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Communication and Use of Climate Information among Rural Women Farmers in Kondoa District, Tanzania

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Abstract

This study examined communication and the reported use of climate information among rural women farmers in Kondoa District, Tanzania. A cross-sectional survey of 165 women in the Bereko and Kwadelo wards was supplemented by focus group discussions. We analysed quantitative data using descriptive statistics and examined qualitative material through content analysis. The reported information covered rainfall onset and cessation, drought, floods, and adaptation strategies. Drought accounted for 153 of 362 information selections, while adaptation strategies accounted for 49 selections. Radio was the most frequently reported communication channel, followed by extension officers and television. Of the 164 women who rated access difficulties, 113 reported great difficulty and 44 reported moderate difficulty. The reported uses of information were dominated by planting drought-tolerant crops and planting at recommended times. These findings describe women's experiences and reported practices; they do not establish the effectiveness of communication channels or the effects of information on yields. The study supports combining accessible communication channels with practical agricultural advice and opportunities for women to ask questions. Interpretation of respondent percentages remains subject to confirmation of the item-specific denominators.

1.0 Introduction

Rain-fed farming requires decisions about planting, crop selection, and managing rainfall uncertainty. Research in central Tanzania has examined farmers' perceptions of climatic variability and agricultural adaptation, illustrating the relevance of locally appropriate responses to rainfall risks (Lema & Majule, 2009). Information about expected conditions can contribute to agricultural planning, but its practical value depends on whether farmers receive it, understand it, and can act on it.

This study uses climate information as an umbrella term for the information categories recorded in the survey: rainfall onset and cessation, drought and flood occurrence, and related adaptation advice. The available questionnaire results do not identify the forecast lead times or distinguish daily weather forecasts from seasonal outlooks. Consequently, the study does not evaluate short-term forecast accuracy, long-term climate projections, or whether climate change caused particular events. It focuses on how information is communicated and used in agriculture in relation to rainfall variability and associated risks.

Women's access to information must be considered alongside the resources and opportunities available for agricultural decision-making. A regional assessment identified gender-related constraints on agricultural productivity and access to productive resources in Africa (World Bank & ONE Campaign, 2014). Such evidence provides a reason to examine women's experiences locally, but it does not demonstrate that all women in Kondoa receive information through men. That relationship requires direct evidence about household communication and control of resources.

Communication and use are related but distinct stages. The channel through which information is received does not, by itself, show that the message is timely, understandable, trusted, or useful. Research on participatory forecast dissemination in Burkina Faso considered the process from access to assessment, highlighting how recipients engage with information rather than simply whether a message reaches them (Roncoli et al., 2009). The present study therefore describes both communication channels and reported uses without treating channel frequency as a measure of effectiveness.

The study aimed to examine the communication and reported use of climate information among rural women farmers in Bereko and Kwadelo wards. Specifically, it described the types of information women reported receiving, the channels and access difficulties, and the agricultural practices they reported using in response. These objectives provide a consistent focus for the descriptive survey and accompanying discussions.

2.0 Research Methodology

Study setting and design

The study was conducted in Kondoa District in Dodoma Region, Tanzania. Agriculture and rainfall variability are relevant features of the district's geography, with differences between higher- and lower-altitude areas (Hamisi, 2019). Bereko and Kwadelo wards were purposively selected to represent the highland and lowland settings, respectively, and to reflect differences in agricultural and geographical conditions.

A cross-sectional design was used. The study conducted structured interviews with 165 women engaged in agriculture. The available study record identifies the purposive selection of wards but does not describe the procedure used to select individual respondents.

Data collection

Structured questionnaires collected information about respondents' characteristics, the types and sources of climate information, perceived access difficulties, and reported agricultural uses. We held two focus group discussions in each ward, with five to seven women per group. Two extension officers also participated in discussions.

Data analysis

Quantitative data were analysed using descriptive statistics in IBM SPSS Statistics, Version 25. Qualitative material was analysed through content analysis. Discussion accounts illustrated respondents' experiences of communication and information use. For information types and communication channels, the tables distinguish the percentage of all selections from the percentage of respondents. Respondents could report more than one category, as indicated by totals exceeding the survey sample. Respondent bases of 162 for information types and 163 for channels are inferred from the original frequencies and percentages and require confirmation against the dataset. Access ratings total 164, while reported uses total 162. These differences are not interpreted as confirmed nonresponse because the reasons for the varying bases are undocumented. No inferential tests or causal estimates were reported.

3.0 Results and Discussion

Respondent characteristics

The mean respondent age was 46.8 years. Without an age distribution, this mean does not establish the proportion in any particular age group. Primary education was the most common education category, reported by 106 women (64.2%). Most respondents were married (119 women; 72.1%). These characteristics describe the sample; they do not establish women's share of agricultural labour or the extent of household responsibilities.

Table 1: Education and marital status of respondents

Characteristic	n	%
Education level		
Informal education	40	24.2
Primary education	106	64.2
Did not complete primary education	3	1.8
Secondary education	10	6.1
Did not complete secondary education	2	1.2
College or university	4	2.4

Characteristic	n	%
Marital status		
Single	5	3.0
Married	119	72.1
Widowed	29	17.6
Divorced	12	7.3

Types of climate information

Drought was the most frequently reported information category, with 153 selections (Table 2). Rainfall onset was mentioned 84 times and cessation 61 times. Together, drought, floods, and rainfall timing accounted for 313 of 362 selections (86.5%), while adaptation strategies accounted for 49 selections (13.5%). These are shares of information selections, not the proportions of women who received risk information or adaptation advice. Based on the inferred base of 162 respondents, 30.2% of women reported receiving adaptation advice.

Table 2: Types of information reported (multiple response)

Information type	**n**	**Selections %**	**Respondents %**
Rainfall onset	84	23.2	51.9
Rainfall cessation	61	16.9	37.7
Drought occurrence	153	42.3	94.4
Flood occurrence	15	4.1	9.3
Adaptation strategies	49	13.5	30.2
Total selections	362	100.0	—

The distribution suggests Messages about rainfall conditions and hazards were mentioned more frequently than messages explicitly classified as adaptation strategies. It does not quantify broadcast volume or assess the quality of the advice received. The categories may also overlap conceptually: information about rainfall onset can inform an adaptation decision even if it was not coded as adaptation advice. Any recommendation to expand practical advice should therefore consider both message content and the questionnaire's classification of that content.

Communication channels

Radio was the most frequently reported channel, with 84 mentions, followed by extension officers (75) and television (66) (Table 3). 50 respondents mentioned public meetings. Mobile phones and newspapers were reported less frequently. These counts indicate reported channel use; they do not

rank preference, reliability, accessibility, or effectiveness. The study did not establish whether women personally owned the devices through which they received information.

In Kwadela, a focus group participant described receiving climate information from radio stations and using it to prepare fields and purchase seeds. A participant in Bereko described village meetings and seminars in which an extension officer discussed climatic conditions and seed choices, with occasional text messages about delayed or limited rainfall. These accounts show how broadcast information and interpersonal advice can support planning. They do not establish how often these services reached all respondents or whether the advice was correct.

Table 3: Channels used to receive climate information

Channel	n	Selections %	Respondents %
Radio	84	27.1	51.5
Public meetings	50	16.1	30.7
Mobile phone	14	4.5	8.6
Television	66	21.3	40.5
Newspapers	2	0.6	1.2
Extension officers	75	24.2	46.0
Other channels	19	6.1	11.7
Total selections	310	100.0	—

The discussions also included concerns about insufficient agricultural radio programming and limited extension coverage. In Kwadelo, participants described local forecasting based on observations of plants and animals and expressed concern when expected conditions did not occur. These statements record perceptions of service adequacy and trust. The study did not compare local forecasts with observed rainfall, so these accounts cannot assess predictive accuracy. Likewise, the low frequency of reported mobile-phone use cannot be attributed to subscription programmes or changes in phone ownership without supporting data.

Access difficulties and household receipt

Among the 164 respondents whose access ratings were tabulated, 113 reported great difficulty, and 44 reported moderate difficulty (Table 4). Together, these categories represented 95.7% of the tabulated responses. One woman reported low difficulty and six reported no difficulty. The ratings show perceived barriers despite the availability of several channels, but the survey results do not identify which specific barriers account for the pattern.

Table 4: Reported difficulty accessing climate information

Access difficulty	n	%
High	113	68.9
Moderate	44	26.8
Low	1	0.6
None	6	3.7
Total	164	100.0

The manuscript also reports women's perceptions of who received information first within households: men, 45.5%; women, 32.1%; and both, 22.4%. The underlying counts and denominator are not supplied. These percentages should therefore be treated as provisional descriptive results. They reflect perceived first receipt, not measured differences in communication speed or independently observed access between men and women.

The household pattern is a reason to investigate how messages are shared, but it does not demonstrate that men control radios, phones, or televisions. Establishing control would require questions about ownership, decision-making, listening opportunities, and information sharing.

Reported agricultural uses

Planting drought-tolerant crops was the most commonly tabulated use of information, reported by 107 women (66.0%). Planting at recommended times was reported by 49 women (30.2%). Food storage and avoiding flood-prone areas were less frequently recorded (Table 5).

Table 5: Reported uses of climate information

Reported use	n	%
Planting at recommended times	49	30.2
Planting drought-tolerant crops	107	66.0
Food storage	5	3.1
Avoiding flood-prone areas	1	0.6
Total	162	100.0

Participants' accounts connected information with field preparation and seed selection, consistent with the types of decisions recorded in the survey. Work on maize growers in Tanzania also examines farmers' perceptions of adaptation strategies, providing a relevant comparison while remaining distinct from measured agronomic effectiveness (Shabani & Pauline, 2023).

Respondents identified sorghum and pearl millet as examples of crops planted in response to drought information. The study did not evaluate particular varieties or their performance. Legume cultivation should not automatically be classified as drought tolerance; any such interpretation requires specifying the crop, variety, growing conditions, and purpose. Similarly, the low count for food storage does not establish that respondents never stored food; it may reflect the question or coding procedure.

4.0 Conclusion and Recommendations

Women surveyed in Bereko and Kwadelo reported receiving information about rainfall timing, drought, floods, and adaptation through several channels. Radio and extension officers were the most frequently mentioned channels, more selections related to hazards and rainfall timing than to adaptation advice. Reported agricultural uses focused on drought-tolerant crop planting and recommended planting times, while most women who rated access reported great or moderate difficulty.

Communication services should combine accessible dissemination with practical advice that women can discuss and apply to local agricultural decisions. Radio programmes, village meetings, and extension contacts offer possible routes because respondents already reported using them. Service providers should consult women about suitable meeting and broadcast times, preferred languages, and opportunities to ask questions. These are recommendations for service design rather than effects demonstrated by the survey.

Extension planning should assess staffing and coverage alongside women's reported difficulties, rather than infer the required number of officers from channel counts alone. Further research should document message timing, understanding, trust, and the resources needed to act on advice. A prospective design linking information receipt with subsequent decisions and outcomes would allow a stronger assessment of usefulness than the current descriptive evidence.

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