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Examining the Strategies Used to Disseminate Information on Drought Management to Pastoralist Communities in the ASAL

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Abstract

Drought significantly impedes progress towards Sustainable Development Goals in Kenya's ASALs, particularly impacting pastoralist communities. This study investigated the strategies used to disseminate drought management information in these regions, identifying shortcomings in current practices. The research examined existing strategies, employing a mixed-method approach in Garissa County. The study surveyed pastoralists, KNDMA officers, and community leaders, utilizing questionnaires, interviews, and focus groups. The findings indicated that while traditional methods are used, pastoralists desire a more comprehensive approach incorporating technology, collaboration, and visual aids. Effective dissemination requires technology access, reliable early warning systems, impact evaluations, feedback mechanisms, and culturally relevant messaging. However, current strategies exhibit weaknesses, causing delays and hindering effective drought response. To address this, the study proposes an integrated, needs-based framework emphasizing technology, policy support, and a blend of scientific and indigenous knowledge. The recommended multi-faceted approach includes community meetings, radio, mobile technology, local networks, two-way communication, NGO partnerships, and continuous evaluation to empower pastoralists with timely information for better drought management and SDG attainment.

Keywords: *Strategies used to Disseminate Information, Drought Management, Pastoralist Communities*

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1. Introduction

Drought and inadequate information flow are significant barriers to poverty reduction in Kenya's ASALs, where pastoralist communities heavily rely on climate information for their livelihoods (Makala, 2012; Muhua & Waweru, 2017; Musimba et al., 2018; Orindi et al., 2007). The Kenyan government's ability to address drought hinges on the availability and

dissemination of relevant information, including both indigenous and modern sources (Mwangi, 2016). However, studies have identified severe issues with how county governments disseminate drought information, necessitating improved communication channels within early warning systems (Rai et al., 2020). Effective strategies involve two-way information flow, integrating research-based data with community-generated knowledge (Manei, 2013), and utilizing channels that minimize the impact of extreme weather events.

Current approaches to information dissemination in ASAL Kenya often adopt a top-down approach, with government institutions as primary sources (Omollo et al., 2018). While some government bodies have started incorporating bottom-up approaches to identify preferred community information channels (Ngugi et al., 2011; Recha & Bebe, 2017), the participation of pastoralists remains limited. Organizations like HSNP have introduced training and equipment for chiefs to disseminate information and manage grievances (Birch & Carter, 2023). There is a need to explore strategies that effectively communicate emergency results to pastoralists, potentially leveraging Traditional Ecological Knowledge (TEK) (Mwangi et al., 2022; Ratemo et al., 2020), and moving beyond reliance on methods like government websites that are inaccessible to many in the region (Awolala et al., 2022; Kimaru et al., 2023).

1.1 Problem Statement

Significant challenges exist in effective communication, including geographical isolation, lack of suitable infrastructure and technology, culturally insensitive communication techniques, and low literacy levels. These issues result in pastoralists receiving inaccurate, delayed, or skewed information, hindering their ability to prepare and respond to drought, thus increasing vulnerability and reliance on external aid. While drought management studies exist, few focus on information dissemination as a crucial link, particularly concerning contemporary realities and the role of indigenous knowledge. This study aims to address this gap by investigating information dissemination strategies for drought management in Garissa County, Kenya, seeking to enhance pastoralists' capacity to respond effectively to drought challenges by examining current strategies.

2. Literature Review

Various strategies are effective in disseminating information for drought management. These include incorporating user participation and employing succinct narratives and visualizations (Ward et al., 2021), emphasizing active two-way communication and leveraging social media for information exchange and decision-making (Tang et al., 2015). Providing a variety of information channels customized for agricultural decision-making is also crucial (Calvel et al., 2020). Furthermore, partnerships and technologies can enhance decision support and translate early warning systems into local action (Enenkel et al., 2015). For rural families affected by drought, timely, accessible, and relevant information is vital (Andelman et al., 2016), necessitating low-cost, reliable, and effective methods to deliver high-quality data on market conditions, disease outbreaks, and early warnings (Gesare et al., 2017).

Despite the recognition of effective dissemination techniques, there remains a lack of understanding regarding the specific information needs of pastoral communities and the most practical ways to gather and transmit this information to them and service providers in pastoral

areas (Gesare et al., 2017). Studies from various regions like Australia, China, Sub-Saharan Africa, the United States, and Europe have explored user requirements and perceptions regarding drought information provision (Mase & Prokopy, 2014; Nalau et al., 2017; Jones et al., 2015; Singh et al., 2018; Brewer et al., 2020; Damm et al., 2020; Kusunose et al., 2019; Soares et al., 2018). In Kenya, Owino (2020) suggested encouraging public-private partnerships to establish local media stations, while others have highlighted the importance of contextualizing seasonal predictions with local knowledge and involving communities in monitoring (Andersson et al., 2019). The use of mobile phones is also increasingly recognized as a tool for disseminating critical information to pastoralist communities (Asaka & Smucker, 2016; Djohy et al., 2017), although the effectiveness and trust associated with mobile-mediated information are still being explored.

3. Methodology

The study adopted a pragmatic philosophy and a mixed-methods approach with a correlation survey design, focusing on pastoralist communities in Garissa County, Kenya, as the target population. Sampling involved a multi-stage technique to select 600 pastoralist households and a census approach to include 12 key informants from the National Drought Management Authority. The study further describes the measures taken to ensure the validity and reliability of data collection instruments, including piloting in Wajir County. Data collection involved administering questionnaires to pastoralists, conducting semi-structured interviews with key informants, and facilitating FGDs with pastoralists, ensuring gender balance in the latter. Data analysis was conducted using descriptive and inferential statistics with Microsoft Excel and SPSS version 22, and qualitative data from interviews were transcribed and analyzed thematically.

4. Results and Discussion

4.1 Response Rate and Demographic Overview

The study achieved an acceptable overall response rate, with 64.1% of pastoralists returning questionnaires and 83.3% of NDMA staff participating in interviews. The demographic analysis of pastoralist respondents revealed a predominantly young population, with the largest segments aged 18-25 (32.2%) and 26-35 (33.0%). Gender representation was relatively balanced, though slightly skewed towards female respondents (53.7%). A significant proportion of pastoralists had low levels of formal education (64% uneducated), and the majority (83.9%) were livestock pastoralists. NDMA staff interviewed were qualified in their respective fields, with a mix of diploma, bachelor's, and master's degree holders, and most had considerable experience within the organization.

4.2 Strategies used to Disseminate Information on Drought Management to Pastoralist Communities in the ASAL

Respondents were asked to indicate their preferred sources and channels used to disseminate information for drought management, and the results are presented in Table 1.

Table 1: Strategies involved in disseminating information for drought management

S/No	Source Channels N=385 Channels	Frequency	Percentage
1	Mobile Phone (SMS mobile apps)	108	28
3	Pamphlets and brochures	8	2
4	Extension officers	19	5
5	Newspaper	8	2
6	Internet and WhatsApp	11	3
7	Radio	168	44
9	Television	26	6
10	Community meetings and indigenous forecasters	37	10
Total		**385**	**100**

The data on preferred information sources for drought management revealed varied reliance on different communication channels among the 385 respondents. The foregoing results show that 43.6% (168) relied on radio for drought updates, indicating its broad reach and effectiveness in delivering timely information. Mobile phones, particularly SMS and mobile apps, were also significant, with 28.1% (108) of respondents utilising them. This implied that there was a growing reliance on digital technology for real-time updates. In contrast, pamphlets, brochures, newspapers, and the internet had minimal appeal, cumulatively accounting for only 7.8%. It was also noted that Extension Officers and community meetings were moderately utilized at 4.9% and 9.6% respectively. However, these still played a lesser role compared to radio and mobile phones.

To validate the above findings, the qualitative information from the interviews of NADMA staff and the FGDs was analysed. Majority of the pastoralists in the FGDs said that drought information dissemination strategies affected the pastoralists' response to drought and overall management. Some of the verbatim responses from the interviews and FGDs were as follows.

> *"Without information on the onset of rains, then all the other information on drought is useless. They all need reliable information on when the rains begin to provide pasture for their animals". (FGDs 1)*

The aforementioned results are in support of the works done in China (Xu *et al.* 2016; Yoo *et al.*, 2016; Zhang *et al.*, 2014) and in Kenya (Ageyo & Muchunku, 2020; Cherotich *et al.*,2012), which showed that proper use of information dissemination channels could minimise future drought.

In another response from FGDs, a member lamented that:

> *"I do not usually receive any information regarding drought from the radio or any other ICT source. Perhaps nearly all information I receive on drought is communicated orally by my good friends….my neighbours". (FGDs 2)*

During interviews with key informants from the NDMA, it was recorded as follows:

> *"We provide drought information through a monthly bulletin". {NDMA staff 1}*

"We disseminate drought information through channels like emails, WhatsApp groups… and at some point, we used radio, which was very effective". {NDMA staff 3}

The aforementioned responses confirmed the presence of alternative methods of disseminating information about drought. A pastoralist claimed and emphasized the value of informal, oral communication derived from interpersonal interactions by stating that he had little interest in formal channels of information dissemination. On the other hand, the NDMA responses emphasized a deliberate, methodical approach by using radio and a monthly bulletin to notify people about drought. In contrast to pastoralists' casual, interpersonal approach, this was a more official way of disseminating knowledge frequently and broadly. To reach a wider audience, the NDMA adopted a formal, consistent communication style, as opposed to the pastoralist method, which relied on informal and closed networks.

The study considered the possibility of expanding the use of less popular channels to reach a wider audience. This also highlighted the significance of incorporating radio and mobile technology into drought management measures. Since radio and cell phones were the most common sources used to provide accurate and useful information about drought, using these platforms could greatly increase public awareness and responsiveness.

4.3 Availability of Drought Information Dissemination Channels Used by Pastoralists in Garissa County

When asked to indicate whether or not media channels used were available to them, 238 (62%) of the pastoralists said the media channels were available to them, while 146 (25%) said they were not. The study further tested the frequency of information use, and the findings are presented in Table 2.

Table 2: Frequency of information use

Extend	Frequency	Percentage
Weekly	17	4
Monthly	112	29
Quarterly	119	31
Semi annually	10	3
Annually	127	33
Total	**385**	**100**

The findings in Table 2 show that 127 (32.9%) pastoralists received drought information once a year, while 17 (4.6%) received it weekly. The findings further indicated that 119 (30.9%) pastoralists received drought information twice yearly, whereas 112 (29%) received it monthly. According to the results from the study, the type of information and some elements of discrepancies affected how frequently pastoralists received information or desired to receive it.

4.4 Evaluation of Information Strategies Used for Dissemination of Information on Drought in Garissa County

Respondents were asked to indicate the quality of information strategies used for the dissemination of information on drought in Garissa County. The researcher used a four-point Likert scale. The use of a four-point Likert scale (Poor, Average, Good, and Excellent) in Table 3 ensured clarity of responses by eliminating the neutral option, compelling respondents to take a definitive stance on the quality of information dissemination strategies. This approach simplified data analysis, making trends easier to interpret while also encouraging more differentiated responses, as it prevented participants from defaulting to a neutral choice. Additionally, it helped reduce social desirability bias, where respondents could have otherwise chosen a middle option to avoid giving overly negative or positive feedback. The results are presented in Table 3.

Table 3: Quality of information strategies for drought Dissemination of Information

Attribute	Poor	Average	Good	Excellent	Mean	Median
Accessibility	40	30	10	5	1.76	20.0
Timeliness	45	25	15	3	1.73	20.0
Reliability	40	30	10	5	1.76	20.0
Accuracy	30	35	10	5	1.88	20.0
Relevance	40	25	10	2	1.66	17.5
Format	42	28	15	3	1.76	21.5

Table 3 shows that several challenges were observed relating to the effectiveness of drought-related information dissemination. With a mean score of 1.76, respondents perceived the accessibility of information to be fairly low, implying that significant barriers existed in ensuring that users could easily obtain critical drought updates. Similarly, timeliness was seen as inadequate, with a mean score of 1.73, indicating that information could not be delivered quickly enough to facilitate prompt action. The reliability of the information also came into question, with a mean score of 1.76, pointing to inconsistencies in the information provided, which might have led to confusion or mistrust among users.

Additional concerns emerged around the accuracy and relevance of the information. A mean score of 1.88 for accuracy indicated that while the information could have been somewhat reliable, it still fell short of being sufficiently precise, which is essential for effective decision-making in drought management. The relevance of the information, with a mean score of 1.66, was also a significant issue, as the content could not always meet the specific needs or priorities of the affected communities. Finally, the format of the information, scoring 1.76, suggested that the way drought-related updates were presented may not have been optimal. This could have potentially hindered understanding and reduced the ability of users to act on the information. To reach a variety of audiences, the format could be improved by employing more comprehensible languages, using visual aids like infographics, or providing information in several formats, such as written, audio, and video.

4.5 Summary of the Study Findings

Radio is heavily favored by 43.6% of the respondents when it comes to providing timely updates. This was according to a survey of 385 respondents in response to their preferred information sources for managing droughts. Another significant factor noted was the use of mobile phones, especially through SMS and apps, which were used by 28% of respondents, indicating a trend toward digital communication. However, only 7.8% of respondents were drawn to conventional media channels such as newspapers, brochures, pamphlets, and the internet. These channels were quite ineffective, as per the responses. Radio and mobile platforms were still the most prominent means compared to extension officers and community gatherings, which were used by 4.9% and 9.6% of the respondents, respectively. Furthermore, through semi-structured questionnaires, in-depth interviews, and focus group findings, participants expressed a mix of reliance on informal networks and organised communication strategies for disseminating drought-related updates to the pastoralists in ASAL Kenya.

5. Conclusion

The study concludes that while various strategies are employed to disseminate drought management information to pastoralist communities in the ASALs of Kenya, radio and mobile phones are the most utilized and preferred channels. However, the reliance on informal networks alongside organized methods suggests a need for a more integrated and effective approach. Furthermore, the limited reach of traditional media and the internet, coupled with potential issues in the availability and frequency of information, indicates that current dissemination strategies may not be fully meeting the needs of these communities for timely and accessible drought-related updates.

6. Recommendations

1. **Strengthen and Leverage Radio and Mobile Phone Channels:** Given their high usage and preference among pastoralists, efforts should be focused on optimizing the delivery of drought information through radio broadcasts, including local language programming, and mobile phone technologies, such as SMS alerts and mobile applications.
2. **Integrate Informal and Formal Communication Networks:** Recognizing the importance of informal networks, strategies should be developed to effectively integrate them with formal dissemination channels. This could involve training community leaders and trusted individuals to act as information intermediaries, bridging the gap between official information and community understanding.
3. **Improve Information Accessibility and Frequency:** Assess and address the barriers hindering access to drought information and work to increase the frequency of relevant updates, particularly in the lead-up to and during drought periods. This may involve tailoring the timing of broadcasts and messages to align with pastoralist activity cycles.
4. **Enhance the Quality and Format of Information:** Focus on improving the clarity, relevance, and format of drought information to ensure it is easily understood and actionable by a population with varying levels of literacy and access to technology.

Utilizing visual aids, simplified language, and local dialects can significantly enhance comprehension.

5. **Invest in Infrastructure and Digital Literacy:** To broaden the reach of digital channels, investments in infrastructure in ASAL regions and programs to improve digital literacy among pastoralist communities, particularly women and older individuals, are crucial.
6. **Conduct Further Research on Information Needs:** Future research should delve deeper into the specific information needs of different segments within the pastoralist community, considering factors like age, gender, and livelihood activities, to tailor dissemination strategies more effectively.

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