Reed 2010). Extended drought duration prolongs chronic food insecurity (Kamuru et al., 2014). Frequent and intense drought recurrence induces immense natural resource base shrinkage that strongly influenced global desertification (Muhonda, 2011) and (Campos, 2015). Intensive land use that triggered altered flow regime was indicative of reduced natural capacity of aquatic ecosystems to cope with drought (Bond, Lake and Arthington, 2008).

Drought management involves obtaining hydrological, meteorological, and agricultural information to balance resource management social, economic and ecological priorities for disaster prevention, adaptation and mitigation. The technology investments, training and technical support regional cooperation over the years in the Horn of Africa has improved remarkably the quality of climate prediction (Baudoin and Wolde-Georgis, 2015). Technical early warning systems supports forage availability and natural resources management to optimize livestock production. The early warning systems observing networks, forecasting systems, telecommunications systems, data management systems, human resources core operational capacities built upon quality management systems principles to support product and services development provision.

Moreover, the early warning systems were integral part of drought planning ex-ante household vulnerability information for food stocks repositioning.

Factors that contribute to drought resilience are storing staple food and grain to buffer against seasonal shortages, saving, insurance, remittances and jewelry liquidation, horticultural, tourism and wildlife engagements, bee keeping, skin tanning, handicrafts, salt, medicinal plants, gum and resin production agricultural and livestock products processing, household employ destitute and flexible herders labor-sharing arrangements practises (Hunichi, 2012; Mphandeli, Nesamvoni and Maponya, 2015).

The role of social protection programs to restore entitlements, which aid most vulnerable groups gradual movement out of chronic poverty, improve human, physical and capital accumulation to promote riskier higher returns investments (Bass et al 2012; Brass 2012). Cash transfers social safety nets makes food markets functional in addition to compensating for the diminishing kinship links. social safety nets enables citizens to realize the right to adequate food, cushion livelihoods survival to manage drought impacts, mitigate disaster risks as well as prevent hazards from becoming disaster. The stocking of relief reserves reduces risks, minimizes vulnerabilities and avert unintended drought impacts (Matioli, 2015).

Zwaagstra, et al (2010) explained that providing low income households diesel subsidy to power boreholes was high impact drought interventions. Adger, et al., (2005) and O'Brien et al., (2007) showed emergency services provides immediate practical assistance, protects livelihoods entitlement from economic and ecological shocks.

Effective humanitarian assistance and disaster response saved lives, protected the more vulnerable groups through loans, relief food, seeds and fertilizers provision. Emergency preparedness and response reduced risks, minimized vulnerabilities, delayed and averted drought impacts (Matioli, 2015). There was a compelling need to reduce overall risk to insulate drought victims against drought effects to foster comprehensive food security (Adler, 2012). Conversely, drought emergencies management leads to unsustainable livelihoods, is economically inefficient, promotes risks to farming families, creates production,

market and trade related distortions in the wider society (Huho, Ngaia and Ongido 2010; Huho and Mugalavai 2010).

Afforestation and reforestation contribute to environmental sustainability ecosystem function springs flow and reservoir water levels, wetlands, wildlife and fish habitats, forage species generation, fuel wood and non-timber forest products biodiversity.

Monitoring drought stresses include markets, assets, rights and opportunities determinants of entitlements forms the basis for accounting for the underlying household welfare vulnerability dynamics for resource management, mitigations actions adaptation and drought risk reduction policy decisions (Bogan, 2014)

For instance, 75% of trainings were carried out before drought crisis periods (Zwaagstra et al 2010). Innovation relies on knowledge information systems contribution to food security and environmental protection. information technologies encompassing geographic, geologic, climatic, botanic scientific public information programmes technical and economic perspectives in an inclusive and consultative implementation of adaptation processes may contribute to resource management (Marshall, Gordon and Ash., 2009; Manei, MacOpiyo and Kironchi, 2014). Central disaster knowledge management repository system programme operationalization would improve information storage, retrieval and sharing. Agricultural extension technologies and information to build skills and capacities to ensure sustainable production practices to achieve food security would require the promotion of culturally relevant natural resource management (Muigua, 2014; Hiller, 2012). Indigenous knowledge allowed survival and renewal of culture, identity and societal wealth promotes culturally appropriate sustainable development, which informs livelihood outcomes with implications on disaster risk reduction and public goods management (Ibnouf, 2015; Kimani, et al., 2014; Enete, et al., 2014).

Early warning had the least focus on range and agro-pastoral systems. The environmental sustainability uncertainties and driving forces are consequently missed in the drought management practices which fail to appreciate the role of risk assessment (Karrou and El Mourrid, 2008). Baudoin and Wolde-Georgis, (2015) pointed out that early warning systems lacked implementations feedback loop between climate experts, policy makers and local communities representatives to products forecast users. Early warning systems negated vulnerability information when factoring coping mechanisms in response interventions. National agriculture and food security early warning systems had little linkage to water and meteorological. Moreover, Data collection was limited in density, data coverage to enable accurate climate prediction and analysis due to inadequate monitoring, lowly equipped and widespread hydro-meteorological monitoring infrastructure (Bogan, 2014; Hiller, 2012; Kampragou, et al 2011; Muhonda, 2011). Early warning systems had a poor track record of triggering early action. Late report assessments related to forecasts uncertainty information products adequate, accurate suitability hindered drought preparedness (Karrou and El Mourrid, 2008). Moreover, the dryland face significant data

availability and information challenges to support decision making. Research findings are inadequately translated to inform programme design and implementation.

Internal disturbance due to the rapid social system reorganization was accompanied with problems associated with linkages between external forces on social forces, between users and public information, public infrastructures and resources dynamics. Action plans triggered on issued early warning system technical and managerial level knowledge systems and products were the most effective strategies to mitigate the impacts of natural hazards (Ibnouf, 2015; Bogan, 2014; Trambauer, et al., 2015). There were no linkages of the national early warning systems at the community level. Sectoral famine early warning systems investments had timing limitations to support sustainability and self-reliance.

Matioli (2015) pointed out that the Kenya meteorological services countrywide networks provide early warning services spreads to virtually all communities. He asserted that liberalized local media into all dialects were able to disseminate early warning information.

Further, (Macmillan, 2011) stated that few water resources assessments were inappropriately developed and maintained that resulted in the insufficient water quantity and quality. In addition, water tankering was expensive, useful, low benefit impact intervention. Off-take program were inefficient and least cost effective. Animal health and veterinary services screening and certification were inefficiently implemented.

Nevertheless, Maghsoudi et al., (2013) pointed out that Non-Governmental Organizations and micro credit institutions services grants and projects funds offer collateral to access loans, credit, savings and insurance products. Subsidies, debt rescheduling, credit and insurance could be leveraged to support productive resources uses and drought recovery exigencies. Real assets and savings promotion, access to capital and financial flows were important for speed of recovery from hazardous situations were means of direct consumption to protect against trade and entitlement failure and resolve poverty challenges (Edwards, 2015). The weather based index contracts serves as contingent ex ante funding for pastoral enterprises continuity (Matioli, 2015). Insurance schemes pay offs manages disease outbreaks, price shocks and cattle mortality, which were associated with forage scarcity, low humidity and rainfall, high temperature and dry years (World Bank, 2012).

Drought management would have been more effective if information had been complemented with early resources and supplies prepositioning, relationships building to sustainably manage risks. Moreover, information instill fear element of hazard impact would result in corresponding behaviours where the population would take responsibility to manage risks was likely to improve drought resilience.

5. Conclusion

Drought impacts included reducing assets base, inducing land degradation amenable to institutional interventions of early warning information provision, declaration of disasters,

resource mobilization to either cushion affected populations or avoid the consequences.

Since drought is a slow onset disaster, policy oriented approaches that support early action were likely to reduce or prevent disaster losses. End user climate information usage was weak at the community level. Drought prevention activities were negated, which appeared to reduce resilience to future drought disasters. Therefore the dominant drought management intervention was drought response mechanism. Idiosyncratic risks have been tackled using public health, schooling, micro-finance and administrative service provision to improve income earning capacity, human capital condition and resolve poverty challenges has been lower than the national average. Dry lands have generally been marginalized in the development process. Consequently, livelihoods face increased susceptibility to drought.

6. Recommendations

Disaster policy framework should emphasize drought risk reduction activities that put the community in the center of managing drought risk.

Agricultural research and extension technologies information and knowledge should be used to contribute to sustainable production practice.

Indigenous knowledge integrated to scientific information would promote sustainable land use and improve shocks and stresses responses.

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