

Impact Of Community-Based Early Warning Systems As An Approach For Developing Resilience By Non-Governmental Organizations In Turkana County, Kenya

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Abstract: The study's objective was to determine how Non-Governmental Organizations have played a critical role in Turkana County's community resilience to climate-related disasters. Numerous non-governmental organizations have undertaken various programs to enhance community resilience, but the Community's capacity to endure disaster shocks has continued to dwindle. The study determined whether or not community resilience has been increased due to non-governmental organization (NGO) programs. The study addressed the following gaps: to determine the impact of Community Based Early Warning Systems as a strategy used by Non-Governmental Organizations in building community resilience; Two frameworks were examined in relation to the study's objective: the Sendai framework for disaster risk management and the Hyogo framework for action. The study used a descriptive survey to choose 380 families randomly from a target population of 38,173 households in Turkana Central Sub-County. Data collecting methods included household questionnaires, focus group discussions, and key informant interviews. The checklist for key informant interviews was distributed to Non-Governmental Organizations operating in Turkana Central Sub-County. The data were analyzed descriptively and inferentially. While descriptive statistics used frequency distributions, percentages, means, and standard deviations, inferential statistics used correlation and linear regression to determine the relationship between variables. According to the study's findings, the development of livelihood resilience has been supported by the installation of effective early warning systems, which have strengthened coping methods and even adaptive capacity. The study concluded that major improvements in the design and implementation of early warning systems were required. The report also advised that political will and commitment be shown in the design of laws, their enforcement and regulation, funding and policy, government-led response, rehabilitation, and recovery, and equipping communities through educated Community Contingency Planning. The report advocated the establishment of a diverse range of organizations operating at various levels of government to promote more coordinated and integrated catastrophe risk reduction efforts.

Keywords: Non-Governmental organization, Climate, Hazard, Warning systems, Community Based warning systems, resilience, community resilience

I. INTRODUCTION

Early warning systems are a critical component of community-based disaster risk management (Macherera & Chimbari, 2016). These systems offer the Community

relevant, topical information on environmental conditions to assess the level of risk and make informed decisions to take the most appropriate measures against such risks. Largely, the locals manage the community-based early warning system (CBEWS), thus empowering communities and promoting the

sustainability of such systems. Studies argue that the most appropriate warning systems include subsystems for detecting severe occurrences, managing hazard information, and public reaction to ensure the readiness of the Community to deal with the disaster when they arise. (Mileti, 1999). Studies on early warning systems indicate that these systems collect information, evaluate the data, map out various hazards, and issue the most appropriate warnings that can assist individuals in recognizing danger and mitigating any harm or loss caused by such hazards. The current body of research broadly categorizes early warning systems into two—the global and national early warning systems and community early warning systems.

II. GLOBAL AND NATIONAL EARLY WARNING SYSTEMS

The global and national early warning systems denote the global, national, and local capacities required to generate and disseminate timely and meaningful warnings at the global, national or local scale for organizations that are at risk of a hazard to enhance the areas disaster response preparedness (Macherera & Chimbari, 2016). The levels of this system are determined by the extent of the problems and the capacities of various levels to address them. Some of the most notable EWS have been developed in the agricultural sector, including USAID's Famine Early Warning System (FEWS), SADC Food Security Program, FAO global information and early warning systems on food and agriculture, FAO food insecurity and vulnerability information, and mapping system and World Food Program (WFP), Vulnerability Analysis and Mapping (VAM) (Brown & Brickley, 2012; Kajombo et al., 2014). All these systems are developed at a global level and communicated down to the regions and nations concerned until the warning gets to the affected population. In most instances, the local community does not get the warning unless they follow it closely on the news. However, these warning systems are necessary even when there is a disconnect between the Community and the current technologies. Thus, early warning systems must be designed to suit the population and local settings to be effective and useful.

Moreover, the warning systems are not static, considering that the world faces new threats globally (Glantz, 2009). As such, the warning systems are continuously becoming complex because of the environment and the constantly changing societies. According to the department of meteorological services, advanced technological innovations have come a long way in issuing warnings about extreme weather conditions. Nevertheless, the practices of the indigenous communities with respect to warning systems cannot be overlooked as they were effective even before the use and introduction of technology in early warning systems (Enock, 2013). At the core of any early warning system is that the state, media, and the affected people are advised to take action and be receptive to these warnings. Therefore, the effectiveness of an early warning system relies on the users' abilities to perceive the strength and the weaknesses as this will determine if the warning is accepted or not (Glantz,

2009). Factors like indigenous knowledge systems might have an adverse impact on the acceptance of early warning systems. Nonetheless, all types of early warning systems have to deal with this shortcoming. An early warning system developed with the involvement of communities is more effective and can go a long way in the identification and fully support the implementation of such systems. It should, however, be noted that not everyone in the Community will necessarily have the same level of understanding and appreciation of an early warning system.

III. COMMUNITY-BASED EARLY WARNING SYSTEMS

On the other hand, community-based warning systems are equally important in hazard preparedness at the local community levels. The most common Community based early warning system is the pastoral early warning system of 2006. Nevertheless, communities are under-informed about the operations of early warning systems, often resulting in the inefficacy of these systems in triggering the necessary response in the local community context. To address this gap, it is imperative to develop Community based early warning systems. Community-based early warning system. Furthermore, it is imperative to note that the community-based early warning system is not synonymous with the traditional warning system. However, the traditional early warning systems are part of the community-based warning system as they are formulated and implemented by the Community. The current body of research list community based early warning systems like the pastoral community-based early warning systems, floods, and landslide warning systems, multi-hazard early warning systems, avian influenza warning systems, and early warning system and mapping for an urban barangay (Gautam & Phaiju, 2013; Lassa et al., 2013).

Nonetheless, the body of research on Community based early warning systems indicates that most of these initiatives are taken up by outsiders and often include traditional knowledge (Macherera & Chimbari, 2016). The majority of the early warning systems are currently driven and run by Non-Governmental Organizations like CARE Philippines, Save the Children UK Ethiopia, Practical Action, Christian Aid Social Action Centre, World Vision, USAID, among many more. The existence of national and global warning systems has reduced the communities' vulnerabilities to hazards and risks considering their capabilities in terms of early warning systems. Evidence on Community based early warning systems argues that the objective of such systems is to transform at-risk communities into prepared disaster-resilient communities. Together with the national warning systems, the community warning systems complement each other to make the response to hazards more strategic in the sense that national resources can be channeled to the local community to address the potential risks and hazards as in most cases, the communities rely on traditional warning systems that might not be very effective.

IV. COMMUNITY-BASED WARNING SYSTEMS IN TURKANA

Turkana County faces several natural and human-made disasters, including drought, floods, landslides, earthquakes, stormy rains, strong winds, hailstorms, pest infestations, diseases outbreaks, fire, and traffic-related accidents (Mutu, 2019). Over the decades, the intensity, frequency, and severity of some of these disasters have steadily increased, triggered by climate change variability, urbanization, population growth, aridity, and environmental degradation. Disasters cause death, disrupt people's livelihoods, endanger human and food security, damage infrastructure, disrupt ecosystem functions, and hinder socio-economic growth and development. The county has experienced repeated episodes of droughts and floods that have affected the agriculture sector leading to massive livestock deaths and chronic food insecurity (Opiyo et al., 2015). Due to extensive resources allocated to respond to these disasters, little recovery times, and large economic losses, there have been increased poverty levels of rural and peri-urban households and reduced ability of the county government to invest in key social-economic sectors important to reducing poverty.

According to the Kenya National Human Development Report of 2014, Turkana County has a human poverty index (HPI) of 94 percent, contributing 1.3 percent to the national poverty. The population density distribution is dynamic owing to the pastoral livelihoods and nature of the Turkana people. The mortality rate is high; the infant mortality rate is 66 deaths for every 1000 live births compared to the national rate of about 52 in every 1000 live births in 2015. Besides, HIV/AIDS threatens the Turkana population (Lokaran, 2020). According to the Medical records, the prevalence rate was 6.9 percent in 2012. However, many deaths occur due to violent conflicts, diseases, and drought. Even though the humanitarian agencies and the county government have been implementing various projects and programs geared towards disaster risk reduction, poverty reduction, and improving food security, vulnerability to disaster risks remains high. The majority of the rural households make up the poor, and it is these poor households frequently get severely impacted by disasters. In addition, the frequent multiple and complex disasters often disrupt progress and destroy the hard-earned fruits of humanitarian and developmental interventions in the area. The productive sectors that contribute directly and indirectly to the local and county economy through revenue generation and wealth creation, such as pastoralism, fishing, agriculture, trade, tourism, and oil industry, have also been adversely affected by frequent disasters in the region (Johannes et al., 2015). While significant efforts have been made towards the building of resilience in the Community, it is imperative to evaluate the impact of community based warning system in Turkana County.

V. METHODOLOGY

The current study adopted a descriptive survey. Mugenda & Mugenda (1999) define the design as an approach to collecting that answers the questions why, how, and when. In

this study, the researcher has no control over how non-governmental organizations (NGOs) contribute to community resilience to climate-related disasters. The study targeted a population of 38,173 households within Turkana Central Sub-County, which has a population of 185,305 people, according to the 2019 KNBS Report. Additionally, NGOs and other stakeholders engaged in community resilience activities in Turkana Central Sub-County were targeted. The study had a sample frame of 380 households was calculated using the Mugenda formula, which states that 10% – 50% of the target population should be included in the sample frame. Based on NDMA Short rain and long rain reports, the villages of Namadak in Kalokol ward, Napetet in Lodwar township ward, Lorengelup in Kerio Delta ward, and Akatuman in Kerio Delta ward were eliminated. The population density of the location determined the sample size.

S/N	Location	Ward	Livelihood Zone	Prone Disaster	Number of HH	Number of HH Sampled
1	Namadak	Karakol	Pastoral	Drought	5,229	52
2	Appetit	Lodwar Township	Agro-pastoral	Flood	11,094	110
3	Napuu	Kanamkemer	Agro-pastoral	Flood	10,063	100
4	Akatuman	Kangatoha	Agro-pastoral	Drought	4,983	50
5	Lorengelup	Kerio Delta	Central Pastoral	Drought	6,804	68
Total					38,173	380

Source: Researcher (2021)

Table 1.0: Sample size

Additionally, the study employed both random and purposive sampling techniques. The sample frame for the study was determined using the Mugenda approach of 10% – 50% of the target population. A sample frame of 10% (10%) of 38,173 households was determined.

Study Population Unit	Target Population	Sampling Method	Sample Size
Households	38,173	Random	380
KIIs	2 X 5 = (10)	Purposive	10
FGD	5X2 = (10)	Purposive	10
Total			400

Source: Researcher (2021)

Table 2.0: Sampling Frame for the Various Categories of Respondents

VI. DATA COLLECTION AND ANALYSIS

The study collected data using interview schedules, a focus group discussion schedule, and a questionnaire. The three tools used in the study were complementary in terms of content acquisition, as some information may not be captured adequately by the questionnaire but can be adequately articulated in focused group discussions and key informant interviews. The data collected was subjected to both qualitative and quantitative analysis. Data generated through qualitative analysis from the interviews and focus group discussions were presented verbatim.

VII. RESULTS AND DISCUSSION

The study's findings confirmed that local families received training on Community Based Early Warning System. Moreover, the study's findings confirmed that warning information was regularly disseminated on a timely basis. The information system informed the local Community of the potential hazards and vulnerabilities. The respondents confirmed that the Community received announcements and messages about imminent hazards and worked on community mobilization to avert the risk. Furthermore, 61.4 percent of the study participant agreed that the development of effective early warning systems had helped livelihood resilience by increasing coping mechanisms and even adaptive capacity. Further, when interrogated whether an early warning system had been installed in a central location within the Community, many of the respondents disagreed, indicating that the warning systems had not been installed, confirming the lack of the systems in the area. Lastly, it was discovered that community members did not receive mobile SMS notifications about early warning system alerts (mean =2.90), as 23.9 percent of respondents disagreed, and 26.1 percent strongly disagreed. Many variances were small and thus had a negligible effect on mean values. These findings indicate that most Turkana central sub-county families are aware of and have received training on community-based early warning systems. The data indicated that community-based early warning systems influenced Turkana's central sub county's resilience to climate change disasters. According to the Community elder:

"We received community training on EWS from Child Fund and Mercy Corps whereby we could link indigenous knowledge such as reading intestines of goat, the shape of the moonrise, birds movement and connect with the conventional EWS knowledge perpetuated by NDMA."

The community elder later admitted

"I was taken to the Akicha radio station by Child fund and Mercy Corps on EWS session after the I received the training on EWS as an agent of change and speaker."

The schedule of key informant interviews (KIIs) revealed that communities had been informed on the connections between indigenous knowledge on EWS and conventional knowledge and measures to enhance community resilience. Additionally, the findings indicated that several critical pieces of information about EWS had been documented by organizations such as Child Fund and Mercy Corps and that information on EWS is spread via radio programs. Mercy Corps' program officer for resilience is admitting.

"Mercy Corps sponsored radio talk shows on EWS whereby it invited community members, NDMA Officials, and Meteorological Staff to talk to the community on impending occurrence of hazards and Early Warning System (EWS)."

The respondents stated that they had received EWS training from NGOs, participated in radio sessions about EWS, and connected indigenous knowledge to conventional knowledge, consistent with the findings. Lelemtum (2006) conducted research in West Pokot on indigenous early warning systems and practices. It was critical to connect the two types of EWS and broadcast through a local vernacular radio station. Additionally, it corresponds to the research on early warning systems and livelihood resilience. The study

discovered that developing effective Early Warning Systems can help increase livelihood resilience by bolstering coping mechanisms and even adaptive capacity.

VIII. CONCLUSION

The study's findings confirm that households in the surrounding area had been trained on community-based early warning systems, a technique used by non-governmental organizations to build community resilience. Additionally, the analysis revealed that the early warning system's information was released quarterly. Early warning systems were designed to provide at-risk communities with information on local hazards, community susceptibility, and immediate risk, as well as warning messages, capacity building, and mobilization to minimize risks. Additionally, the findings indicated that developing effective early warning systems aided in developing livelihood resilience by enhancing coping strategies and even adaptive capacity. Each Community had an early warning system established in the town's central location; the investigation was discovered. However, the study noted that community members did not receive mobile SMS to disseminate early warning system information.

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