Konrad Adenauer Stiftung

Strengthening the concept of Early Warning and Early Action for Disaster Risk Reduction and Food Security:

Practices, Methods and Lessons from Baringo and West Pokot Counties of Kenya

University of Nairobi

AFRICAN DRYLANDS INSTITUTE FOR SUSTAINABILITY

Recommended citation:

Konrad-Adenauer-Stiftungand University of Nairobi, African Drylands Institute for Sustainability (2016).Strengthening the concept of Early Warning for Disaster Risk Reduction and Food Security: Practices and Lessons from Baringo and West Pokot Counties of Kenya.

Publication of the Konrad-Adenauer-Stiftung and the University of Nairobi - African Drylands Institute for Sustainability

1st Thigiri Hilltop/off Thigiri Ridge Road
P.O. Box 66471 - 00800
Nairobi/Kenya
Or Email to: info.nairobi@kas.de

Report compiled and reviewed by: Dr. Pauline Gitonga, and Prof. Felix Ngunzo Kioli

ISBN:

Cover photo credit:

Disclaimer

The information and opinions expressed in this publication do not necessarily reflect the views of KAS or UoN-ADIS. The report is a compilation of inputs from different stakeholders and therefore effort has been made to safeguard the highest editorial standard(s). However, KAS and UoN-ADIS highly regret for any typographical or grammatical error(s) that you may still encounter in the report.

TABLE OF CONTENTS

FOREWORD

The Konrad-Adenauer-Stiftunge.V, (KAS) has been in operation in Kenya since 1974. As a German political foundation established in 1955, our mission is to promote the tenets of democracy and citizen engagement in politics and society. It's based on our aim to engage citizens in politics and society that KAS is currently implementing the "Crisis prevention through the promotion of good governance in the area of food security in Northern Kenya". This project is funded by the German Ministry of Economic Cooperation and Development under the One World No Hunger Initiative. The project is currently being implemented in Baringo and West Pokot Counties to strengthen the relevant capacities and existing public policy platforms by the government institutions in the two counties and at the national level, political parties, the local media, the civil society organizations as well as the political parties within and outside the county and national assemblies on issues of food security.

Drought and other natural and man-made disasters are cyclical and endemic features of arid and semi-arid lands (ASALs) of Kenya. In the past, international organizations focused their humanitarian efforts in Northern Kenya regions of Wajir, Mandera, Turkana and Marsabit which were the most affected by such cyclical disasters. However, with the increasing climatic variability, regions further south of the Northern Kenya, counties such as Baringo and West Pokot are now increasingly becoming vulnerable to disasters such as, drought and resource-based conflict among others. This comes at a time when climate change experts predict that drought episodes are likely to have a shorter cyclical occurrence of between three and five years moving from the historical ten years cycle in the East Africa's ASAL areas.

Given this context, KAS is positioning its operation in Northern Kenya so as to continue to address with other partners, the policy and political needs of the local communities. In this regard and in the spirit of the project, KAS has commissioned two studies in the recent past: one study was to map out and analyse issues relating to policy frameworks, institutions and other actors in respect to food security and the other study was to analyse existing early warning systems (EWS) in respect to disasters in Baringo and West Pokot Counties of Kenya. It's equally based on the need to complementarily strengthen the findings of the later (EWS), that KAS released a Call for Discussion Papers in collaboration with the African Dryland Institute for Sustainability (ADIS). The different papers herein are therefore a culmination of KAS's efforts to generate and refine existing knowledge, learn, share with other partners and use the knowledge and best practices gathered to generally improve on future interventions in the area of food security.

Dr. Jan Cernicky
Country Representative, Kenya
Konrad-Adenauer-Stiftung

ACKNOWLEDGMENT

On behalf of Konrad Adenauer Stiftung (KAS) Kenya, We the editorial team composed of Prof. Felix Kioli and Dr. Pauline Gitonga would like to extend our deepest gratitude to all the authors of the papers published here. Your dedication and perseverance to meet the set deadlines enabled the timely publication of your papers. Sincere appreciation is also extended to the University of Nairobi's Prof. Jesse Njoka, the Director of the African Drylands Institute for Sustainability, Mr. Reuben Waswa from African Women's Studies Centre and Ms. Irene Mwende, Mr.JannesSamua, Mr. Denis Kongere and Ms. Mercy Nkathafor their initial technical and editorial review of papers during the one day national level seminar jointly organised by KAS and UoN-ADIS and held on 23rd November 2016 as well as in the previous county level seminars held in Baringo and West Pokot Counties.

We are also thankful for KAS' partners in in the two counties, led by I Serve Kenya working in Baringo County and Pokot Rural Development Project and Kenya Livestock Marketing Council both working in West Pokot who assisted in coordinating the county seminars within the month of November 2016. We cannot forget to also appreciate all the participants who attended and made valuable contributions during the county and national level seminars. Furthermore, we acknowledge KAS for organising the one day early warning systems expert discussion meeting held on 7th December 2016 that sought to seek views from partners under the NDMA's Ending Drought Emergency (EDE),Common Programme Framework, PillarNo. 5 -Drought Risk Management. The expert meeting allowed the editorial team to draw valuable insights from participants and ensured that ideas presented in the different papers were put into the context of the respective EDE pillar. Last and not least we express our heartfelt appreciation to the KAS, Kenya, led by the Country Representative, Dr. Jan Cernicky,the Project Coordinator for Food Security Project, Mr. Edwin AdogaOttichilo and the entire KAS Kenya staff notably, Inez Odongo and Susan Muriungi for the support accorded to us as we undertook this editorial assignment.

To all of you, we say thank you!

GLOSSARY

Acceptable risk
The level of potential losses that a society or community considers acceptable given existing social, economic, political, cultural, technical and environmental conditions.

Adaptation
The adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

Alert
A notification category between "advisory" and "activation" that provides urgent information and indicates that action may be necessary.

Capacity
The combination of all the strengths, attributes and resources available within a community, society or organization that can be used to achieve agreed goals.

Capacity building
The process by which people, organizations and society systematically stimulate and develop their capacities over time to achieve social and economic goals, including improvement of knowledge, skills, systems, and institutions.

Climate change
A change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcing, or to persistent anthropogenic changes in the composition of the atmosphere or in land use (Inter-governmental Panel on Climate Change (IPCC).

Contingency planning
A management process that analyses specific potential events or emerging situations that might threaten society or the environment and establishes arrangements in advance to enable timely, effective and appropriate responses to such events and situations.

Coping capacity
The ability of people, organizations and systems, using available skills and resources, to face and manage adverse conditions, emergencies or disasters.

Disaster
A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.

Disaster risk management
The systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.

Disaster risk reduction (DRR)
A systematic approach to identifying, assessing and reducing the risks of disaster. It aims to reduce socio-economic vulnerabilities to disaster as well as dealing with the environmental and other hazards that trigger them.

Early Action
Processes of consultation, policy making, planning and action to reduce or avoid disasters or hazards. Term usually used in conjunction with early warning.

Early Warning System (EWS)
The systematic collection and analysis of information coming from areas of crises for the purpose of: a) anticipating the escalation of violent conflict; b) the development of strategic responses to these crises; and c) the presentation of options to critical actors for the purposes of decision-making. The set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organizations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss.

Forecast
Definite statement or statistical estimate of the likely occurrence of a future event or conditions for a specific area.

Hazard
A potentially damaging physical event, human activity or phenomenon with a potential to cause loss of life or injury, property damage, social and economic disruption, environmental degradation amongst other effects.

Impacts
Specific effects of hazards or disasters also referred to as consequences or outcomes.

Mitigation
Short and long-term actions, programmers or policies implemented in advance of a natural hazard or in its early stages, to reduce the degree of risk to the people, property, and productivity capacity.

Preparedness
The knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions.

Resilience
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 structures and functions.

Response
Actions taken immediately before, during or directly after a disaster to reduce impacts and improve recovery from disaster effects.

Risk
The probability of harmful consequences or loss resulting from the interaction between natural hazards and vulnerable conditions of property and people.

Risk assessment
A methodology to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods and the environment on which they depend.

Risk management
The systematic approach and practice of managing uncertainty to minimize potential harm and loss.

Sustainable development
Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Vulnerability
Vulnerability refers to a set of conditions resulting from physical, social, economic and environmental factors which increase the susceptibility of a community to the impact of disasters.

ACRONYMS

ASALS	Arid and Semi-arid Lands
ASDSP	Agricultural Sector Development Support Programme
DRR	Disaster Risk Reduction
EWS	Early Warning Systems
IGAD	Intergovernmental Authority on Development
IKS	Indigenous Knowledge Systems
KAS	Konrad Adenauer Stiftung
KMD	Kenya Meteorological Department
NDMA	National Drought Management Authority
NDMU	National Disaster Management Unit
UoN-ADIS	University of Nairobi- African Drylands Institute for Sustainability

INTRODUCTION

Konrad-Adenauer-Stiftung (KAS), Kenya is implementing the project dubbed "Crisis prevention through promotion of good governance in the area of food security" in Baringo and West Pokot Counties of Kenya. The overall objective of the project is to promote household and community food security and livelihood resilience through interventions that promote good governance and household incomes for Baringo and West Pokot communities. In 2015, KAS Kenya commissioned the food security stakeholder mapping study that extensively identified and outlined functions of existing policies and institutions charged with ensuring food security in Baringo and West Pokot counties of Kenya . Findings of the study indicated that the two target counties were generally food insecure with the existing strategies applied by state and non-state actors being fairly effective, efficient and sustainable in averting food insecurity and disasters such as drought. The mapping study also noted that response actions aimed at averting food insecurity in both counties were pegged on early warning information received from several sources. These early warning systems were not integrated or clearly defined. To address this challenge, KAS Kenya in April 2016, carried out a baseline study through Chatham House based in the United Kingdom. The Chatham study entitled 'Early Warning Systems in Kenya: Linking development and drought resilience planning' evaluated the existing early warning policies and institutions at the national and at Baringo and West Pokot Counties level.

The study sought to contextualise if early warning policies and institutions had aligned with the IGAD Drought Disaster Resilience and Sustainability Initiative (IDDRSI) framework. IDDRSI is a 15-year initiative (2012-2027) that focuses on arid and semi-arid lands (ASALs). All IGAD member states are expected to align their national drought management policies to revolve around the seven IDDRSI proposed areas of interventions that are based on a systems approach. The system approach focuses on delivering developmental outcomes in drought prone regions with the objective of strengthening resilience and livelihoods and integrating early warning mechanisms and contingency planning into the development planning process. The Chatham study found that National Drought Management Authority (NDMA) was a key institution charged with ending drought emergencies in Kenya. NDMA through its Ending Drought Emergencies (EDE) programme had integrated early warning mechanisms and contingency planning into drought management policies and institutions at national and county levels. The report recommended that KAS Kenya's engagement on food security and early warning in Baringo and West Pokot be through the ASAL Stakeholders Forum (ASF). The ASF is a platform for civil society organizations that have a similar mandates as KAS Kenya current work of preventing crisis through promotion of good governance in the area of food security and early warning systems.

The ASF is emerging as an important platform that can be used to lobby for accountable spending, and focused allocation of resources to drought risk

reduction spending. ASF can also be used by civil society organizations to inform citizens about the different projects the County governments is intending to fund so as to reduce drought risk. This civic education will allow citizens to hold their Member of County Assembly (MCA) accountable. This will in turn prevent MCA's current haphazard reallocation of DRR resources. In addition, the ASF platform can be used to capacity build MCA's on DRR legislation design and proper resource allocations and accountability. In general, the report recommended that Baringo and West Pokot county assemblies mainstream the NDMA's EDE framework into the next county integrated plans (CIDPs) of 2017-2021. The Chatham study brought to light early warning policy and practice gaps that needed to be understood. Given this new dimensions KAS Kenya put out a call for discussion papers under the theme: 'Strengthening the concept of Early Warning, Early Action in the area of food security; in preparation to resume course content for state and non-state actors'.

The main aim of this call was to complement the initial study by Chatham House by generating and refining EWS knowledge. The call targeted all national and county stakeholders working on early warning mechanisms that address food security in Baringo and West Pokot Counties. The call response was remarkable and produced seven (7) key discussion papers that were presented in seminars held at the Specific County and at National level. The national level seminar was a one day workshop that was jointly organised with the University of Nairobi's African Drylands Institute for Sustainability (UoN-ADIS). Drawing from its rich pool of expertise, UoN-ADIS was able to offer presenters technical and editorial guidance. Both County and National seminars provided a platform for the paper presenters drawn from community, state and non-state actors to share their experiences and best practices on EWS mechanisms that address food security and disaster reduction.

This publication dubbed 'Strengthening the concept of Early Warning for Disaster Risk Reduction and Food Security: Practices and Lessons from Baringo and West Pokot Counties of Kenya' is a summary of the seven discussion papers generated from the call. The publication begins by setting the geographical and social cultural context of Baringo and West Pokot counties. The 7 discussion papers are then presented under the following two thematic headings: Theme 1: Indigenous Early Warning Systems and Practices and Theme 2: Lessons in Disaster Risk Reduction and Early Warning.

The publication concludes with a general conclusion and recommendations section. This section amalgamates the early warning and disaster risk reduction ideologies presented in the papers. This section also offers course correction recommendations for state and non-state actors by outlining a summary of practices and lessons that have promoted good governance in managing disasters and ensuring food security in Baringo and West Pokot Counties.

Setting the context for West Pokot County

West Pokot is classified as a semi-arid county that borders the Republic of Uganda to the West and the following counties: Trans-Nzoia to the South, ElgeyoMarakwet and Baringo to the South East, and Turkana to the North and North East. The county

lies within Longitudes 340 47’ and 350 49’ East and Latitude 10 and 20 North and covers an area of approximately 9,169 kilometres squared (Km2). The County is administratively divided into 4 sub counties namely West Pokot, Pokot North, Pokot Central and Pokot South, Kapenguria town is the county’s headquarters.

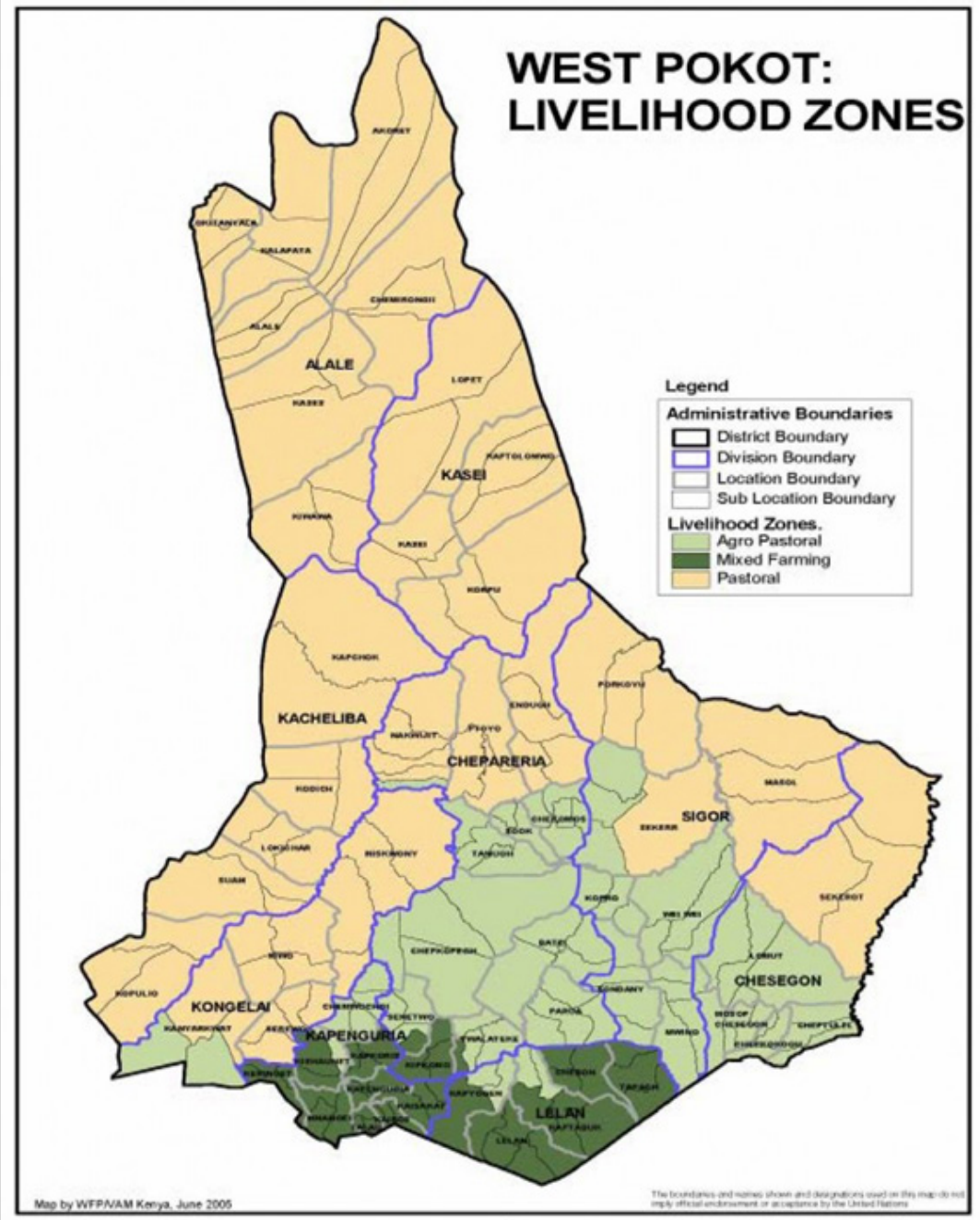

Figure 1: Map of West Pokot County Showing the geographical location of the livelihood zones

The terrain of West Pokot is rugged, the major topographic features include hills, dry plains and escarpments. This features range in altitude from 900 metres (m) above sea level for the plains of Turkana located in the North-east part of the county to over 3000 m above sea level for Cherengani Hills found in the South-eastern parts of the county. Rainfall is bimodal with the long rains falling between March and June and short rains between Septembers and November. The rainfall amounts range from 700 millimetres (mms) in the lowlands to 1600 mms in the high attitude areas around Cherengani hills. Temperatures in the lowlands range from15 to 30 degrees centigrade (0C) with highlands sometimes experiencing temperatures as low as 90C. The major drainage systems in the district are Turkwel, Kerio and Nzoia Rivers. Both the Turkwel and Kerio Rivers drain northwards into Lake Turkana while Nzoia River drains into the Lake Victoria in the south.

The county has a human population of 512,690 persons, with the male and female population of 49.7 and 50.3 percent (%) respectively. The population growth rate stands at 3.1 % per annum. The county has a total of 93,777 Households (HH) according to the 2009 population census and a population density of 56 people per Km2 approximately 69% of the population lives below the poverty line. The County is home to mainly the Pokot community. The total arable land is estimated to be 3,735 Km2 with non-arable land estimated to be 5,433 Km2. Most households in the county live in either clustered urban or dispersed settlements. Majority of the population resides in rural areas and predominately depends on pastoralism as their main source of livelihood. Subsistence crop production is also undertaken in the arable areas. Most land in the county is communal with only land in West Pokot and Pokot central sub-counties having title deeds.

The main disasters facing West Pokot Communities include cyclical conflict over dwindling natural resources, increasing drought episodes, frequent outbreaks of livestock diseases, lightning strikes, floods and landslides. Early warning and disaster risk reduction policies and plans in West Pokot are in place and guided by the NDMA EDE framework. The county has a disaster management bill that was adopted in 2015. This has raised the potential for more coordinated efforts between EWS and planning. The capacity for managing EWS information and contingency planning, as well as mainstreaming NDMA EDE framework within the new CIDP (2017-2021) seems to be on track in West Pokot county. In terms of DRR contingency planning, West Pokot had been able to adopt response plans at the county, sub-county and ward levels. However, these plans are still funded and coordinated under the NDMA drought EWS process .

Setting the context for Baringo County[5]

Baringo is classified as an ASAL county located in the North Western part of Kenya. The county lies between longitude 35o 30’ and 36o 30’ East and between latitude 0o 10’ South and 1o 40’ North. The county altitude varies from 700 m in the lowlands to 3,000m in the highlands. It borders the counties of Nakuru to the South, Kericho and UasinGishu to the South West, ElgeyoMarakwet to the West, West Pokot to the North West, Turkana to the North and North East, Samburu and Laikipia to the East. The county covers an area of 11,015.3 sq. km of which 165 sq. km is covered by

surface water. The county is administratively divided into six sub-counties namely: Mogotio, Koibatek, Marigat, Baringo Central, Baringo North and East Pokot. Based on the 2009 housing census the county has a population of 555,561 persons, consisting of 279,081 males and 276,480 females. The inter-censal growth rate is 3.3 % per annum. The population density is influenced by the climatic conditions, topography, soil composition, infrastructure development and land ownership. The average population density was projected in 2009 to reach 60 persons per square kilometre by 2017. The county poverty index stands at 52.2%.

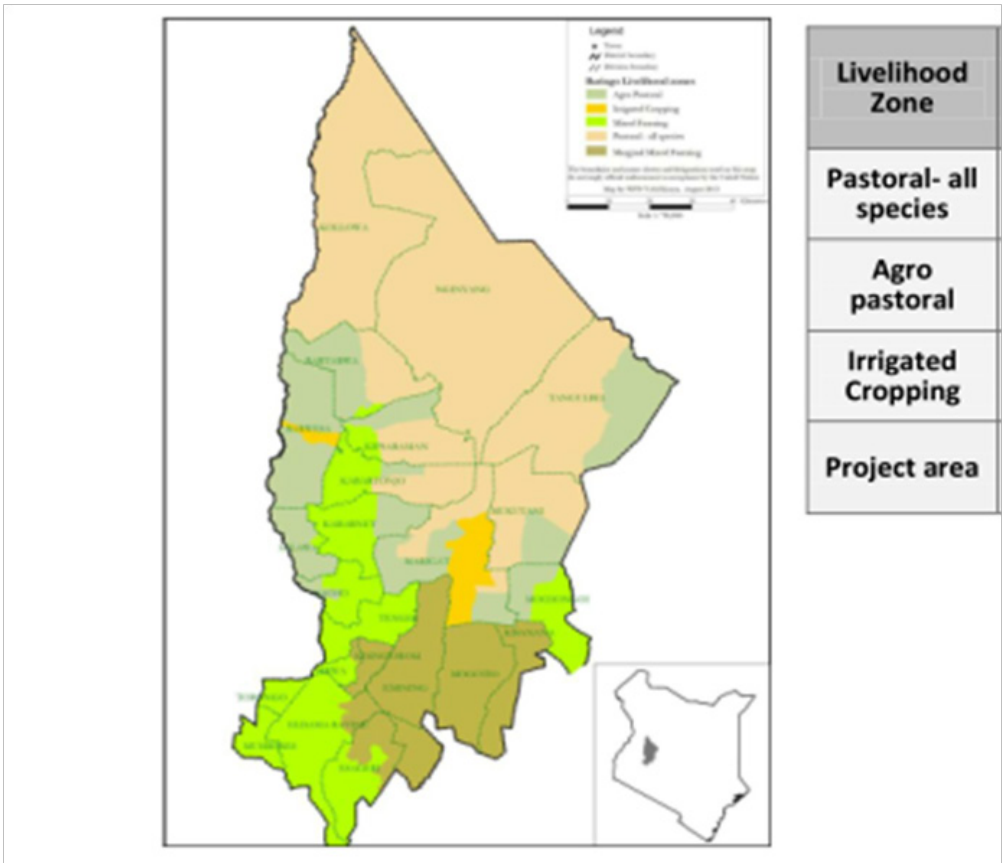

Figure 2: Map showing the geographical location of Baringo County and associated livelihood zones

The pastoral and agro-pastoral livelihood zones account for more than 50% of the county land mass, mainly covering the arid and semi-arid lowland zones and hosts majority of the county's livestock herd. The climatic conditions in the county varies from high rainfall zones in the highlands that receive 1000 to 1500 mm while the ASAL lowlands receive 600 mm of rainfall per annum. Temperatures range from 10o C in the highlands to 35o C in the lowlands. The livelihood strategies adopted by communities in the county include pastoralism in the drier lowlands areas, agro-pastoralism in the lowlands and mixed farming in the highlands. There are also pockets of irrigated

agriculture in irrigation schemes. Most of the county residents have adopted a sedentary settlement way of life. Owing to high levels of poverty coupled with increased population and high levels of illiteracy, the population has exploited both natural and agro-ecosystems hence enhancing their vulnerability to natural disasters. The county experiences prolonged dry spells or droughts mostly in sub-counties of East Pokot, Baringo South and Baringo North. Flooding and landslides are a common natural disaster in Baringo. Flood prone areas include Kerio Valley plains (Barwessa, Likwon, Chemoso, Kipkolon, Kakwame, Kaptara, Chebugon and Salawa) and Marigat/Ilchamus ward especially Endao, Sabalani, Ngamno, Longewani, Sokotei, Kiserian, KampiyaSamaki and Laruk. Other factors that are increasing the flooding incidences include severe erosion of Kerio valley plains, Endao River and the adjacent seasonal streams in Baringo South.

On the other hand, landslides are common in areas such as Tenges, tuluongoi, Kibonjos, sacho, parts of machongoi, Ngingin, Kapkasum, Ngelecha and Tandar. Landslides phenomena are being enhanced by human cultivation activities on the edges of cliffs and hills exposing the ecosystem to environmental degradation. Early warning and disaster risk reduction policies and plans in Baringo are in place and are guided by the NDMA EDE framework. The county has developed the Baringo County draft hazard atlas which will have the potential to guide more coordinated efforts between EWS and planning. The capacity for managing EWS information and contingency planning, as well as for mainstreaming the EDE framework within the new CIDP (2017-2021) seems to be on track in Baringo county. In terms of DRR contingency planning, Baringo has been able to adopt response plans at the county, sub-county and ward levels. However, these plans are still funded and coordinated under the NDMA's drought EWS process .

Theme 1: Indigenous early warning systems and practices

Indigenous early warning conflict indicators amongst West Pokot Communities of Kenya.

Joseph Tame Lolemtum

Resource-based conflicts among pastoralist in East Africa is a common man-made disaster that affects millions of people. West Pokot conflicts have resulted in displacement of people, loss of lives and livelihoods and has contributed to the persistent inter-ethnic hostility amongst the Pokot and Turkana communities. Conflicts amongst North Rift pastoral communities are partly to blame for the slow rate of social and economic development in these areas. This discussion paper focused on identification of indigenous early warning knowledge systems and institutions that can be used in conflict resolution amongst West Pokot Communities of Kenya. The paper findings were based on a purposive study that used qualitative research methods to gather data from key informant interviews (KIIs) and focus group discussions (FGDs) where respondents were selected on the basis of prior indigenous knowledge (IK) on conflict early warning indicators. The KIIs and FGDs data was verified using secondary scientific and grey literature documents and reports. The study finding indicate that the Pokot community were able to prevent most of the resource-based conflicts by use of their unique indigenous early warning indicators for instance, certain birds making unusual noises and cows drinking water while kneeling and pushing their tongues outwards and facing upwards. These indicators were verified with investigative observatory evidence such as presence of suspicious shoe footprints from neighbouring warring communities and unusual movement of neighbouring community's livestock. Once intelligence information was ascertained it was relayed back to the community to take necessary pre-emptive and preventive measures such as deploying warriors at strategic places to ward off possible attacks and moving livestock away from conflict hot spot zones or initiating inter-community dialogues. The study also found that inter-community meetings and negotiations developed a joint understanding between the parties that outlined modalities of access to pasture, grazing land, water and management of disputes that may arise. Such modalities were referred to as peace pacts. The author therefore recommends that indigenous early warning indicators and conflict resolution institutions be integrated into the conventional mechanisms such as the IGAD based Conflict Early Warning and Response (CEWARN) Mechanism.

Background

The biggest challenge facing indigenous and conventional early warning conflict indicators is that they have a short lag time before conflict outbreaks occur. This means responses are mostly reactive instead of preventive. In addition, early warning conflict indicators are not always accurate hence it is hard to persuade political leaders, state and non-state actors to mount an early action response. It is recommended that timely and appropriate prevention initiatives should be undertaken during the dormant

stages of violent conflicts . Causes of conflict amongst West Pokot communities are complex and include limited access to water and pasture resources, loss of traditional grazing land, transformation of cattle raids from traditional means of replenishing herds to commercial cattle rustling that results in loss of lives and destruction of property. There is also diminishing role of traditional institutions in conflict management that is coupled with political incitement, non-responsive governments' policies and inter-ethnic hostility . Maintaining security within Kenya's borders is still a core function of the national government and has not been devolved. The Kenyan Conflict Early Warning and Response (CEWARN) mechanism is adopted from the IGAD CEWARN. The system conducts conflict monitoring by receiving and analysing information from its peace actors (local peace structures) that operate across the counties and in conjunction with the media. The conflict early warning indicators generated are disseminated to different actors for possible action. This means that there is no one institution at county level charged with the coordination and response of CEWARN information. This results in delay in responses and undermining of existing indigenous conflict resolution mechanisms. In addition, the response is often security based through deployment of chiefs, county commissioners and administrative police . To address this challenge, the government has had a paradigm shift by focussing less on conflict early warning and focussing more on 'Peace early warning'. Peace early warning mechanisms involves the monitoring and analysis (for a given conflict) factors that sustain peace. The community is then involved in monitoring when these peace indicators stop prevailing hence forecast an impending conflict . Indigenous knowledge is still intact amongst the Pokot Community in West Pokot County. The communities have a vast body of knowledge on early warning conflict indicators and resolution mechanisms that are part of a well-structured, time-proven social system inclined towards reconciliation, maintenance and improvement of social relationships. The methods, processes and regulations are deeply rooted in the customs and beliefs of the people . The main aim of this paper was to determine existing indigenous early warning mechanisms used to mitigate conflict amongst West Pokot Communities as well as document the indigenous peace building initiatives in West Pokot.

Findings

The study revealed that the Pokot community had a rich repository of indigenous early warning indicators (Table 1) that are used to predict an impending resource based conflict. Most of these indicators are based on observation of domestic and wild animals, people, environment and celestial bodies' behaviour or state.

Table 1: Indigenous early warning conflict indicators amongst the Pokot community

Indicator/observation	
Prophet(foreteller) seers	He/ she can predicting future conflicts through dreaming and this gift is only bestowed on a specific clan
Animals behaviors	Livestock are anxious and have a reduced appetite as they keep on raising their heads while grazing as if in anticipation of danger.
Braying of Donkey	Although it is a fact that donkeys like to bray in the morning or evening, braying consistently especially at odd times of the day indicates the occurrence of unusual events.
Barking of baboon	Whenever baboons bark at night, it is an indication of a stranger being around.
Examination of goat intestine	Elders or gifted community members examine goats intestine position and this reveals if community is at threat of being attacked by enemies
Rock hyrax	If the rock hyrax makes noise in the night this is an indicator of a stranger being around.
Moon	When the color of new moon is reddish it is a sign of dangers likely to occur within that month.
Morning drizzles	It is believed that when that rain drizzles in the morning it is a sign of tears and killing or raiding is going to take place
Throwing of shoes	An expert in shoe throwing can predict if conflicts is going to happen, example if the front shoes point on "enemies" direction then it indicate that enemy is coming
Rainbow	It believed by the local community that when the sun is surrounded by a rainbow it indicates an impending danger.
Foot print	Pokot community wear different shoe designs from their neighboring communities who they perceive as "enemies" therefore if the foot print of an "enemy" is found within the Pokot territory then it's a sign of an impending raid.
Migration of Elephants	It is believed that Elephants are sensitive animals, they can predict drought, once Elephants migrate the elders anticipate a drought
Singing of women	In pastoralist communities, women can incite young men by singing songs that incite them to participate in cattle rustling
Rain season	Pastoralist communities during the dry spell often call for a peace truce so that they can be able to share the little resource at conflict hot spot boarder regions. However, once the rains start peace deals are forgotten and raiding begins so as to replenish stock that could have died due to drought or simply to expand herds which are linked to higher social status.

These finding are similar to that documented by Ruto and others in 2004. Observation of these early warning indicators was done by a community member who then relayed the information to the elders in the community. The elders then sought consult from the prophet or a community member known to have the gift to predict an impending attack through throwing of shoes. Other gifted elders also verified the information through examining the intestines of goats, which has been found to be accurate with most community members adhering to its interpretation. Once the information is verified as true the elders advised community members to move their homes and livestock from hot spots areas.

The study also found that elders also asked warriors to station themselves in strategic places to ward off possible attacks or engage in pre-emptive strikes. To further ensure the community is protected a ritual called 'putyon' was performed, in this ritual elders advised the community to sacrifice a goat of a specific colour to the gods so as to protect the community from external attacks. Warriors were also sent to survey the community's territory and borders so as to look for presence of foreign (external) shoe footprints made by the warring neighbouring community. It was also noted that women especially girls were catalyst of conflicts as they often sang songs that praised successful warriors and ridiculed those considered as under performers in cattle raids. Warriors who had killed enemies were spoon-fed by girls and given special goatskin clothes (atele) as a sign of honour. Brave warriors were also smeared with special oil made from milk or animal fat on their foreheads. Such practices were noted to prompt warriors to engage in cattle raids and kill as many enemy warriors as possible so as to be considered brave in the eyes of the girls and society. KIIs revealed other superstitions that determined if a conflict was impending, for example if warriors were going for a raid and animals like warthogs crossed their path, they would abandon the raid as a warthog is a bad omen that indicates the raids will not be successful. Other bad omen signs included warriors falling sick suddenly before a raid and if a tree fell on the path of warriors on a raiding mission.

Indigenous Peace Building Initiatives in West Pokot

The study found that Inter-community meetings and negotiations were extremely important in preventing inter-ethnic conflicts. During the dry season, the Pokot engaged in peace seeking missions with other communities as dry season grazing areas are often located in other communities' territory. The study established that even after brokering of peace pact through the council of elders, sometimes conflicts flared up depending on the intensity of the socio-economic hardship the communities were undergoing. Peace building initiative in West Pokot County have been enhanced by TeglaLorupe Peace Race Foundation which was founded in 2003 by the renowned world athlete TeglaLorupe, who is a Member of the Pokot community. This peace initiative engages warring communities in sporting activities as well as sensitises them on the importance of peaceful coexistence. The rival Communities, through the help of the foundation, organize annual cultural fashion shows and peace races which brings together the Pokot, Turkana and Karamoja communities from Uganda.

The author was also informed through interviews and literature review that Pokot

elders initiated negotiations with enemy communities. Such meetings involved highly respected community elders. The elders tabled their collected intelligence information while negotiating for peace. If convinced that the consultations were genuine especially when there is a traditional peace pact between the said communities, the respective elders would promise to go back home and advice their warriors (ngoroko) to abandon the planned raid. During this meeting, neutral communities were sometimes requested to act as mediators and arbitrators. Decisions were arrived by consensus.

Among other things, the elders came up with a compensation scheme to appease affected communities in case there was a revenge or retaliation attack planned after the death of a community member. For instance, the elders could agree that the concerned community would pay 100 heads of cattle to the family of the slain person as compensation. The compensation scheme is not uniform as supported by various literatures . For example, between the Pokot and Turkana communities the compensation is currently at 100 cattle for every slain person while between the Pokot and Marakwet, the Kolowo declaration puts the figure at 40 cows. The Pokot community usually enters into peace pacts during the dry season. The peace pact allows them access to pasture and water in the neighbouring communities territories. After the elders agree that a peace pact has been brokered, the communities are asked to donate bulls, milk, honey and come with "instruments of death". During the material day of the ritual, the donated steers are slaughtered. All the instruments of death that is spears, arrows, bows, knives, and swords are collected destroyed and are buried in a pit with a mixture of milk, honey, traditional beer and intestinal fluids. The mixture is then buried while elders from the concerned communities verbalize curses to whoever flouts the brokered peace pact .

However, despite all these elaborate rituals sometimes the youth who mostly take part in raids undermine the elders' authority when the rainy season sets in and engage in commercial driven cattle rustling. Despite women being identified as one of the conflict instigators, KIIs and FGDs revealed that women also play a key role in conflict prevention and resolution. For example conflicts between Pokot and Marakwet came to an end during the period when a Marakwet woman Honourable ChebiiKilimo became a Member of Parliament. She asked young men who used to participate in cattle rustling to take an oath not to engage in conflict by jumping over the birth belt called leketio. Leketio is a belt, which supports pregnancy hence life. Leketio is considered a powerful charm that protects children from harm. Before warriors set out for a raid, each of them informs his mother so that she can wear the belt while he is away. To prevent conflicts, women can sometimes refuse to wear the belts prompting the warrior to abandon the raid mission. Women may also lay their belts in front of warriors who are about to go for a raid. Crossing a leketio is considered a curse. For instance, when fighting is raging, a woman may remove her leketio and lay it between the fighting men. The fight ceases immediately. The concept of using pregnancy belt to halt or prevent conflicts is the same in all the 18 Kalenjin sub tribes.

Conclusion

The Pokot community has been able to prevent a number of conflicts through proper utilization of the early warning information generated from their indigenous knowledge system. The community elders are a crucial component of peace building initiatives renowned athletes like TeglaLorupe has also initiated conflict prevention strategies through the sports for peace race that empowers reformed warriors by giving them resources such as financial support or cattle once they surrender their guns. This aids them to engage in more peaceful livelihoods. However these indigenous early warning indictors and peace building institutions have not been integrated with the conventional Conflict Early Warning and Early Response mechanisms.

Recommendation

Indigenous early warning indicators and conflict resolution institutions should be integrated into the conventional mechanisms such as the IGAD based Conflict Early Warning and Response (CEWARN) Mechanisms.

Acknowledgement

First and foremost I would like to convey my deepest appreciation to Konrad-Adenauer-Stiftung (KAS), Kenya for the support in developing this publication. Particular gratitude goes to the programme coordinator for the Food security project, Edwin AdogaOttichilo. Secondly I would like to thank the West Pokot Community members for their cooperation and enthusiasm when sharing their indigenous knowledge on conflict early warning indicators and institutional arrangements. Lastly, I am grateful for the editorial and technical inputs received from Prof. Jesse Njoka and Dr Pauline Gitonga from the University of Nairobi's African Dryland institute for sustainability (UoN-ADIS).

Author information

Lolemtum Joseph Timu is the county disaster management officer in charge of the West Pokot Disaster Management Unit.
Contact: lolemtumjoseph@gmail.com

Role of women in averting food insecurity in West Pokot County of Kenya

Daniel Ehagi

This discussion paper looks at how women have diversified their livelihood strategies to mitigate food insecurity in West Pokot County of Kenya. West Pokot communities were historically pastoralists but challenges such as increased drought episodes have led to degradation and scarcity of the natural resource base. The scarcity of natural resources has in turn led to conflict and loss of livestock assets. Many Pokot families especially women have diversified into non-pastoralist based livelihoods such as beekeeping and crop farming. Agricultural research in Africa has demonstrated the unique role played by women in building rural economies as they are the majority of crop farmers, farm labourers and value addition entrepreneurs. Women roles in agriculture are dynamic and resilient. However, women have less access when compared to men to agricultural assets, inputs and credit. This paper aimed at describing the role played by women in mitigating food insecurity in West Pokot County of Kenya. The paper findings are based on a rapid appraisal study conducted using primary and secondary data collection techniques that included purposive focus group discussions and key informant interviews that were supported by an in-depth literature review. The study found that half of the population in the County was made up of women whose level of literacy was low. In addition, despite women composing of more than half of the crop farming labour force they were not engaged during development or implementation of activities that sought to address food insecurity in the County. Furthermore, they were not often the target beneficiaries or disseminators of drought early warning information. This exclusion means that their diversified crop production livelihood was always at risk from drought hazards. The author recommends that adult education for women be part of the gender mainstreaming programme that aims at empowering women to engage in commercial agriculture. In addition, extension and other advisory messages such as drought mitigating strategies should target women crop farmers. State and non-state actors in West Pokot should advocate for the adoption of policies (new constitution and land policy) that have allowed women to own land. Land ownership will go a long way in strengthening access to financial services. Women farmers should also be encouraged to adopt new agricultural technologies which will reduce labour and improve efficiency and farm production.

Background

Kenya's agricultural sector is characterized by gender inequalities this is evidenced by studies carried out by United Nations Economic Commission for Africa (UNECA), the African Development Bank (AfDB) and the World Bank. One of these studies carried out a comparative gender analysis and found that in Kenya, men's gross value of output per hectare of land is 8 percent higher than women's. However, if women had the same access to factors of production like land, labour and capital the value of their output would increase by 22 percent. Gender inequality in the agriculture sector is therefore an economic and social issue and

gender mainstreaming policies and activities can be a potent force for accelerating poverty reduction . Women make essential contributions to agricultural and rural economies in developing countries. Women roles vary considerably between and within regions and are changing rapidly in many parts of the world, where economic and social forces are transforming the agricultural sector. Rural women often manage complex households and pursue multiple livelihood strategies. Their activities typically include producing agricultural crops, tending to animals, processing and preparing food, working for wages in agriculture or other rural sectors. In sub-Saharan Africa (SSA), women contribute between 60 and 80 percent of the labour for food production, for both household consumption and commercial purposes. This trend will persist to hold as the rapid urbanisation in SSA is characterised by more men migrating out of rural areas to seek employment in urban areas .

The agricultural sector in many developing countries like Kenya is underperforming, in part because women, who represent a crucial resource in agriculture and the rural economy through their roles as farmers, labourers and entrepreneurs, are facing severe constraints. The main constraint is lack of land ownership rights. Lack of land ownership means that women lack collateral and hence cannot access credit. Many developing countries including Kenya have legally affirmed women's basic right to own land but actual female control of land is rarely observed. This is especially so for pastoralists' communities which are heavily patriarchal in nature such as those found in West Pokot . West Pokot communities were historically pastoralists but challenges such as increased drought episodes have led to degradation and scarcity of the natural resource base. The scarcity of natural resources has in turn led to conflict and loss of livestock assets. Many Pokot families especially women have diversified into non-pastoralist based livelihoods such as beekeeping and crop farming . This paper aimed at describing the role played by women in averting food insecurity in West Pokot County of Kenya.

Findings

Role of women in averting food insecurity

The population of West Pokot County is approximately 50 percent women who rely heavily on agriculture for their livelihood. They are also the most vulnerable group to drought and other climatic hazards such as floods as they have limited access to early warning climatic and extension information. Women in the county are energetic and spend more time in the farms when compared to men. Focus group discussions (FGDs) and Key informant interviews (KIIs) with women farmers indicated that the women felt that they were oppressed as they were the ones that provide most of the farm labour and harvest yields but only receive meagre earnings after sale of produce by their husbands. Agricultural produce produced in the county included livestock, milk, beans, maize and potatoes. The findings from the KIIs also indicated that most women had no formal education. This is because of the cultural norm that prefers women who are not educated and have undergone female genital mutilation as they fetch a higher bride price. This high illiteracy levels means that West Pokot women farmers may not understanding the agricultural early warning information disseminated to them. Livestock and crop agriculture is the backbone of West Pokot County's economy. The county has a mixture of agro-ecological zones. In

the high potential highlands such as Lelan and Kaibichbich, dairy farming is practiced together with maize and coffee production which is under rain-fed production systems. In the drier lowlands such as Alale and Weiwei a mixture of pastoralism and irrigation are practiced4. Key informant interview with the Wei farmers' association acting manager revealed that the irrigation scheme received massive funding from the Italian government and this allowed 275 hectares of land to be put under irrigation. He also indicated that more than 600 pastoralist families were now growing crops and these members collectively earned over 40 million Kenya shillings in the 2015-2016 last season harvest. The farmers also cultivate maize, sorghum, bananas, fruits and vegetables. The acting manager also noted that the success of the scheme had a ripple effect on other communities outside the scheme with an estimated 100,000 farmers in West Pokot and Turkana counties investing in crop production using furrows and drip irrigation. This in turn has led to peace prevailing in a region that had been ravaged by cattle rustling and banditry activities.

In West-Pokot several government and non-governmental joint initiatives are currently working to increase women's role in agricultural productivity and access to markets. The initiatives have encouraged women to share knowledge and productive assets including land, livestock and credit. This supportive collective structure is also extended to marketing systems where the women form producer organisations so as to have a better bargaining power for their produce. These social networks also create a safe environment for women to meet, share information and tackle social problems such as gender-based violence. These groups have also empowered women allowing them to participate in decision-making and take up leadership roles. Several women in West-Pokot have been elected as local councillors . In July 2015, FAO-UN and county government of West Pokot capacity build eight groups comprising of a total of a hundred persons who were mostly women. The groups were taught how to propagate fruits (papaya, banana, avocado and mangos). The seedlings are grown in the county government of agriculture fruit nurseries and then sold to farmers who grow the trees in their farms this has dramatically changed the landscape of West Pokot Central region . Demonstration plots managed by FAO are being used to train pastoralists drop outs who are transitioning into farming. These farms also grow green vegetables. Farm produce has improved the nutritional levels of children and diversified household diets hence increasing household food and nutritional security as well as improving incomes as farm produce is sold within and outside West Pokot to towns such as Kitale and Eldoret. This is one worthy example that can help the County of West Pokot can learn from in terms of dealing at a larger scale, with her current nutrition challenges. In addition, the women project beneficiaries are gradually being assisted to sell their produce by creating market linkages with consumers and encouraging value addition of the products. For instance, one of the women groups in Lomut is currently producing mango chips that are sold in the local markets. FAO-UN has also helped construct market stalls along the Lodwar -Turkana highway where fruits are sold by women.

Women as disseminators of agricultural early warning information

Women are able to obtain early warning information on agricultural related activities from NDMA county offices, county government, non-governmental organizations, Kenya Meteorological Department and Agricultural Sector Development Support Programme (ASDSP). Key informant interviews indicated that the women are hosted in radio talk shows of which they talk on the issues surrounding fertilizer distribution, food security and seed distribution. This information is disseminated through the local vernacular radio stations such as Kalya FM, North Rift FM and Saposema FM. Women are therefore at the fore front of strengthening capacities in agriculture and advocating for crops that can be grown. For example on 29th Feb 2016, MaendeleoyaWanawake members were hosted in the local vernacular radio station to inform farmers how the issuing of subsidized fertilizers to farmers in West Pokot will be carried out by the national cereal and produce board (NCPB) West Pokot branch.

Conclusion and Recommendations

The author recommends that adult education for women be part of the gender mainstreaming programme that aims at empowering women to engage in commercial agriculture. In addition, extension and other advisory messages such as drought mitigating strategies should target women crop farmers. State and non-state actors in West Pokot should advocate for the adoption of policies (new constitution and land policy) that have allowed women to own land. Land ownership will go a long way in strengthening access to financial services. Women farmers should also be encouraged to adopt new agricultural technologies which will reduce labour and improve efficiency and farm production.

Acknowledgement

I would like to acknowledge Konrad-Adenauer-Stiftung (KAS), Kenya for the support in developing this publication. Particular gratitude goes to the project Coordinator for the Food security project, Edwin AdogaOttichilo. I would also like to thank the West Pokot farming women groups for their cooperation and enthusiasm I am grateful to University of Nairobi's Reuben Waswa from the African Women's Studies Centre (AWSC) and Dr. Pauline Gitonga from the African Dryland institute for sustainability (ADIS) for their editorial and technical input.

Author Information

Ehagi Daniel is from MasindeMuliro University of Science and Technology, Kakamega, Kenya.

Contact: ehagidaniel@gmail.com

Cattle rustling as the Achilles heel to Disaster Risk Reduction (DRR) in Baringo County, Kenya

Duke Onchomba and John Kimosop

Baringo County has been plagued with cyclical conflicts due to cattle rustling. Cattle rustling is thought to be part and parcel of the pastoralist culture and livelihood. This article is based on information gathered from key informant interviews that was enriched and evidenced withliterature review. The paper aimed at identifying first, factors that perpetuate cattle rustling in Baringo North and South and secondly, describing the existing mitigation strategies that are in place to reduce cattle rustling incidences. The findings show that cattle rustling mainly occurs between the Tugen, Pokot, Marakwet and Samburu communities. Factors that trigger conflict include; the availability of fire arms, commercialization of cattle raids, political incitement, lack of integrations of DRR and conflict resolution policies, cultural practices and erosion of traditional conflict resolution mechanisms. The authors recommend that security be improved at institution of learning, school dropout youths should be capacity build with livelihood diversification strategies such as bee keeping, dryland crop farming and eco-tourism. Given that security is not a devolved function, national government should involve community elders to promote continuous dialogue among rival communities and during planning and implementation of disarmament activities. In addition, state and non-state actors at national and county levels need to lobby for parliament to pass into law the draft 2011 Kenyan Disaster Management Policy that proposes a multi-hazard, multi-risk or all-hazard approach. This will integrate conflict resolution mechanisms in disaster risk reduction activities.

Background

Baringo County is vulnerable to natural and man-made disasters that threaten food security through disruption of livelihoods and destruction of the natural resource base. In recent decades, recurrent drought episodes have led to resource based conflicts that mainly manifests as cattle rustling . Cattle rustling is defined as the act of using guns to forcefully loot livestock assets from one community by another and leaving behind destruction of property and loss of lives. This term is distinguished from cattle raids which is the traditional practice of stealing livestock from one community by another without the destruction of property or loss of life . Traditionally, Baringo North and South communities practiced cattle raids using crude weapons such as; sticks, spears, bows, arrows and clubs. These raids were practiced as a trade-off by poor families to acquire livestock and restock their herds particularly after droughts or disease epidemics. However, in the 1990s the cattle raid practice transformed and is now a commercial entity as most livestock stolen are driven out of the county and are never recovered. The main actors financing cattle rustling are often politically connected and may sometimes not be part of the pastoralists communities. Recent literature indicates that cattle rustling is rampant during the wet season. This is

because of presence of dense vegetation for cattle rustlers to hide in, livestock are also better nourished and therefore stronger to withstand long distance trekking. In addition, the availability of surface water and pasture make it easier to move animals across remote locations that are inaccessible by security vehiclesthat are used to track stolen animals.

Findings: Factors promoting cattle rustling

Cultural practices

Key informant interviews with a ward administrator from Mukutani ward indicated that dowry or bride price payment can sometimes be as high as 200 heads of cattle. Amongst Pokot community, dowry is paid at once while amongst Marakwet the dowry is staggered over a life time. This factor may be responsible for the high turnout of raids conducted by Pokot men. Other cultural rites of passage such as Sapana which is a Pokot male traditional rite of passage to elder hood also encourages cattle raid. During Sapana ceremony, the man spears his favourite bull and serves meat to his friends and other elders, after which he is officially introduced to the elder hood club and is allowed to participate in community matters as an elder. Those who have not served sapana meal have no say in community matters. Thus sapana encourages young men to acquire bulls by whatever means so that they can gain respect in the society. Women have also been identified to escalate cattle raiding because they celebrate successful rustlers with songs while use mockery songs to shame those who did not participate in raids. The women regard men with large herds of cattle as brave warriors while those without as cowards. Old held community rivalry exist between the Tugen, Pokot and Samburu communities that reside in Baringo North and South. The county commissioner indicated that Tugen and Pokot clashes are the most common.

Availability of illegal fire arms

Key informant interviews with Baringo county commissioner and a police reservist indicated that most cattle rustlers were young boys who are school drop outs and are between 12 and 17 years of age. The Baringo county education officer noted that approximately 37,000 pupils could be out of school following closure of 25 schools due to recurrent incidences of insecurity which targeted schools as well as led to people fleeing their homes and seeking shelter in schools. The county commissioner also noted that there was easy access to illegal fire arms in Baringo North and South and boys as young as 12 years of age once recruited into the banditry team were given firearms after minimal fire use training. He further noted that due to the lack of proper training on fire arm use most of these young boys during raids shot indiscriminately and this may be the cause of the rising number of deaths in young children, women and elderly who were in the past not targeted during raids. A 2014 report by IRIN which is a humanitarian news agency indicated that approximately 100 people lose their lives annually in Baringo North and South due to conflict related to cattle rustling. Cattle rustling hinders social and economic development in Baringo and should be categorised as a disaster as it results in increased food insecurity and child hood malnutrition as people cannot herd their livestock or farm in their farms due to risk of being attacked . The Mukutani ward administrator supported this claim as he indicated that approximately 164,457 Baringo residents sought refuge in Mukutani ward and Muchongoi wards in 2015 due to

cattle rustling incidences in Marigat, Yatia, Kasiela and Lomoiywet regions.

Lack of integration of DRR and Conflict resolution policies

Conflict is seen as a fundamentally different event from a natural disaster, and it therefore requires distinctive and separate programming. In addition, the perceived notion that effective and sustainable disaster risk management can only be implemented in stable (non-conflict) environments has resulted in most state and non-state organizations shying away from introducing DRR programmes in conflict prone areas . This is despite many researchers and organisations acknowledging the existence of an interface between conflict and natural disasters. Most humanitarian organisations working in conflict prone areas like Baringo have separate programmes and policies for peace-building/conflict mitigation and natural disaster risk management. In 2012, out of a total of 34 countries reporting humanitarian crises and requiring external assistance from the UN Food and Agriculture Organization, 10 of these were conflict related situations and 15 were a mix of conflict and natural hazards. Only nine were as a result of natural hazards alone. This highlights two points: first, the role of conflict as a causal factor in the predominant number of disasters and second, the likelihood of overlap between different causal factors. In Kenya, security matters are still a core functions of the national government but disaster management is still not clear if it is devolved or not. This fact has resulted in confusion on how to handle conflict at devolved county level as conflict incidences lead to humanitarian disasters in conflict prone regions. Kenya has well-organized disaster risk management institutional framework in place for example the National Drought Management Authority (NDMA) and the National Disaster Management Unit (NDMU). Another government body, the National Steering Committee on Peace Building and Conflict Management fulfils a similar function with regard to conflict. This office serves formally as the Conflict Early Warning and Response Network (CEWARN) unit for Kenya and is officially run by the Intergovernmental Authority on Development (IGAD), but with national ownership and participation. CEWARN focuses mostly on early warning, with some effort on response, but not so much on prevention or mitigation. These aforementioned organisation was in the past focused on their core mandates but in 2011, the Government of Kenya (GoK) developed a comprehensive DRR strategy, the National Disaster Management Policy. This policy has a strong focus on disaster risk reduction, emphasizing the importance of preventive and mitigating measures to minimize the impact of a disaster. The policy goes beyond focusing on natural hazards and takes an "all hazards" approach. Furthermore, the National Steering Committee (NSC) under the National Policy on Peace building and Conflict Management is collaborating with NDMA to integrated peace building into drought-mitigation programming. This is done through an organization called Peace Dividend that encourages communities in conflict and drought affected areas to disarm and share resources. However, the authors of this discussion paper did not find evidence that there was integration of conflict resolution and drought or disaster mitigation activities in Baringo North and South level.

Political Instigation

The authors noted that during the recent insecurity incidences in Baringo, a local television network interviewed residents of Kalabata and Barwesa regions in Baringo North. The community named several local politicians who they linked with the cyclical insecurity incidences. This is similarly evidenced by a 2015 doctoral study by Ombaka that explained Kenya's insecurity. The study supported previous findings that found that political incitements was linked to nearing of the election period. In addition, the increasing human population and increased trend of pastoralist settling around rural urban areas in communally owned land has sparked land grabbing fears amongst pastoralist communities. Politicians have taken advantage of this situation by promising the community they will evacuate enemies or intruders in their land in exchange of votes. Instigation is also seen when a politician perceives that he may lose because a certain community or clan will not vote for him. The politician will then instigate conflict that results in displacement of the group from his voting constituency

Lack of livelihood diversification options

The Kenya National Bureau of Statistics (KNBS (2013) ranked Baringo as number 32 out of 47 poorest Counties. The community in Baringo County depend on pastoralism as their main source of livelihood. Therefore any calamity such as drought or disease leaves the residents without any alternative. This may also be a reason that most of the raiders are compelled to cattle rustle so as to replenish their livestock herds after the passing of these calamities. However, cattle rustling is also a new livelihood strategy for the youth who cannot accumulate livestock herds, hence they engage in raiding for commercial purposes and as means to accumulate wealth and gain social status in their community.

Erosion of traditional conflict resolution institutions

In response to the cattle rustling menace the communities in Baringo have evolved over time and institutionalised an elaborate system and mechanisms of resolving conflicts whether intra-community or inter-community. The elders command authority that makes them effective in maintaining peaceful relationships and community way of life. The authority held by the elders is derived from their position in society. They control resources, marital relations and networks that go beyond the clan boundaries, ethnic identity and generations. The elders are believed to hold and control supernatural powers reinforced by belief in superstitions and witchcraft . However, with urbanisation and modernisation, the youth who are mostly involved in cattle rustling are challenging and shunning these traditional ways. Furthermore, national and county administrative structures do not recognise the resolutions passed by the elders. However, growing community and civil society activism has brought to light the important role played by these traditional institutions in peace-building or conflict resolution. They elders are now integrated into local peace committees (LPC), or similar kinds of interventions at the local level. The notable concern that was highlighted during interviews with the ward representative and county commissioner was that national led disarmament activities did not engage the LPCs elders or allow them time to foster an agreement between warring communities.

The lack of LPCs critical role especially in disarmament activities is further eroding these traditional peace building institutions.

Conclusion and Recommendations

Resolution of cyclical cattle rustling conflict is due to complex often related factors including availability of fire arms, commercialization of cattle raids, political incitement, lack of integrations of DRR and conflict resolution policies, cultural practices and erosion of traditional conflict resolution mechanisms. The authors recommend that security be improved at institution of learning, school dropout youths should be capacity build with livelihood diversification strategies such as bee keeping, dryland crop farming and eco-tourism. Given that security is not a devolved function, national government should involve community elders to promote continuous dialogue among rival communities and during planning and implementation of disarmament activities. In addition, state and non-state actors at national and county levels need to lobby for the signing into law of the draft 2011 Kenyan Disaster Management Policy that proposes a multi-hazard, multi-risk or all-hazard approach. This will integrate conflict resolution mechanisms in disaster risk reduction activities. Since the ownership of the land or border issue has been a major problem besieging the communities, the Independent Electoral and Boundaries Commission (IEBC) should aid in clear demarcation of the land so as to avert the insecurity escalation in the region. The County government should also invest in social amenities and infrastructure such as roads and communication this will enhance rapid response to disasters and conflict in Baringo North and South.

Acknowledgement

Our deepest gratitude is first to God whose inspiration helped us develop this research work. We also acknowledge the financial and moral support accorded to us by Konrad-Adenauer-Stiftung (KAS), Kenya. We pass our deepest gratitude to the communities in Baringo North and South particularly residents of Mukutani Ward. We acknowledge the immense role played by the County Commissioner of Baringo and the Ward Administrators from whom we sourced the valuable information that allowed this article to be a reality. Our sincere gratitude also goes to our family who accorded us ample time to complete the work. Lastly we thank Prof. Jesse Njoka and Dr. Pauline Gitonga from the University of Nairobi's African Dryland Institute for Sustainability. Your editorial and technical guidance was highly appreciated.

Author information

Onchomba P. Duke is the Youth Coordinator at the Catholic Diocese of Eldoret. Kimosop K. John is the County Ward Administrator for Mukutani Ward in Baringo South
Contact: dukeonch@gmail.com

Theme 2: Lessons in Disaster Risk Reduction and Early Warning

Deepening the understanding of NDMA's Drought Early Warning System: The case of Baringo County, Kenya

Amos Nyakeyo

Drought hazard negatively impacts on the social and economic development of Baringo County. Drought episodes in Baringo have in the recent past increased in frequency and severity. This has eroded the household capacity to sustain livelihoods and food security. Drought is classified as a slow-onset disaster and is therefore suited for monitoring using early warning systems (EWS) whose information can then be used to develop contingency plans as well as set in motion early response or action. In Kenya, the National Drought Management Authority (NDMA) is a public body established through a parliamentary act of 2016. NDMA's main mandate is to offer overall coordination on all matters relating to drought management including implementation of policies and programmes at both national and county levels. NDMA has offices in 23 arid and semi-arid (ASAL) counties considered vulnerable to drought. NDMA through its Common Programme Framework for Ending Drought Emergencies (EDE) by the year 2022 has established mechanisms which will ensure that drought do not result in emergencies and that the impacts of climate change are sufficiently mitigated. NDMA has adopted the risk-based drought management approach using the drought cycle management (DCM) model. The DCM model has early warning system (EWS) to inform strategies for drought response, preparedness and resilience building. The DCM model is an excellent tool for mainstreaming disaster risk reduction in the pastoralist livelihood context. The DCM model has reduced the prominence of reactive relief response and emphasised the need for disaster mitigation and preparedness activities. The NDMA drought EWS system is community based with data collected at household level and triangulated through a series of scientifically proven indicators to characterize drought conditions, including trends and specific thresholds that are critical to trigger early response or action. This review paper is aimed at deepening the understanding of NDMA's EDE activities for state and non-state actors in Baringo County. The paper also highlights problems faced in disseminating drought early warning information and gives possible recommendations for course correction.

Background

NDMA is a public body established through an act of parliament in 2016. NDMA's main mandate is to offer overall coordination on all matters relating to drought management including implementation of policies and programmes at both national and county levels. The government of Kenya has made a commitment to end drought emergencies and their related catastrophic impact by the year 2022. The actions needed to achieve these are set out in the Drought Risk Management and Ending Drought Emergencies Medium Term Plan (MTP) for 2013-17, which is part of the Kenya Vision 2030 Second Medium Term Plan. The EDE initiative is a new approach that recognises that droughts

cause emergencies because the foundations needed to support sustainable livelihoods in drought prone areas principally security, infrastructure and human capital (education, health and nutrition) are weak. The EDE initiative will accelerate investment in these sustainable livelihood foundations as well as strengthen the institutions responsible for managing drought risks in the 23 drought prone ASAL counties of Kenya .NDMA is implementing the EDE initiative through a Common Programme Framework that will ensure stronger alignment and coordination of investment and activities between the national and county governments as well as align investment activities of development partners. To operationalize the EDE common programming framework the EDE activities are centred around six pillars. The MTP six pillars outline how to harmonise the actions and resources of the Kenya government and its development partners. The focus of the Drought Risk Management Pillar, or Pillar 5, is to develop and strengthen the institutions, mechanisms, and capacities that build resilience to drought and climate change. Drought risk management cuts across the first four EDE pillars (peace and security, climate-proofed infrastructure, human capital and sustainable livelihoods) but also relies on them to build the foundations for drought-resilient livelihoods .

Most of Baringo County is ASAL and is prone to recurrent drought episodes. Drought hazards negatively impacts on the social and economic development of Baringo County. Drought episodes in Baringo have in the recent past increased in frequency and severity. This has eroded the household capacity to sustain livelihoods and food security as well as resulted in increased incidences of conflict over natural resources . Conflict and drought are mutually reinforcing. The inter-community competition over natural resources has increased insecurity incidences that are manifested as conflict. Insecurity in turn increases vulnerability to drought by impeding migration, curtailing access to services and resources, destroying assets and damaging inter-community relations . Drought is a natural climatic phenomena that has been shown to have a cyclical occurrence. Historically severe drought in Kenya occurred every 10 years, however, with effects of climate change severe drought is now occurring every three to five years . The cyclical and slow onset nature of drought makes this hazard best suited for monitoring using early warning systems (EWS) whose information can then be used to develop contingency plans as well as set in motion early response or action2. NDMA has adopted the risk-based drought management approach using the drought cycle management (DCM) model. The DCM model (Figure 1) has early warning systems (EWS) at each of the model four phases. These indicators inform strategies for drought response, preparedness and resilience building. The DCM model is an excellent tool for mainstreaming disaster risk reduction in the pastoralist livelihood context. The DCM model has reduced the prominence of reactive relief response and emphasised the need for disaster mitigation and preparedness activities . This review paper is aimed at deepening the understanding of NDMA's EDE activities for state and non-state actors in Baringo County. The paper also highlights problems faced in disseminating drought early warning information and gives possible recommendations for course correction

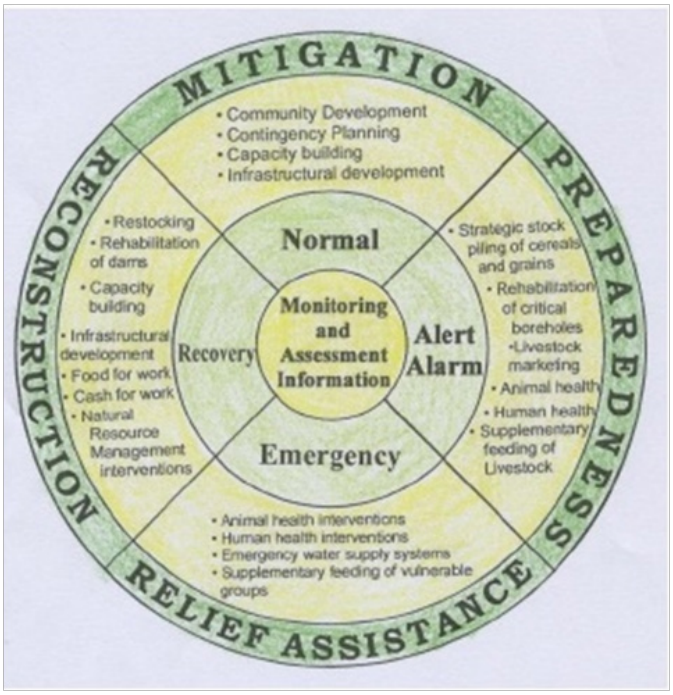

Figure 3: Drought Cycle Management model illustrating the four phases and related early action interventions

Findings

The current NDMA drought EWS model mirrors the DCM model phases and takes the household as the unit of analysis. The EWS involves data collection on diverse indicators from sentinel sites representing the vulnerable livelihood zones in Baringo County. There are 9 sentinel sites with 30 households each currently being monitored these were reduced from the 16 previously recruited. Each site is monitored for 12 months, each site also has a local community member who is appointed by the community and works with the Baringo county drought monitoring NDMA staff. The design of the NDMA drought EWS dictates that the drought monitoring official maintains constant contact with the community and hence the choice of a suitably qualified community member. During monthly data collection, the drought monitoring officer uses qualitative tools of sentinel household and community key informant's questionnaire interviews as well as observation to track two (2) categories of indicators. These indicators serve as EWS for an impending drought.

The data collected for the 2 indicator categories is summarised below;

1. *Biophysical indicators* measure the environmental conditions for each livelihood zone. The information is gathered from the County Meteorological Department, this was further supported through observation and information gathered from household and key informant interviews during focus group discussions with the community. Data is collected on precipitation events such as rainfall

onset, quantity and spatial- temporal distribution, Forage (Pasture and browse) in terms of quality and quantity and trends in water availability including percentage of water in the water pans and distances that has to be travelled by households and animals to access the water pan. This indicator generates the standardised precipitation index (SPI), percentage of water in the water pans and vegetation condition index (VCI) data reported in the monthly drought early warning bulletins.

2. *Socio Economic Indicators* measures household access and utilization of food through evaluating trends in household food consumption. The socio-economic indicator is reported in the monthly drought early warning bulletins under three sections. (i) Production indicators that include livestock migration pattern; livestock body condition; main livestock (cattle) milk production levels and record of livestock deaths (due to drought or disease), (ii) Household food access indicators that include market functionality/Terms of Trade (ToT); Milk Consumption levels; Water access level with regard distance trekked in kilometres; Area of crops planted in the current season and crops yield percentage and (iii) Utilization indicators that include measuring the Mid-Upper Arm Circumference (MUAC) so as to assess the health and nutritional status of children between 12 and 59 months of age. Coping Strategy Index (CSI) and occurrence of water- borne diarrhoea diseases.

The above indicators are collected every mid-month from the 9 sentinel sites in each drought prone livelihood zone in Baringo County. Once collected the NDMA drought monitoring officer carries out an initial onsite assessment of the drought status and he then informs the community through a focus group discussion of the preliminary drought status and compiles recommendations for each technical sectors (agriculture, veterinary and water and environment county departments). He then advises the community on which colour of flag to raise (Alert-Yellow, Alarm-Orange, Emergency-Red and Recovery-Green). The NDMA officer then forwards the information to the NDMA national office where the data is analysed using secondary data (meteorological and remote sensed NDVI[1] data from FEWSNET[2]). The national office uses the secondary data to monitor the 2 indicators trend with relation to what is the "normal" range. They then classify the Baringo County livelihood zones (pastoralist, agro pastoralist and irrigated under one of the four phases that mirror the DCM model; Alert, Alarm, Emergency and Recovery phase. Once analysis is done the NDMA national office publishes a soft copy of the drought early warning bulletin[3] by the 5th day of the succeeding month. In Baringo the weather and climatic forecasting has also embraced indigenous knowledge such as observing celestial bodies (stars), vegetation status, behaviour of animals and reading the intestines of a slaughtered goat. These indigenous EWS are more trusted by the community[4]. When compared to conventional EWS such as the NDMA drought EWS model[5]. However, despite their importance, NDMA has not been able to integrate this indigenous information into their monthly early warning bulletin[7].

Types of stakeholder advisory messages and actions generated by the NDMA's early warning drought bulletin

Livestock sector

- Appropriate choice of livestock species and suitable breeds.
- Migrations to seasonal grazing convergence zones.
- Negotiated access to drought survival resources
- Activation of sector drought response plans.
- Deliberate commercial livestock off-takes.
- Accelerated commercial off-takes.
- Livestock vaccinations to ensure livestock markets are protected.

Agriculture sector

- Dissemination of advisories on choice of crop species and suitable varieties for drought tolerance and escape.
- Adoption of climate smart water agricultural technologies.
- Postharvest/post-production handling including food storage and preservation strategies.

Current NDMA communication strategy

- Dissemination of drought early earning bulletins is mainly through e-mail circulation by the NDMA Baringo official to technical state and non-state stakeholders in a mailing list that is constantly being updated with new recipient addresses.
- Bulleting information is also the subject of discussions during the monthly County Steering Group (CSG) meetings and monthly community FGD platforms.
- NDMA has produced colour coded flags (that signify which DCM phase the county is in). The flags are raised at strategic locations across the 9 sentinel sites to relay county's drought status. However, these flags are old, torn with faded colours so most sited no longer display them.
- The community through ward administrators receive a hard copy of the drought EWI bulletin. It's not clear if the contents reach the community members as NDMA has no feedback mechanism to evaluate if the information in the bulletin was understood by all stakeholders and if it resulted in early action to mitigate drought.

Conclusions and Recommendations

- The NDMA drought Early warning system is fully operational in Baringo County as evidenced by the timely production of the monthly early warning drought bulletins. The stakeholder forums organised by Baringo County NDMA official at grass root and government levels has provided a platform for different stakeholders to engage in DRR activities to manage and mitigate drought episodes in the county. These engagements have allowed better coordination of the different county government departments charged with ensuring food security.

- The main challenge facing NDMA is that there is no feedback mechanism built in its EWS drought model so they cannot ascertain the capacity of the stakeholders to appropriately use the bulletin information. This means that there is no evidence to link the bulletin information with the drought response activity mounted by the various state and non-state actors. In addition, the appropriateness and timeliness of intervention actions by stakeholders and to what extent these actions resonate with long term resilience building has also not been evaluated.

- There is need integrating indigenous drought early warning indicators into the NDMA bulletin. This will promote timely and appropriate community action. This will also serve as documentation for future research.

- There is need for NDMA to adopt new and innovative approaches for disseminating the drought early warning and advisory messages to communities. For example. NDMA should consider translating the bulletin which is in English into the local vernacular language and have this information relayed through the local radio station programmes. These radio programmes should be interactive and allow the community to call in. The call in sessions will provide NDMA with a wider coverage and give them the much needed feedback mechanism.

Acknowledgment

I would like to acknowledge Konrad-Adenauer-Stiftung (KAS), Kenya for the support in developing this publication. Particular gratitude goes to the programme coordinator for the Food security project, Edwin AdogaOttichilo. I am thankful to the continued support given by the County Government of Baringo and the local community members. I acknowledge Mr.Reuben Waswa from the African Women's Studies Centre (AWSC) and Dr. Pauline Gitonga from the African Dryland institute for sustainability (ADIS) for their editorial and technical input.

Author Information

Amos O. Nyakeyo is the Baringo County Drought Response Officer for the National Drought Management Authority (NDMA).

Contact: amos.nyakeyo@ndma.go.ke

Linking Participatory Scenario Planning (PSP) with Early Warning Weather Forecasting in West Pokot County of Kenya

Peter Owoko and Lazarus Wepukhulu

The paper reviews how the Agricultural Sector Development programme (ASDSP) in collaboration with the Kenya Meteorological Services (KMS) and other partners adopted the participatory scenario planning process (PSP) to enhance and strengthen the development of weather forecast information and their appropriate technical advisories and ensure effective dissemination of the same. The PSP process integrated the conventional forecast by KMS with the indigenous traditional knowledge (ITK) forecast by community experts. This integrated information was then tailored to each livelihood zone in West Pokot County. The communities in turn used this early warning weather information to engage in sustainable livelihoods such as pasture/ fodder production or setting up enclosures for dry seasoning grazing, water harvesting, planting appropriate crop varieties and instituting preventive measures against crop and livestock pests and diseases. Other disaster mitigation strategies adopted included the construction of soil conservation structures such as terraces and commercial livestock de-stocking and restocking. The PSP process was able to foster collaboration amongst the different county departments that are directly or indirectly involved in ensuring food security in West Pokot County. The PSP process also allowed a feedback and follow up mechanism that had not been in existence before, this nurtured the trust and use of weather forecast information by West Pokot communities. Communities were then able to use this information to re-orient their livelihood strategies thus making them more sustainable and resilience to climate induced hazards such as drought.

Background

Access to and use of weather forecast information is critical to understanding the varying and changing climate that influence the livelihoods and development of West Pokot communities who are heavily reliant on small holder rain-fed agriculture. An early warning system was introduced in the County (District by then) by the former Arid Lands Resource Management programme I and II (2000-2009) to help monitor the drought that had become more frequent due to climate change. The programme had trained monitors in the initial ten administrative divisions who collected information on weather and reported to the coordinator. Monthly bulletins were developed and distributed to the government agencies within the district. Based on the bulletin information the individual sector specialists were then expected to individually identify intervention areas and advise the pastoralists/farmers accordingly. Each partner was also expected to undertake interventions pertaining to their section and where necessary seek donor support for example form the World Food Programme (WFP). This approach was not all inclusive and it largely only prepared actors on

response management. Early warning is a major element of disaster risk reduction. It prevents loss of life and reduces the economic and material impact of disasters. To be effective, early warning systems need to actively involve the communities at risk, facilitate public education and awareness of risks, effectively disseminate alerts and warnings and ensure there is constant state of preparedness.

A complete and effective early warning system supports four main functions: risk analysis, monitoring and warning; dissemination and communication; and a response capability . Integrating early warning system into generation of climatic and weather forecasting information has been shown to build the resilience and livelihoods for vulnerable communities leaving in arid and semi-arid areas of Kenya . Agricultural Sector Development Support Programme (ASDSP) is being implemented by the Government of Kenya (GoK) in collaboration with development partners and other stakeholders. ASDSP main mandate is to support the government in the implementation of the strategies identified in the Agriculture Sector Development Strategy, 2010–2020 (ASDS) and the Comprehensive African Agricultural Development Programme (CAADP).The main goal of ASDSP is to support the transformation of Kenya's small holder agricultural sector into an innovative, commercially oriented, competitive and modern industry that can contribute to poverty reduction and improved food security in rural and urban Kenya. ASDSP fulfils this goal through promotion of viable and equitable commercialization of the agricultural sector through value chain development .

West Pokot County is prone to the occurrence of hazards such as droughts, floods and diseases epidemics disasters. These disasters disrupt livelihoods, destroy infrastructure and divert planned use of resources that interrupt economic activities and retard development . The root cause of the county's vulnerability to drought lies in its dependence on rainfall for its economic and social development which is entirely reliant on agricultural activities such as crop and livestock production . To address this challenge, ASDSP, KMS and other partners adopted PSP process to help farmers, pastoralists and other actors in the agricultural sector use early warning weather forecasting information in promotion of sustainable livelihoods and value chains in West Pokot County. This discussion paper outlines findings of a study that reviewed how effective the PSP process was in developing and disseminating the integrated weather forecasting information in the last three years that is 2014, 2015 and 2016.

The review also documented the technical advisories messages developed so as to inform livelihood re-orientation across the three livelihood zones (agro-pastoralist, pastoralist and mixed farming) of West Pokot County. Before PSP process was initiated West Pokot communities relied heavily on ITK weather forecasting information. However this ITK was not able reach every user and was less reliable due to use of non-scientific indicators. At the same time, weather forecasting done by KMS was too broad to be understood by the farmers/ pastoralists as it was generated for large geographical areas like North Rift, Central or South Rift. The KMS information was equally limited in dissemination as it was packaged only in Swahili and English languages .

The generation of the integrated weather advisories information are developed in a workshop where ITK experts, target information users and conventional KMS and county department officials in agriculture, livestock and environment meet and agree on how to package the information and what advisories messages need to be generated. The developed advisories were disseminated through different communication avenues such as radios, public meeting (barazars), internet and printed bulletins. The radio messages are live interactive sessions in the local Pokot language and they allow community participation and a wide outreach coverage. The PSP forums also follow up and determine the effectiveness of the forecasted advisories and their utilization or adoption rate in the communities across the three livelihood zones.

Findings

The PSPs process is carried out in four stages which include: preparation meetings, workshop, dissemination and monitoring and evaluation. The PSP process targets all the ASDSP supported value chain actors which include: men, women, youth and the physically challenged in the Community. Since the introduction of the PSP process in West Pokot County during the long rainy season of March 2014. The community's trust of the KMS weather forecasting information has been natured as demonstrated by the increased demand for the integrated information and rising figures of the beneficiaries (Table below).

Table 2 Number of value chain actors reached in the years under review

Dissemination Channels	Month and year of advisory message				
	MAM 2014	OND 2014	MAM 2015	OND 2015	MAM 2016
	Number of Value Chain Actors Reached				
Local radio FM	50,000	60,000	75,000	135,000	200,000
Barazas	603	481	875	905	985
Website	20	21	26	28	30
Brochures	5,000	1700	3,000	1000	1000
Field days	1200	950	600	746	807
Schools	2600	3000	4500	7700	11,000
Churches	6200	3050	4900	6500	8300
PSP Workshops participants	60	37	32	27	25

Key: MAM- March, April and May
October, November and December

The PSP process generated early warning weather forecasting information are disseminated in three main languages English, Kiswahili and local vernacular-Pokot. Women, youth and physically challenged persons are purposely targeted during mobilization to participate in the workshop and during dissemination.

How PSP process has promoted Sustainable Livelihoods

The process has supported promotion of sustainable livelihoods in that the integrated weather forecast information for every season generates technical advisories targeted to the three livelihoods zones in the County.

The advisories messages are normally composed of the likely hazards, risks, opportunities, impacts and possible actions. The advisories provide opportunities for farmers/pastoralists to make decisions that ensure their livelihoods are sustained through the year. Based on these advisories, farmers/ pastoralists undertake the following activities summarised below;

- Pasture/fodder production and setting up enclosures to ensure adequate fodder for the livestock during the dry season.
- Water harvesting by constructing water pans
- Crop and livestock pests and diseases control preventive strategies
- Construction of soil conservation structures like terraces
- Commercial livestock de-stocking and re-stocking

These technical advisories are shared among all the partners in the sector and have gone a long way to assist the farmers and pastoralists to undertake appropriate interventions towards making their livestock and agriculture enterprises sustainable. For the other value chain actors such as livestock brokers, traders, processors, transporters and consumers the integrated weather forecast advisory information helps them plan when and what to invest in.

Case study

An ASDSP supported value chain group located in Masol in 2014 engaged in commercial pasture production with the aim of providing feed for their animals during dry season and sell surplus hay. The group planted 50 acres of pasture and at the end of the season, they harvested 710 kilograms (kgs) of seed that were sold at 400/= per Kg with the group earning Kenya Shillings (Kshs) 284, 000. In addition, 800 bales of surplus hay after feeding their livestock was sold at Kshs. 200 per bale and this earned the group a further 160,000 Kshs. The grass species planted were *Boma Rhodes* and *Eragrostissuperpa*that are agro ecologically suited for Baringo County. The group has expanded its operation and is now growing pasture on 100 acres.

Conclusion

The PSP process was able to foster collaboration amongst the different county departments that are directly or indirectly involved in ensuring food security in West Pokot County. The PSP process also allowed a feedback and follow up mechanism that had not been in existence before, this nurtured the trust and use of weather forecast information by West Pokot communities. Communities were then able

to use this information to re-orient their livelihood strategies thus making them more sustainable and resilience to climate induced hazards such as drought.

Recommendations

- Mainstream the PSP integrated weather forecasting information into County disaster risk reduction strategies.
- Invest in research is needed to document the reliability and effectiveness of the ITK weather forecasting information.
- Support the strengthening the institutional capacity for response to this integrated early warning weather forecasting information at all levels and especially support local level engagement in collating and sharing information by provide adequate funding and technical support.

Implementation constraints

- Strong attachment to livestock by the pastoralists and agro-pastoralists, such that even when the drought is inevitable they hardly destock.
- Communal land ownership making implementation of commercial interventions complex. Livestock are allowed to freely browse and graze even on areas where pastures are being commercially grown or where enclosures have been created. This is causing conflict incidences.
- Inadequate funding resources especially for some interventions such as excavation of water pans or dams,
- Livestock migrations in search of water and pasture hinders effective disease control interventions such as administering of preventive vaccinations.

Acknowledgment

The review paper has been made successful as a result of various partners who have participated at one level or another during the PSP process and while developing this document. We thank them for giving their time, resources, professional talents and skills. We wish to acknowledge the following for their valuable contribution, the County director Meteorological Services (CDMS-KMS) for leading the PSP process, the County departments of Agriculture, Livestock, Fisheries, Veterinary and Water/ Land Reclamation, Kenya Forest Service, Water Resources Management Authority and National Drought Management Authority. We also wish to appreciate the National programme Secretariat for initiating the PSP process in the County by fully funding the first and second seasonal processes. Finally, I would like to thank University of Nairobi's Reuben Waswa from the African Women's Studies centre (AWSC) and Dr. Pauline Gitonga from the African Dryland institute for sustainability (ADIS). Your editorial and technical input greatly enriched this review paper.

Author's information

Peter O. Owoko-CC and Lazarus W. Wepukhulu-ERSIO are from the West Pokot County Agricultural Sector Development Support Programme (ASDSP).

Contact: asdspwestpokot@yahoo.com

Meteorological perspectives in addressing Flood and Landslide disasters in Baringo and West Pokot Counties of Kenya

Ruth K. Nguma

The paper examines the meteorological perspectives in addressing flood and landslides disasters in Baringo and West Pokot Counties of Kenya. The paper utilizes secondary sources of literature augmented with validation of emerging data through key informant forums organized by Konrad-Adenauer-Stiftung (KAS) in Baringo and West Pokot. Findings indicate that although there have been meteorological early warning systems (EWS) through Kenya Meteorological Department(KMD), there is little or lack of effectiveness of such EWS to realize Disaster Risk Reduction. This is due to the packaging of the EW messages and coverage owing to limited number of staff in each county. In addition, there is only one well-established River-based flood early warning system in Kenya. This has disadvantaged West Pokot and Baringo Counties. Moreover, landslide early warning system by KMD lacks the geological aspect, hence such warnings may be associated with a high percentage of false alarm. Social-cultural issues and lack of political good will to support and lobby for funds to enhance KMD's EWS has led to high incidences of false alarm associated with KDM forecasts. This has in turn led to low confidence and uptake of KMD EWS messages. The study recommends that KDM EWS be mainstreamed into DRR activities and integrated with traditional EWS. County government together with KDM county staff should carry out civic education for at-risk communities and political leaders so as to foster community and political good will. Both national and county governments should invest in advanced technologies that will improve the accuracy and reliability of KDM EWS.

Background

In recent times, there has been an increase in devastating effects of weather and climate-related disasters such as droughts, floods, landslides and other weather-related hazards across the globe owing to climate change. The Greater Horn of Africa region which includes Kenya has suffered the brunt of these weather related disasters such as droughts, floods and landslides which have affected millions of populations in the region . A good percentage of natural disasters such as floods and landslides are hydro-meteorological in nature and as such addressing such natural disasters from meteorological perspective can bring about sound results and credible lessons for research and action . There is a paradigm shift from post disaster response to a proactive risk reduction approach. A pro-active approach requires meteorological, hydrological and climate services which support risk management decisions which are science-based as well as investments in early warning systems. Early Warning Systems, abbreviated EWS, are defined as a structured and organized prediction and dissemination of timely and effective information to allow individuals who may be at risk to take action to avoid or reduce

their risk and prepare for effective response. EWS is a major element of disaster risk reduction (DRR), which refers to a sum of measures that can be undertaken in the event of a hazard turned to a disaster to reduce human and social vulnerability . Hydro-meteorological hazards have increased in magnitude and frequency1. These hazardous events are associated with food in security as they cause volatile food prices and destruction of infrastructure. Hydro-meteorological hazards have resulted in increased economic losses they are however associated with lowered incidences of human loss in United States, France, Bangladesh and Cuba amongst others developed countries. This is because the aforementioned countries have put in place more effective coordination, communication and emergency preparedness at both national and local levels4. Empirical evidence indicate that effective early warning systems have been accepted world-wide as a component of disaster risk management. This was actualised in the Hyogo Framework for Action (2010-2015) which prioritized early warning for Action and its current successor the Sendai Framework for Disaster Risk Reduction 2015–2030 that outlines a set of possible indicators to measure global progress in the implementation of DRR programmes .

The Sendai framework asserts that effective early warning systems are an integration of four elements namely; risk analysis, monitoring and predicting of location and intensity of a hazard, communicating alerts to authorities and to those potentially affected and responding to the disaster. Unfortunately, failure of any of the four elements results to failure of the whole EWS. Advanced communication and information technologies have enhanced EWS and as such, most parts across the globe have embraced early warning systems. However, in developing countries like Kenya. There is reluctant to investment in early warning systems due to competing needs for public funds and as a result, such countries are most vulnerable to disasters when they occur . This review paper explores the lessons that can be learned in addressing floods and landslides in Baringo and West Pokot Counties of Kenya using a meteorological perspective. The findings will inform future research frontiers and subsequently offer recommendations on how to realize the effectiveness of the current KMS EWS for DRR.

Findings

Kenya Meteorological Department (KMD)

Early warning systems have been in existence in Kenya and as such, the systems have well established at the national level with an array of mandated institutions such as the Kenya Meteorological Department (KMD), National Drought Management Authority (NDMA) and IGAD Climate Prediction & Applications Centre (ICPAC)) along with an array of the indigenous Knowledge on early warning systems for flooding and landslides. KMD is the major institution mandated to issue weather related early warnings countrywide. KMD runs a flood early warning system dubbed "Western Kenya Community-Driven Development and Flood Mitigation project". The project has empowered local communities to engage in wealth creation activities reducing their vulnerability to recurrent flooding. The project also ensures structural prevention of flooding by building dykes and restoration of the flood plain through tree planting. As well, the project saw the installation of a RANET FM Radio station by KMD known as

Bulala FM. Bulala FM transmits in the local language and it is particularly meant for flood disaster early warnings. The officers at Bulala FM demystify flood early warnings to local communities who tune to the radio and get their location forecasts.

KMD flood and landslide early warning systems in Kenya

KMD is the lead agency in meteorological forecasting and as such, uses various hi-tech equipment and models that help in various forecasts. Of particular interest is the forecasting of flood and landslides throughout the country and in particular over Baringo and West Pokot Counties. KMD issues daily, five-day, seven-day, monthly, seasonal and severe weather forecasts for the whole country. In regard to flooding and landslides, early warnings are given by way of creating scenarios from the given forecast and as such, downscale it to specific counties for easy consumption by the locals. There are various indicators that KMD uses for flood early warnings and as such they take in heavy prolonged rainfall and increased River flow for several days in case of river flooding, heavy and slow-moving thunderstorms for flash floods, and the position of the Inter Tropical Convergence Zone (ITCZ) for both flash and river flooding. ITCZ is a low pressure belt that active around the equator and is associated with convective activity that results in vigorous thunderstorms. El-Nino forecast is associated with major flooding and landslides in Baringo and West Pokot Counties. All this is made possible through the use of high resolution models, Numerical Weather prediction (NWP) products and satellite imagery used for forecasting. Landslide early warnings are given whenever a likelihood of heavy, persistent rainfall over the landslide prone-areas is foreseen. Notably, landslides in Baringo and West Pokot are active during rainy season. KMD has a well-established flood early warning system for Nzoia Basin Catchment in Western Kenya6. Nzoia flood KMD early warning system has been effective and as such has led to saving of life and property since 2008. The system uses rainfall, river flow, evaporation, soil moisture and Quantitative Precipitation Forecasts (QPF) data which is then used to run model known as Galway Flood Forecasting Model with a 3-day lead time. Admittedly, this is the only well-established flood early warning system in Kenya. However, flood early warnings which are more generalized are usually issued by KMD through County Directors for Meteorological Services (CDMs) by creating scenarios from the seasonal, monthly and daily forecasts and warnings that are issued at the national level. CDMS create scenarios especially when given likelihood of heavy storms, thus they issue warnings to specific counties such as Baringo and West Pokot of likelihood of flash floods and landslides.

Effectiveness of KMD Flood and Landslide Early Warning System in Kenya

Interestingly, there is little if there is any effectiveness of the flood and landslide early warnings issued by the KMD and other related agencies along with the traditional early warning systems amongst the communities of Baringo and West Pokot. This is because KMD has not devolved its early warning system to the county level but it has only decentralized it with one CDM for each county. This limits the effectiveness of the CDM to reach the local community. As well, the early warning packaging by the KMD is not user-friendly in the sense that the local communities cannot consume it for appropriate response. Equally important, KMD uses heavy rainfall, high river flows

and localized storms as indicators for flash floods and landslides. Landslides are as a result of both hydro-meteorological and geological causes and as such, KMD's use of heavy and persistent rainfall as an indicator for landslides may sometimes result in false alarm or wrong forecast . Moreover, KMD has only one well-established flood early warning system in Kenya over Nzoia basin and as such, the other parts of Kenya including Baringo and West Pokot Counties may not benefit from a well-established flood early warning system. In the past, KMD early warnings were dismissed by most Kenyans due to high levels of false alarm associated with the forecasts7. Also contributing to the false alarms is lack of resources to purchase modern technologies to enhance forecasts. However, in the recent past, KMD has through the government invested in high-tech machinery and equipment that has increased accuracy of forecasts and warnings, and it's believed this may boost the public confidence.

Evidence of effective use of Flood and early warning system

The community dialogue forum organised by KAS noted that KMD, Agricultural Sector Development Support Programme (ASDSP) have been promoting community participatory forums whereby they demystify and downscale early warnings for preparedness and resilience activities to reduce disaster risks for the at-risk communities both in the Counties of Baringo and West Pokot. This has enhanced consumption of EW information in both Counties. CDMs in both counties have been attending these Barazas and participating in local FM Radio stations to further communicate KMD early warnings. The community dialogue forum also revealed that in 2014 a flood monitoring device was donated by Japan International Cooperation Agency (JICA) and installed by Water Resource Management Authority (WRMA) at Kaptimbor Day Secondary School, in Baringo as an early warning tool to detect flooding upstream in order to save lives downstream, especially for school children. This has saved lives and property downstream. An article by the World Food programme on 13 January 2016 pointed out that an agreement between WFP and the Baringo County government was developed so as ensure sustainable economic development through capacity building and use of early warning information for analysis and early action. On 9th November, 2014, an article that appeared in the Daily Nation pointed out on the early warning of El Nino rains to West Pokot residents through the CDM warned of impending landslides, heavy storms, flooding and lightening due to the expected El Nino rains and as such advised residents living in landslide-prone areas to move to safer grounds. Residents were also advised to plant seasonal crops as well as harvesting the rainfall water to help later during the dry season. However, despite KMD flood and landslide EWS messages being present there is little integration of KMD messages with DRR activities. This is due to a myriad of challenges that are highlighted in the next section.

Reasons for low uptake of KMD Early warnings on Flood and Landslides in Baringo and West Pokot Counties

Although Baringo County has recorded a link between early warning and response to DRR with regard to floods and landslides, there have been various challenges. During the KAS forum it was noted that there was resistance by some of the at-risk communities to relocate from the landslide and flood-prone areas. Further, EWS

effectiveness is limited by levels of poverty and illiteracy of the targeted communities as they do not understand KMD EWS messages. Furthermore there is only one well established flood early warning in Nzoia Basin system in Kenya and this cannot be used to predict floods in West Pokot and Baringo Counties as the information is not accurate and may result in a high incidence of false alarms7 and eventual mistrust by the community. In addition, each county has only one CDM hence he cannot effectively disseminate KDM EWS messages to reach a wider audience as noted during the KAS forum. It was also noted during the forum discussions that most communities do not believe in scientific early warning systems but rather they depend on their traditional early warning systems such as interpreting goats' intestines by elders or specialist who have the gift to predict rainfall or drought. This point concurs with the argument by Shilenje and Ogwang (2015) that most communities had no faith in KMD EWS but rather they relied on the traditional early warnings. Another hindrance is that KMD and other providers of scientific early warning systems like NDMA have not integrated the community and the traditional early warning systems to find a common ground for understanding. The KAS forums noted that in West Pokot County residents believed in shoe throwing, use of prophets/seer, reading of goat intestines and looking at elephant behaviour as EW indicators while in Baringo county traditional early warning concentrated on reading of goat's intestines. This demonstrates why it has not been easy for the residents in these counties to embrace scientific early warnings from KMD and other institutions like NDMA. There is also lack of political will to prioritize disaster risk reduction initiatives and activities and as such most politicians may not lobby for funds to improve KMD EWS. KMD EWS are also not effectively communicated due to the packaging of the EWS messages that are only presented in English and Swahili languages.

Besides this point, embezzlement of disaster risk management funds in both county governments was raised during the KAS forums. The Counties lacked clear guideline on how to DRR contingency funds would be distributed. One Key informant in West Pokot noted that money for DRR was being transferred from one department to another hence it ended up not doing what it was intended for. Also noted during the KAS forum, is that the community felt that moving from flood or landslide prone areas and meant that residents will be disconnected from the dead buried in these areas. Thus, they regarded KMD EWS messages as infringing on their social-cultural beliefs. Both counties faced the challenge of the at-risk communities refusing to relocate to safer grounds. They equally faced the challenge of poor land use practices with cultivation being carried out on hilly slopes and mountain cliffs along with cultivation on the areas near rivers and flood plains. A factor that enhanced river sedimentation and flooding during heavy rainfall. In addition, both counties faced deforestation challenges which also contributes to increased incidence of landslides.

Conclusions and recommendations

The study concludes that it will remain an uphill task to mitigate against floods and landslides in West Pokot and Baringo counties due to entrenched traditional cultural beliefs, lack of political good will, deforestation, poor communication and ignorance and failure to entrench EWS advice by KMD and other relevant institutions like NDMA into county DRR activities and frameworks. In view of

the above conclusion, the author proposes the following recommendations;

1. The counties should embrace an integrated approach where traditional early warning system are integrated with the scientific KDM EWS messages. This will increase the adoption of weather related EWS in in West Pokot and Baringo Counties.
2. KDM should invest in advanced technologies to generate flood and landslide early warnings scenarios. This will enhance accuracy hence foster community confidence and reliability on the warnings.
3. More resources should be directed to the devolved KDM services in Baringo and West Pokot. These devolved EWS will then be able to hire more staff to ensure more coverage of the counties as well as generate sufficient geophysical data to improve flood and landslide predictions.
4. KMD should develop a replica of the Nzoia Basin flood EWS for West Pokot and Baringo Counties.
5. Political good will ensure support in setting up a contingency funds for flood and landslide emergencies. This fund can also be used to compensate residents who need to relocate from flood and landslide prone areas. As well as set up mitigation strategies such as planting trees (reforestation) and establishing of flood control structures like dykes.
6. KDM EWS messages should be mainstreamed into county DRR frameworks and should form part of the county civic education capacity building, DRR preparedness and readiness drills.

Acknowledgements

I would like to acknowledge Konrad-Adenauer-Stiftung (KAS), Kenya for their support. Particular gratitude goes to Edwin Ottichilo KAS, Coordinator for the food security project. I am indebted to Prof. Felix Kioli from South Eastern Kenya University (SEKU) and Irene Mwende. Their editorial and technical input greatly enriched this discussion paper.

Author information

Ruth K. Nguma is a Senior Meteorologist in the Kenya Meteorological Department.
Contact: ruthkt10@gmail.com

Policies and Legislative Frameworks in guiding Disaster Management in Baringo County, Kenya

Amos Langat

This paper describes policy and legislative efforts in Baringo County to manage disasters. It utilized secondary sources to collect data as well as personal experiences from Baringo. Baringo County is faced by a number of natural hazards and disasters that have increased in numbers and complexities in the recent years causing deaths, food insecurity, destruction of livelihoods and infrastructure. In spite these disasters, there is lack of a policy and legal framework that incorporates disaster management and early warning as an integral component in development planning. Consequently this makes the response to disaster reactionary and uncoordinated. The County Government has recognized the need to address the institutional gaps by strengthening early warning for disaster risk reduction through policy intervention by initiating the process of drafting the Disaster Management Policy. Although this policy is yet to be implemented into law, it provides comprehensive linkage between early warning and response through the legal and institutional framework for effective disaster risk reduction in Baringo County.

Background

Disaster management is often used in a general sense to cover the implementation of disaster preparedness, mitigation, emergency response and relief and recovery measures. In a more general term, disaster risk reduction is often used to mean the broad development and application of disaster management policies, strategies and practices to minimize vulnerabilities and disaster risks throughout the society, through prevention, mitigation, and preparedness . Disaster management, therefore, involves forecasting and taking precautionary measures before an imminent threat when advance warnings are communicated early. Each of the disasters, however, has its peculiarities regarding the occurrence, speed, type of response and the amount of resources required to address the events . The magnitude of a disaster further depends on the characteristics, the probability, the extent of the susceptibility of the hazard and the exposed elements based on the prevailing physical, social and environmental conditions. Disasters are highly concentrated in poor countries where the exposure to disaster risks is higher than risk-reducing capacities. People are therefore usually unprepared, and when the event occurs, it usually triggers chaotic reactions, which often result in crisis management . The 2010, World Disaster Report indicates there is an escalation of disastrous events across the world these has attracted increased focus on disaster management. Disaster risk is a global phenomenon, but not all areas or populations across the world experience equal threats from the same hazards.

At present, many countries around the world spend a significant percentage of budgetary allocations in disaster mitigation and disaster preparedness to minimize losses arising from the onsets of disasters. Africa alone suffers close to 60% of all disaster-related hazards in the world . This is possibly as a result of the type of hazards that specifically affect Africa and the prevailing

circumstances that make it easier for any disaster to spiral and multiply its impacts. The magnitude of a disaster depend on the characteristics, the probability, intensity of the hazard and the susceptibility of the exposed elements based on the prevailing physical, social and environmental conditions4. In Kenya's context, the disaster profile is dominated by droughts, fire, floods, terrorism, technological accidents, diseases and epidemics. This situation is similar in Baringo County where the draft county hazard atlas lists numerous disasters that afflict the region time over time. This paper describes policy and legislative efforts in Baringo County to manage disasters. It utilized secondary sources to collect data as well as personal experiences from Baringo.

Findings

Profile of Baringo Disasters

Baringo County is one of the most disaster-prone counties in Kenya. It is affected by numerous natural hazards which have over time caused disastrous impacts to both lives and livelihoods.

The following major hazards are experienced in Baringo County and include:-

1. Drought

Drought is a major hazard resulting from intensification of the effects of climate change and unpredictable weather patterns that have exposed the natural and agro-ecosystem environment to harsh climatic conditions . Baringo County is both an Arid and Semi-arid County (ASAL) and experiences frequent droughts especially in Baringo South, East Pokot and Mogotio sub-counties. These ASAL areas are predisposed to drought and other natural disasters that have shaped the livelihood structures predominantly pastoral, agro-pastoral, mixed and marginal farming resulting in total crop failure and consequently food insecurity.

2. Natural resource-based conflict

The natural resource based conflict arising from the menace of cattle rustling in East Pokot and Baringo North sub-counties has largely affected access to pasture and water for livestock apart from causing massive displacement to the affected communities and loss of lives and livelihoods. The Baringo County Integrated Development Plan – CIDP (2013-2017), recognizes insecurity as one of the challenges affecting development and daily economic activities in the County.

3. Floods

Recurring floods have been witnessed particularly along permanent and seasonal rivers in Baringo and areas surrounding Lake Baringo and Bogoria. In the year 2013, heavy rains increased water levels of Lake Baringo forcing close to 2,000 people in KampiSamaki area to flee their homes for higher grounds. Other areas affected by floods in Baringo County include Marigat, Mogotio and East Pokot. In May 2016, for example, Marigat sub-county experienced floods after raging storm water from upper region caused a runoff that swept through Marigat town causing flash floods in the plain areas of Perkerra and Ilchamus. River Perkerra bursts its course unleashing havoc and terror that killed four people, displaced hundreds and destroyed properties worth thousands of shillings. Subsequently, the floods caused massive mud deposits at Block II in Perkerra and deeply eroded farmlands at Tugen Hills and Edao farmlands completely destroying farm crops and livelihoods.

4. Land slides

In the year 2012, mudslides submerged at least 37 households and displaced about 46 families after heavy rains rocked Sacho, Kabarnet and Tenges areas spreading across five villages resulting in deaths and

seriously leaving a score of people injured. Other disasters in Baringo include Land degradation, fire, and accidents that have presented an increase in vulnerability to the affected communities though at a minimal magnitude.

Policies and legislative frameworks on disaster management

The third United Nations Conference on Disaster Risk Reduction held in Sendai Japan noted that the roles of disaster risks are critical towards enabling communities and other stakeholders to come up with policy interventions to understand the disaster risks, to boost their preparedness and ultimately, their management. Majority of disasters experienced could be prevented and loses mitigated if only there are proper disaster preparedness measures and policies in place. Most countries in the globe, especially in developed counties have very well established policies and legislative frameworks which guide management and mitigation against disasters. However, most developing countries are struggling with disasters due to degrees of unpreparedness and lack of policies and legislative frameworks to guide disaster management. For instance, the response to disaster risks in Kenya has been slow and often reactive due to lack of a comprehensive disaster preparedness policy and legal frameworks that integrates and coordinates approaches to disaster response5.

The National Policy on Disaster Risk Management had been reviewed and redrafted over the past ten years but never reached parliament. Until 2013, Kenya did not have a formidable policy framework within the spirit and context of the Constitution. Three years later, even with the framework in place, the policy is still a draft which has resulted in enormous resources spent on short-term interventions through the provision of relief aid rather than building long-term preventive measures. It has further complicated the establishment of institutional arrangements that invest in mid and long term interventions both at the National and County levels. The draft policy seeks to mainstream Disaster Risk Reduction in the development process and establish a National Disaster Preparedness and Management Center which will coordinate and convey information on Disaster Risk Management from the national level .Baringo County experiences numerous disasters and does not have an entrenched policy to manage disasters. However, in conjunction with various stakeholders, the County has embarked in a process towards the formulation of a Disaster Risk Management Policy. Baringo County is in the final stages of the policy making process. The last policy discussions and capacity building activities were held in 2016 supported by Konrad Adenauer Stiftung – KAS. The policy discussion forum targeted the Ward and sub-County Administrators . Other stakeholders that supported the process included United Nations Development Program (UNDP) and World Food Program (WFP) who facilitated the County Executive Committee (CECs) to conceptualize and strengthen Disaster Risk Reduction, Ending Drought Emergencies and Climate Change Adaptation. The Draft Baringo County Disaster Management Policy seeks to establish disaster response, recovery and rehabilitation unit that seeks to address preparedness and response; and recovery and rehabilitation. It also creates cash equivalent to food and non-food reserve as a disaster preparedness intervention strategy for maintaining sufficient grain

reserves and stockpiles in strategic locations within the county for responding to food insecurity.

Additionally, the National Drought Management Authority (NDMA), has been proactively and continuously involved in strengthening the county's capacity for disaster risk management by supporting the development of the County's Hazard Atlas. NDMA exercises overall coordination in all matters relating to drought management in both agro-pastoral and pastoral livelihoods zones. It generates and disseminates information on early warning, drought management and climate change adaptation through the monthly bulletin. However, in spite the efforts of NDMA to provide early warning details on disasters, Baringo County still remains prone to cyclical disasters. However, there is now progress towards the establishment of a County Disaster Management and Coordination Office under the Deputy Governor's office which is responsible for handling disaster management and coordinating responses in collaboration with other like-minded stakeholders and partners . It is imperative to note that the new Constitution of Kenya promulgated in 2010 in its chapter four. It lays down a foundation for the formulation and adaptation of legislations, policies and strategies to disaster risk reduction through a provision of a Bill of Rights that safeguards the right to a clean and a healthy environment. The Fourth Schedule gives the mandate of disaster management to both the National and County government. It is, therefore, the principal obligation of both governments to protect its citizens from disaster risks by streamlining disaster risk reduction to development frameworks and policies. In line with the provision of the Fourth Schedule of the Constitution of Kenya, the County senate council developed the Baringo County Governments Disaster Management Bill, 2014 which provides for efficient management of disasters by the county governments. It establishes County Disaster Management Committee responsible for developing County Disaster Management Plan that provides strategic directions for the development and implementation of the County Disaster Risk Management Policy. Coupled to the above efforts, the Baringo County Integrated Development Plan (CIDP) and the Annual Development Plan (ADP) recognizes the challenges faced in Baringo as far as disaster management is concerned. It, therefore, seeks to strengthen Early Warning System through the establishment of disaster information centres at Mogotio and Chemolingot and an integrated drought early warning system at the county headquarters. These centres will be responsible for providing dynamics on disaster risks prevention, mitigation and preparedness interventions for early warning by prioritizing preventative and proactive measures over reactive measures. The CIDP further provides a framework for disaster management by establishing a context for Participatory Disaster Risk Analysis (PDRA) that places communities at the center of all Disaster Risk Reduction planning and mainstreaming. The realization of the participatory approach is however hampered by the slow adaptability of the community to Disaster Risk Management practices, response and the low technical capacity required for the purpose of resilience building

Conclusion and Recommendations

From the foregoing literature, it is clear that Baringo County is faced with numerous natural hazards and disasters. In spite of these disasters, there is lack of a County policy to direct the management of disasters. At the national level, the National Policy on Disaster Risk Management is still at draft stage thus it cannot be operationalized or cascaded down to county Governments. However, there are efforts through other agencies to manage disasters, for instance NDMA, through drought early warnings whose advisory messages cut across the different sectors in the county. Since there is no coordination office the responses to NDMA early warning messages are often delayed making them reactionary and uncoordinated. The study therefore recommends that there is need by County and national Government to fast-track the establishment of effective policies and legislative frameworks that will help in guiding and coordinating disasters response and management. Disaster management plans in the county should be guided by clearly set out policies to promote disaster risk reduction through early warning and early response.

Acknowledgements

I would like to acknowledge Konrad-Adenauer-Stiftung (KAS) support in facilitating the development of this paper. Particular gratitude goes to Edwin Ottichilo KAS- Programme Coordinator- Food security project. I am also indebted to Prof. Felix Kioli from South Eastern Kenya University (SEKU) and Irene Mwende. Their editorial and technical input greatly enriched this discussion paper.

Author information

Amos Langat is an associate Consultant at the One Africa Capacity Building and Consultancy Services. Contact: kimutailangat007@gmail.com

General Conclusion and Recommendations

This paper publication entitled "Strengthening the concept of Early Warning for Disaster Risk Reduction and Food Security: Practices and Lessons from Baringo and West Pokot Counties of Kenya" was borne out of gaps identified after an Early Warning System situational analysis conducted between the 3rd and 13th of April 2016 in Kenya. The main objectives of this paper publication is to communicate knowledge and ideas from people working within Baringo and West Pokot counties on EWS which would be utilised to mitigate against DRR and inform NDMA's EDE pillar 5 implementation strategy. In order to set the stage for the publication of the papers, four workshops were held the first two workshops were held in Baringo and West Pokot Counties respectively and provided a platform for authors to share their ideas and practices to community, state and non-state stakeholders. KAS, Kenya also took this opportunity to share with the authors at County level the Chatham report that would guide them refine their papers in preparation for the national workshop that was held on 23rd November 2016. This national paper presentation session was the third workshop and was jointly organised by UoN-ADIS. The national workshop allowed the paper authors to receive technical and editorial guidance from experts drawn from a pool of experienced state and non-state actors who are DRR and EWS practioners and researchers. The fourth and final workshop was in form an early warning systems expert discussion meeting that sought to seek views from partners under NDMA pillar 5. The expert meeting was held on 7th December 2016. The meeting allowed the editorial team to draw valuable insights from participants and ensured that the general conclusion and way forward was put into context with the NDMA's Common Programme Framework for Drought Risk Management. The seven papers can therefore be used to course correct state and non-state actors DRR and EWS programmes at national and county levels. The seven papers presented in this publication have been have been grouped under two main themes. The list below gives the name of theme and the undersigned title of papers that fall under each theme;

Theme 1: Indigenous Early Warning Systems and Practices

1. Indigenous early warning conflict indicators amongst West Pokot Communities of Kenya. By Joseph Tame Lolemtum
2. Role of women in averting food insecurity in West Pokot County of Kenya. By Daniel Ehagi
3. Cattle rustling as the Achilles heel to Disaster Risk Reduction (DRR) in Baringo County, Kenya. By Duke Onchomba and John Kimosop

Theme 2: Lessons in Disaster Risk Reduction and Early Warning

4. Deepening the understanding of NDMA's Drought Early Warning System: The case of Baringo County, Kenya. By Amos Nyakeyo

5. Linking Participatory Scenario Planning (PSP) with Early Warning Weather Forecasting in West Pokot County of Kenya. By Peter Owoko and Lazarus Wepukhulu
6. Meteorological perspectives in addressing Flood and Landslide disasters in Baringo and West Pokot Counties of Kenya. By Ruth K. Nguma
7. Policies and Legislative Frameworks in guiding Disaster Management in Baringo County, Kenya. By Amos Langat

Data for the above papers was gathered through a multi-method approach which included personal experiences and observations ,Key informant interviews, group meeting workshops (by KAS) for authentication, focus group discussions and literature review (secondary source) relevant to the study. The first paper indicates that West Pokot communities have embedded indigenous practices in their culture which aid in mitigating against disasters, including conflict. The indigenous practices are well known to all mature residents including children and passed on from generation to generation They include observation of abnormal domestic and wild animal behaviour as well as the state of the celestial bodies such as moon and stars. In addition, the authors of this paper found that the role of women in the conflict process is dual, they can instigate or mitigate conflict. The second paper also details how cattle rustling has played a part in de-railing peace and disaster reduction initiatives in Baringo County. The paper highlights how cattle rustling is so entrenched amongst the Tugen, Pokot, Marakwet and Samburu communities due to ubiquitous availability of fire arms, commercialisation of cattle rustling, political incitement and paucity of conflict resolution policies that fail to integrate DRR policies with conflict resolutions as well as policies that ignore or erode existing indigenous conflict resolution mechanisms. The last paper under theme one, highlights the key role played by West Pokot women in mitigating household food insecurity and building resilience through income generation through crop production.

The second theme papers focused on lessons that can be learned from four key institutions that release DRR early warning messages that eventually impact on food security in the target counties. These included NDMA, ASDSP KDM and Baringo County government. NDMA's role in managing disasters is anchored in approaches outlined in the Common Programme Framework for Ending Drought Emergencies (EDE) by the year 2022. The papers highlight the scientific and participatory methods used to come up with early warning messages for drought, flood and landslide disasters and the shortcomings encountered when interpreting or communicating to the community this information. The overarching lesson encountered in the three papers under theme 2 was that participatory scenario planning (PSP) with communities allowed them to utilise their indigenous knowledge systems to generate EW messages and early action plans. The PSP had fostered the community's trust in contemporary EW messages and increased their demand for EW forecasting messages for drought but not for landslides or floods. In addition, despite PSP being a proven scientific way to capture community knowledge and activities this indigenous EW indicators were note documented in the NDMA bulletin. Other recommendations were that KDM and NDMA needed to repackage the EW messages so

as to be better utilised by the community. In addition, the two institutions needed to develop a feedback mechanism that can track if the EW advisory messages resulted in early action and how they were contributing to buildingresilience of drought prone areas and communities.

End Note References

1 Food Security Mapping and Analysis Report (2016). A report by the Konrad-Adenauer-Stiftung, Kenya.

2 Jason Mosley (2016). Early Warning Systems in Kenya: Linking development and drought resilience planning. A report forKonrad-Adenauer-Stiftung by Chatham House; Royal Institute of International Affairs based in the United Kingdom.

3 West Pokot County Integrated Development Plan (CIDP)- 2013-2017)

4 Jason Mosley (2016). Early Warning Systems in Kenya: Linking development and drought resilience planning. A report forKonrad-Adenauer-Stiftung by Chatham House; Royal Institute of International Affairs based in the United Kingdom

5 Baringo CIDP 2013-2017.

6 Jason Mosley (2016). Early Warning Systems in Kenya: Linking development and drought resilience planning. A report forKonrad-Adenauer-Stiftung by Chatham House; Royal Institute of International Affairs based in the United Kingdom

7 Haider, H., (2014). Conflict: Topic Guide. University of Birmingham. Retrieved from: http://www.gsdrc.org/docs/open/CON69.pdf

8 Ombaka Dick. (2015). Explaining Kenya's insecurity: The weak state, corruption, banditry and terrorism. International Journal of Liberal Arts and Social Science Volume 3(3): 11-26.

9 Nairobi Peace Initiative Africa and Global Partnership for the Prevention of Armed Conflict (GPPAC) Eastern and Central Africa region (2009).Mobilizing Early Response Project-Kenya.https://www.peaceportal.org/documents/130276236/9333adac-0b05-4214-beaa-20d33eed26fd

10 TeglaLoroupe peace race a resounding success (2014). An International Association of Athletics Federations publication retrieved from https://www.iaaf.org/news/iaaf-news/tegla-loroupe-peace-race-athletics-better-work

11 Ruto P., Mohamud A. and Isabella M. (2004). Indigenous Democracy: Traditional Conflict Resolution Mechanisms Pokot, Turkana, Samburu and Marakwet

12 Opiyo et-al, (2012), Resource-based conflicts in drought-prone North-western Kenya: The drivers and mitigation mechanisms International Rescue Committee, Nairobi, Kenya.

13 Pkalya et-al, (2004), Indigenous Democracy Traditional Conflict Mechanisms: Pokot, Turkana, Samburu and Marakwet, A publication of ITDG-EA.

14 Government of Kenya (2012).A guide for mainstreaming gender in the agricultural sector. The National Agriculture and Livestock Extension Programme (NALEP).

15 Food and Agricultural Organisation of the United Nations-FAO-UN (2011). The State of Food and Agriculture 2010-11: Women in agriculture: Closing the gender gap for development.

16 Vera N. K. John N. W., Magnus J. and Gert N. (2015).Assessing gender roles in a changing landscape: diversified agro-pastoralism in drylands of West Pokot, Kenya. Retrieved on November 17, 2016 from: https://pastoralismjournal.springeropen.com/articles/10.1186/s13570-015-0039-4

17 West Pokot County Integrated Plan 2013-2017.

18 CARE international (2016). What Works for Women: Proven approaches for empowering women smallholders and achieving food security retrieved on November 17, 2016.

19 FAO-UN (2016). FAO assists Kenyan communities to diversify into Agriculture retrieved on November 17th, 2016 from: http://www.fao.org/africa/news/detail-news/en/c/419112/

20 Baringo county draft hazard atlas.Published jointly by Baringo County Government, National Drought Management Authority (NDMA) and United Nations Development Programme (UNDP).

21 Cheserek G.J, Omondi P. and Odenyo V.A.O (2012).Nature and Causes of Cattle Rustling among some Pastoral Communities in Kenya. Journal of Emerging Trends in Economics and Management Sciences (JETEMS) 3 (2): 173-179.

22 Schilling J., Opiyo F.E.O and Scheffran J. (2012).Raiding pastoral livelihoods: motives and effects of violent conflict in north-western Kenya. Pastoralism: Research, Policy and Practice 2012, 2:25.

23 Odwori, P. O., Nyangweso, P. M., &Odhiambo, M. O. (2013). Alleviating Food Insecurity and Landlessness ThroughPelis in Kenya. In 2013 AAAE Fourth International Conference, September 22-25, 2013, Hammamet, Tunisia (No. 161634).African Association of Agricultural Economists (AAAE).

24 Conflict Management and Disaster Risk Reduction: A case study of Kenya (2013). A partnership study between Tufts University, Kenya Red Cross and Nairobi Peace Initiative – Africa for USAID/OFDA.

25 Ombaka, D. M. (2015).Explaining Kenya's insecurity: The weak state, corruption, banditry and terrorism. International Journal of Liberal Arts and Social Science 3: 11-26.

26 Ruto P., Mohamud A. and Isabella M. (2004). Indigenous Democracy: Traditional Conflict Resolution Mechanisms Pokot, Turkana, Samburu and Marakwet

27 The normalized difference vegetation index (NDVI) is a simple graphical indicator that can be used to analyse remote sensing measurements, typically but not necessarily from a space platform and assess whether the target being observed contains live green vegetation or not.

28 Famine Early Warning Systems Network (FEWSNET) is a leading provider of early warning and analysis on food insecurity. Created by USAID in 1985 to help decision-makers plan for humanitarian crises, FEWS NET provides evidence-based analysis on 35 countries. The Implementing team members include NASA, NOAA, USDA, and USGS, along with Chemonics International Inc. and Kimetrica.

29 Baringo County Early Warning bulletins sourced from the NDMA website link below http://www.ndma.go.ke/index.php/component/jdownloads/category/8-baringo?Itemid=-1

30 Ruto P., Mohamud A. and Isabella M. (2004). Indigenous Democracy: Traditional Conflict Resolution Mechanisms Pokot, Turkana, Samburu and Marakwet

31 Teshome S (2012). Analysis of traditional drought early warning indicators in use in five villages of ElidaarWoreda in Ethiopia.A report by Afar Pastoralist Development Association (APDA).

32 Workshop on "Early Warning & Early Response Practice: Sharing the WANEP Experience" and Strategy Planning- Accra Ghana (2007).

33 Government of Kenya (2013). National Climate Change Action Plan 2013-2017.

34 Government of Kenya (2010). Agriculture Sector Development Strategy 2010-2020.

35 West Pokot first County Integrated Development Plan (GIDP) 2013-2017.

36 West Pokot climate communication Action plan, 2016.

37 West Pokot ASDSP Value chain analysis report (2014).

38 World Meteorological Organization- WMO (2016).Disaster Risk Reduction Programme.Retrieved on 2nd December, 2016 from http://public.wmo.int/en/programmes/disaster-risk-reduction-programme .

39 Rogers, D. and Tsirkunov, V. (2016).Implementing Hazard Early Warning Systems. Retrieved on 2nd December, 2016 from http://www.preventionweb.net/files/24259_implementingearlywarningsystems1108.pdf

40 Government of Kenya (2010). Agriculture Sector Development Strategy 2010-2020.

41 UNISDR (2016).The 2030 Agenda for Sustainable Development. Retrieved on 1st December from http://www.unisdr.org/we/advocate/sustainable-development

42 Cumiskey L. (2015). Case study: Flood early warning systems. Retrieved on 27th November, 2016 from http://www.un.org/waterforlifedecade/waterandsustainabledevelopment2015/pdf/Lydia_CumiskeyGDG.pdf

43 Shilenje, Z. W., &Ogwang, B. A. (2015).The role of Kenya meteorological service in weather early warning in Kenya.International Journal of Atmospheric Sciences, 2015.

44 Pearson, L. (2012). Early warning of disasters: Facts and figures. Retrieved on 1st December from http://www.scidev.net/global/communication/feature/early-warning-of-disasters-facts-and-figures-1.html

45 Twigg, J. (2003). Lessons from Disaster Preparedness. Notes for presentation to Workshop 3: It Pays to Prepare at International Conference on Climate Change and Disaster Preparedness, 26-28 June 2002, The Hague, Netherlands

46 Maingi, S. G. (2009). Emergencies and disasters in selected settlements in Kenya. Unpublished PhD thesis Nairobi: University of Nairobi

47 World Disasters Report –Reducing Risk (2002). International Federation of Red Cross and Red Crescent Societies.ISBN 92-9139-082-8.

48 World Disasters Report - Urban Risk (2010).International Federation of Red Cross and Red Crescent Societies. ISBN 978-92-9139-156-1

49 The Baringo County Draft Hazard Atlas, 2016

50 Government of Kenya (2009). Draft National Policy for Disaster Management in Kenya.

51 www.kas.de/kenia

52 Baringo County. Monthly NDMA Drought Early Warning Bulletins sourced from http://www.ndma.go.ke/index.php/component/jdownloads/category/8-baringo?Itemid=-1

53 Jason Mosley (2016). Early Warning Systems in Kenya: Linking development and drought resilience planning. A report to Konrad-Adenauer-Stiftung by Chatham House.

54 Andy Catley, John Burns, DawitAbebe and OmenoSuji (2014). Participatory Impact Assessment: A Design Guide. A publication by Feinstein International Center, Tufts University. Download at: http://fic.tufts.edu/publication-item/participatory-impact-assessment-a-design-guide/

55 The Baringo County Draft Hazard Atlas, 2016

56 Government of Kenya (2009). Draft National Policy for Disaster Management in Kenya.

57 www.kas.de/kenia

58 Baringo County. Monthly NDMA Drought Early Warning Bulletins sourced from http://www.ndma.go.ke/index.php/component/jdownloads/category/8-baringo?Itemid=-1

59 Jason Mosley (2016). Early Warning Systems in Kenya: Linking development and drought resilience planning. A report to Konrad-Adenauer-Stiftung by Chatham House.

60 Andy Catley, John Burns, DawitAbebe and OmenoSuji (2014). Participatory Impact Assessment: A Design Guide. A publication by Feinstein International Center, Tufts University. Download at: http://fic.tufts.edu/publication-item/participatory-impact-assessment-a-design-guide/