

## Characterising access to climate information and services by the vulnerable groups in semi-arid Kenya

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### Abstract

This study characterised the channels through which the vulnerable people in a semi arid area of Kenya access climate information and services from data collected from randomly selected sample in cross sectional survey using structured questionnaire. Over 70% of both women and the elderly representing vulnerable people perceived change in rainfall, drought, floods, human and livestock diseases to have been “severe” to “very severe” over the last five years. Majority of women (88.5%) preferred radio while the elderly (83%) preferred indigenous knowledge to access climate information and services. Women consistently rated radio higher ( $P<0.05$ ) than the elderly for delivering reliable information, explaining details and use of local language understood to them. However, Principal Component Analysis (PCA) indicated that comprehensive informing on climatic hazards and support services for adaptation to changing climate is from extension service unlike the other channels which delivered information only on climatic hazards. The study concluded that combination of extension agents, radio and local administration would be more effective for disseminating climate information and services to vulnerable people in marginal areas. Capacity building for extension service is needed in interpretation of weather data to enable them effectively disseminate climate information and services to vulnerable people of arid and semi-arid environments.

Key words: Climate information, dissemination, vulnerable groups, marginal areas

### Résumé

Cette étude a fait la caractérisation des canaux par lesquels les personnes vulnérables dans une zone semi-aride du Kenya accèdent à l'information climatique et aux services, à partir de données recueillies auprès de l'échantillon sélectionné au hasard dans l'enquête de section transversale, en utilisant le questionnaire structuré. Plus de 70% des femmes et des personnes âgées qui représentent les personnes vulnérables

ont perçu des changements lors des précipitations, de la sécheresse, des inondations, des maladies du bétail et des humains, ayant été «sévère» à «très grave», au cours des cinq dernières années. La majorité des femmes (88,5%) préfèrent la radio tandis que les personnes âgées (83%) préfèrent des connaissances indigènes pour accéder aux informations et aux services climatologiques. Les femmes utilisent régulièrement la radio d'une manière supérieure ( $P < 0,05$ ) que les personnes âgées pour fournir des informations fiables, en expliquant des détails et en utilisant la langue locale comprise par eux. Cependant, l'Analyse Composantes Principales (PCA) a indiqué que l'information complète sur les risques climatiques et les services de soutien pour l'adaptation aux changements climatiques est de service de vulgarisation, à la différence des autres chaînes qui ont livré des informations que sur les aléas climatiques. L'étude a conclu que la combinaison des agents de vulgarisation, de la radio et de l'administration locale serait plus efficace pour la diffusion d'informations et de services climatologiques pour les personnes vulnérables dans les zones marginales. Le renforcement des capacités des services de vulgarisation est nécessaire dans l'interprétation des données météorologiques afin de leur permettre de diffuser efficacement l'information climatique et des services aux personnes vulnérables des milieux arides et semi-arides.

Mots clés: information sur le climat, la diffusion, les groupes vulnérables, les zones marginales

## **Background**

Women and the elderly living in semi-arid environments of Kenya are vulnerable to the frequent exposure to impacts of changing climate and need to access climate information and services to build their adaptive capacity. They are however yet to experience the full benefits of climate research, information and services because information sharing is limited and may be worse in semi-arid environments due to poverty, lack of infrastructure and illiteracy factors. In Kenya, researchers, meteorological departments, development agencies and indigenous knowledge systems disseminate climate information and services through mass media, print media, electronic media, and contact with informed people. But whether vulnerable people, especially women and the elderly in semi arid areas effectively access climate information and services is unknown (Archer, 2003). The channels used have to be accessible and with user-friendly attributes such as timeliness, accuracy, reliability, ease of use, depth of content and language used.

This study characterised the channels through which the vulnerable people in a semi arid area of Kenya access climate information and services. Data were collected from a randomly selected sample in cross sectional survey using structured questionnaire.

### Literature Summary

Climate change is associated with increase in temperature and heat stress, more frequent droughts and intense flooding, windstorms and disease outbreaks. Projections are that these climatic hazards will have greatest impact on livelihoods in semi-arid environments of sub Saharan Africa (Thornton *et al.*, 2006; IPCC, 2007). More than 70% of people living in the semi-arid areas are highly dependent on climate sensitive natural resources and agriculture for their livelihoods (Siri *et al.*, 2008). They are frequently exposed to climatic hazards which lead to frequent famines and poverty. These people have to compete for scarce natural resources, which contribute to the area being ethnic-conflict-prone (Mango *et al.*, 2004).

### Study Description

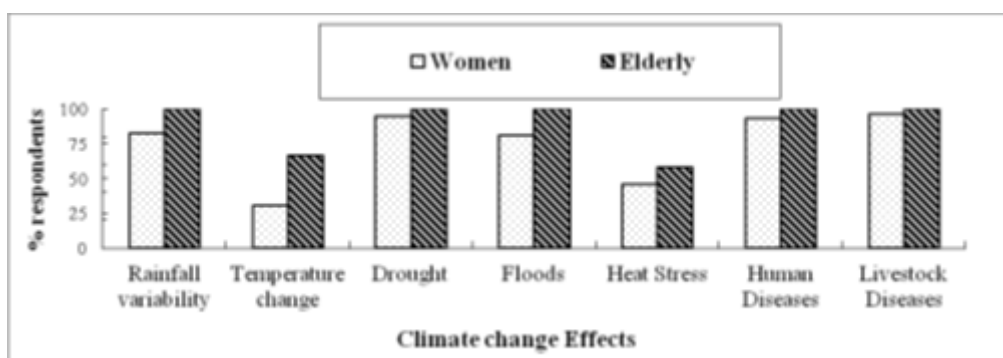
Data required was obtained in a cross-sectional survey in which simple random sampling technique was applied to obtain a sample of representative vulnerable women and the elderly. Women sampled were those within the age group of 24 to 60 years old. They were considered vulnerable because they were married and shouldered household chores and were providing food for the family under impacts of climatic hazards. The elderly were both males and females aged at least 65 years old and were considered vulnerable because of old age yet exposed to climatic hazards. The local administration chiefs and agencies involved in food assistance programme within the area facilitated identification of the individual vulnerable women and the elderly people within their administrative areas.

A structured questionnaire was administered to women and the elderly respondents to obtain data on their experiences in the past five years about impacts of climate change, dissemination channels through which they accessed climate change information and services, their preferences for each of the channels and user-friendly attributes of those channels to them. For each dissemination channel accessed, respondents rated on a Likert scale of 1 to 5 (1 = low to 5 = high) the climate information and services accessed, preferences and user-friendly attributes.

For each dissemination channel, Principal Component Analysis (PCA) was performed on type of climate information and services often accessed. The Likert scale measures of preferences attached to specific attribute of a dissemination channel were subjected to Kruskal Wallis test and where differences were detected, Mann U Whitney test was applied for pairwise comparisons.

### Research Application

Over 70% of both women and the elderly perceived change in rainfall, drought, floods, human and livestock diseases to have been “severe” to “very severe” over the last five years (Fig. 1). PCA application (Table 1) extracted four PCs accounted for 62.35% of the total variance of which PC1 explained more than half (38.91%). The largest contribution was from climate information and services accessed on drought, floods, diseases, early warning signals, veterinary and medical services, food aid and relocation of vulnerable people to safer places. The loadings indicate that through extension service, vulnerable people access comprehensive information on climatic hazards and support services. Results suggest that extension service is very effective in enabling vulnerable people access climate information and services necessary for building adaptation.



**Figure 1.** Perception of the vulnerable people about impacts of climate change as having been ‘severe’ to ‘very severe’ in the last five years.

Results in Table 2 show that radio was preferred by a large majority of women (88.5%) while indigenous knowledge was preferred by a large majority of the elderly (83%). Table 3 demonstrate that the elderly consistently rated radio lower than ( $P < 0.05$ ) women for attributes related to information reliability, detail and language used, indicating that different channels are necessary to reach women and the elderly.

**Table 1. Rotated correlation coefficients factor patterns for extension services.**

Climate information and services variables	Factor loadings			
	PC1	PC2	PC3	PC4
Climate-related human diseases	0.86			
Climate-related livestock diseases	0.83			
Adaptation technologies	0.81			
Floods	0.71			
Early warning signals	0.68			
Drought	0.67			
Relocation to safer places	0.64			
Veterinary services	0.64			
Human health services	0.58			
Food aid	0.46			
Heat stress		0.85		
Windstorm		0.82		
Rainfall variability		0.57		
Weather forecast			0.69	
Temperature change			0.01	
Financial support				0.81
Variance explained (62.35%)	38.91	9.39	7.42	6.62

**Table 2. Preferred dissemination pathways by the vulnerable groups.**

Dissemination pathway	Vulnerable group	Sample (n)	Preference rating (%)		Chi square statistics
			Often preferred	Most preferred	
Radio	Women	154	24.0	68.8	$\chi^2 = 72.81$ **
	Elderly	24	41.7	4.2	
Local Administration	Women	154	63.7	24.7	$\chi^2 = 31.58$ **
	Elderly	24	58.3	37.5	
Indigenous Knowledge	Women	154	59.1	32.5	$\chi^2 = 1.83$ **
	Elderly	24	16.7	83.3	
Extension Agents	Women	154	85.0	5.5	$\chi^2 = 1.77$ **
	Elderly	24	58.3	41.7	

\*\* Significant at P = 0.00.

**Table 3. Mean ratings for user-friendly attributes (1 = very poor 5 = excellent) of the dissemination Channels by vulnerable people.**

Channels	Group	Cost	Timeliness	Detailed	Reliability	Language
Radio	Women	3.43 ± 0.68 <sup>a</sup>	2.74±0.61 <sup>a</sup>	2.88 ± 0.62 <sup>a</sup>	2.66 ± 0.63 <sup>a</sup>	4.03 ± 0.51 <sup>a</sup>
	Elderly	3.17 ± 0.38 <sup>a</sup>	2.50±0.51 <sup>a</sup>	2.33 ± 0.51 <sup>b</sup>	2.21 ± 0.51 <sup>b</sup>	3.17 ± 0.38 <sup>b</sup>
Extension	Women	3.09 ± 0.97 <sup>a</sup>	2.73 ±0.61 <sup>a</sup>	3.07 ± 0.53 <sup>a</sup>	2.75 ± 0.56 <sup>a</sup>	3.33 ± 0.53 <sup>a</sup>
	Elderly	3.46 ± 0.51 <sup>a</sup>	2.20 ±0.68 <sup>a</sup>	3.00 ± 0.58 <sup>a</sup>	2.00 ± 0.59 <sup>a</sup>	3.67 ± 0.48 <sup>a</sup>
Local Administration	Women	3.97 ± 0.47 <sup>a</sup>	3.81 ±0.44 <sup>a</sup>	4.04 ± 0.61 <sup>a</sup>	3.99 ± 0.67 <sup>a</sup>	4.62 ± 0.58 <sup>a</sup>
	Elderly	3.79 ± 0.51 <sup>a</sup>	3.67 ±0.48 <sup>a</sup>	3.83 ± 0.38 <sup>a</sup>	3.79 ± 0.42 <sup>a</sup>	4.58 ± 0.50 <sup>a</sup>
Indigenous knowledge	Women	3.71 ± 0.78 <sup>a</sup>	3.64 ±0.51 <sup>a</sup>	3.96 ± 0.52 <sup>a</sup>	3.77± 0.59 <sup>a</sup>	4.56 ± 0.58 <sup>a</sup>
	Elderly	3.75 ± 0.68 <sup>a</sup>	3.67± 0.36 <sup>a</sup>	4.21 ± 0.51 <sup>a</sup>	4.25 ± 0.61 <sup>a</sup>	4.39 ± 0.41 <sup>a</sup>

<sup>ab</sup> = means with different letter superscripts in a column differ significantly at  $\alpha = 0.05$ .

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