Effects of Communication Barriers on Adoption of Climate Smart Agriculture Technologies in Kenya: A case of Agro-pastoralists in West Pokot County

Abstract

Over the last two decades, agricultural researchers have been developing technology-based systems to aid farmers on various aspects of farming. However, information about these agricultural research technologies have not been effectively disseminated to farmers, thus, low uptake of agricultural technologies among farmers. In Kenya, one of the major factors identified to contribute to low uptake of agricultural technologies among farmers is communication barriers among agricultural researchers, policy makers, value chain actors and farmers concerning the availability, applicability, and how to adopt the agricultural technologies for high production. The general objective of this study therefore was to explore how barriers of communication influenced the uptake of climate smart technologies among farmers in West Pokot County, Kenya. The study employed a Pragmatism approach, and specifically sequential QUAN→QUAL mixed method. The target population of the study looked at the entire group of objects having common observable characteristics and population that tends to have a wide geographical spread but not the total or universal population. The population sample was therefore based on practice, the expense of data collection and the need to have sufficient statistical power, precision level, the level of confidence of risk, and the variability degree in the attributes being measured. This sample size of farmers from West Pokot who participated in this study therefore were 494 farmers and 29 selected key informants from various agricultural institutions. Procedures of sampling were used at a characteristic level of a material specification or task list. Cluster random sampling and purposive sampling methods were used to select the respondents for the study. Farmers were grouped into four clusters based on the four Sub-Counties of West Pokot County. The selected key informants were assumed to have adequate e xperience in matters communication of agricultural information towards successful uptake of climate smart agriculture in West Pokot County. The administration of questions guided by questionnaires through online data kit app and conducting of in-depth interviews guides. Data collected through questionnaires was quantitative (closed-ended) with a few qualitative (open-ended) questions. One of the results showed that major barriers are language barrier, poor road network and poor telecommunications infrastructure.

Agriculture sector is vital in eradication of extreme poverty and hunger, and supports livelihoods of close to 1.5 billion people worldwide living in Agro pastoralists areas (World Bank, 2018). Despite its vital importance, the sector is highly sensitive and susceptible to climate change and variability (Perret, 2006; Fischer et al., 2005; Van de Steeg et al., 2009; Schlenker & Lobell,

2010), and Agro pastoralists farmers are disproportionately affected, as a result of poverty, high dependency on natural resources and inadequate capability to adopt new livelihood strategies (Osbahr & Viner, 2006).

Climate smart agriculture are among the long-term agricultural-based technologies that have been in existence for over a decade. They are designed and developed to enhance sustainable agricultural development; in particular, promoting climate smart agriculture especially in Agro pastoralists. Further, climate smart technologies seek to spearhead sustainable agricultural development by addressing food security and climate challenges (Ministry of Agriculture, Livestock and Fisheries, 2017).

There are several changes in agricultural practices that have been difficult to implement because the new farming practices often bring unknown risk to the agricultural industry, which already deals with many uncertainties, including pest pressures, weather variability, and the influence of local and international markets. This implies that farmers must trust and adopt the new agricultural practices and technologies, which are being developed by the agricultural researchers/scientists. Building this trust with farmers requires a personal relationship and understanding of the challenges that each farmer faces (Coquil *et al*, 2018). This can be achieved through effective communication in dissemination of science information between the agricultural scientists and farmers/citizens/stakeholders in the agricultural sector.

Communication of agricultural research information can be described as the participatory process where information and knowledge that is beneficial for development is exchanged between farmers and information providers either from person to person or through media channels. Rabin, Brownson, Haire-Joshu, Kreuter and Weaver (2008) stated that it is an active and targeted approach of sharing information or knowledge via determined channels using planned strategies to a specific audience. Through sharing of information, the rate of adoption and implementation of innovation is accelerated.

Agricultural communication is critical and includes exchanging information between farmers to farmers or even with experts or researchers (Maina, 2015). Sustainable development in the agricultural sector depends on the generation of appropriate technologies and the creation of an effective communication strategy for disseminating recommended techniques to end-users and eliminating the barriers that might hinder communication. In Kenya, there are numerous communication approaches to farmers, including individual visits to the farmers and cooperative extension. The change in information dissemination is an intervention to ensure knowledge and information on technologies, methods and practices are put into the proper use by farmers (Maina,

2015). However, there still exists a communication barrier between scientists/researchers and end-user stakeholders, thereby slowing the adoption of valuable technologies, innovations, and futuristic agricultural practices (Lee, 2017). This is mainly due to changing dynamics of agricultural research and the ever-increasing societal demands for understanding the research

implications, which has ignited a strong need for enhanced communication for engaging a wide spectrum of stakeholders (Gatobu, Omboto & Mining, 2020).

Communication barrier has been mentioned by communication researchers as the key challenge faced by researchers and scientists in communicating agricultural information to farmers. A study by Mubofu and Elia (2017) in Tanzania, found out that barriers to farmers' access to agricultural research information were; inadequate numbers of extension officers, inadequate funding, inadequate sources of information, no availability of electricity, political interference and the absence of information centers. Ogola (2015) conducted a study to establish the challenges watermelon farmers in Yimbo East Ward experience while accessing the information. The study found challenges that farmers experience while accessing information were mainly costs of acquiring data and lack of feedback. Lwoga, Stilwell and Ngulube (2011) found that farmers 'Illiteracy level posed a challenge to the dissemination and use of agricultural research information in Tanzania. Isaya (2015) conducted a research in Tanzania on how information was disseminated among women farmers in Hai and Kilosa districts. The study results revealed that farmers in the study area faced challenges such as inadequate knowledge on how to apply the information acquired from extension officers and researchers, lack of credit to purchase farm inputs, improved seeds and chemical fertilizers. Additionally, Mokotjo and Kalusopa (2010) in their study on the challenges faced in agriculture on information dissemination they found that language barrier and misinterpretation of information may also affect how famers use the information they have received.

In Kenya, one of the major factors that is highly contributing to low uptake of agricultural technologies among farmers is communication barrier between agricultural researchers/officers, policy makers, value chain actors and farmers concerning the availability, applicability, and how to use the agricultural technologies. Jan, Sultan and Ali (2011) posited that communication

influences change and progress in modern agriculture. Subsequently, GSMA (2015) noted that one of the problems hindering the potential growth of the agricultural sector in Kenya is communication barriers on communicating to farmers about available modern technologies and how to use them to improve agricultural productivity. This implies that in the 21st century, still farmers lack access to critical services such as relevant, actionable and timely agricultural information needed to improve productivity due to communication barriers.

Pastoralism often refers to extensive husbandry of herds of different species (cattle, sheep, goats, camels, and equines) requiring periodic migration to access pasture. A commonly used definition in literature is that pastoralist households are those in which at least 50% of household gross revenue (including income and consumption) comes from livestock or livestock-related activities (OXFAM 2008: Swift 1998). Agro-pastoralism describes the coexistence of both agricultural and grazing activities, although there may be different degrees of integration of these activities, with specific consequences for land use. An economic definition is that agro-pastoralists derive more than 50% of household gross revenue from livestock and 10-50% from farming (OXFAM 2008).

West Pokot County is among the Counties that practices agro-pastoralism. The agricultural knowledge among the farmers in West Pokot has been low as reported by Akuto, (2020). The lack of access to reliable and current information coupled with wide communication barriers between researchers and farmers are presently a significant impediment to the adoption of smart farming by agro-pastoralist in West Pokot County (Kemboi & Maina, 2017).

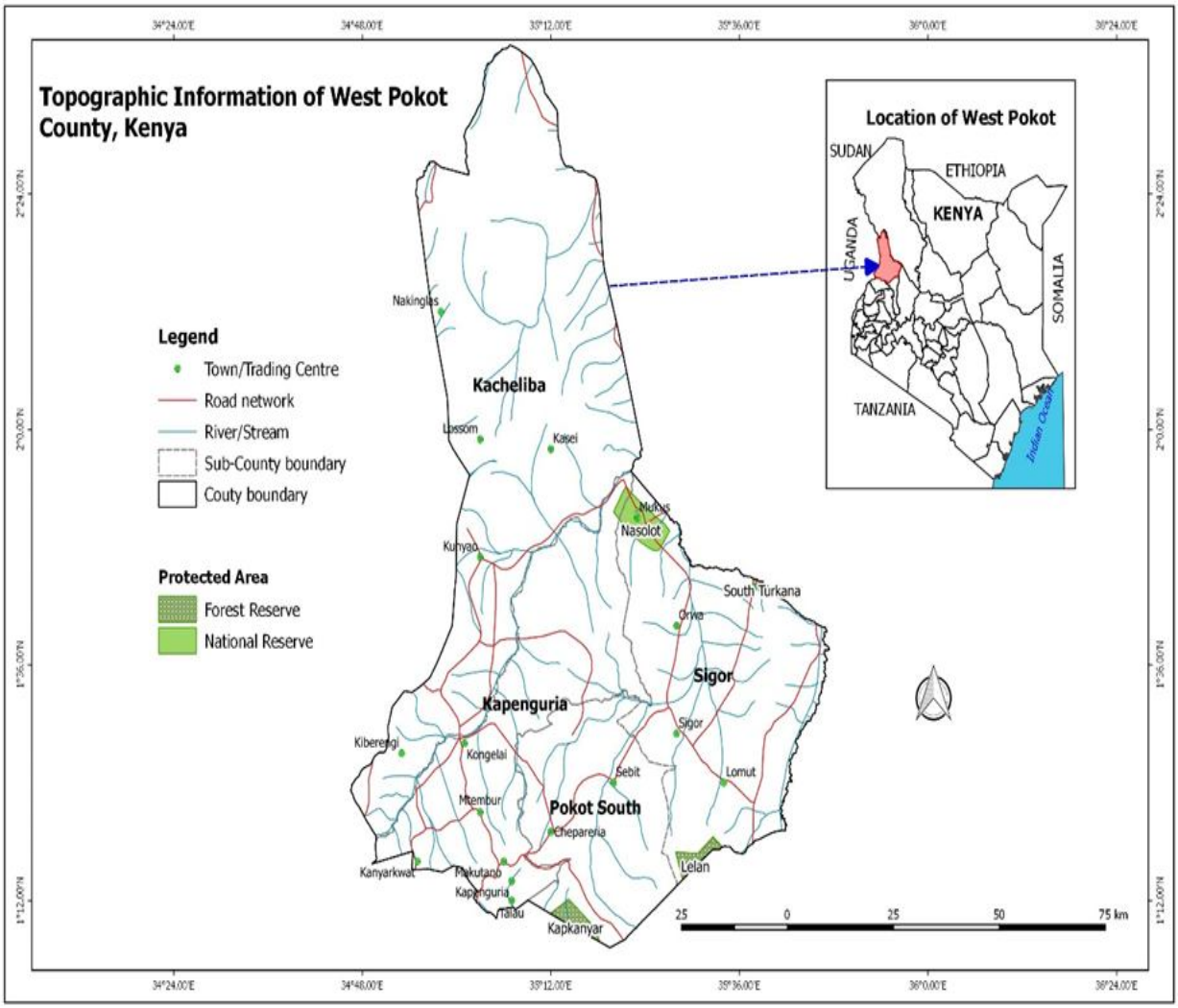
Some of the methods used by researchers and extension officers to communicate to agro-pastoralist include; include broadcast (television and especially radio), group (video, tape-slides, sound film-strips, audio-cassettes, overhead projections, flip-charts, posters, pamphlets, and leaflets; as well,

traditional folk media such as puppets and live-theatre may be included), and Interpersonal channels (community leaders, contact farmers, extension workers) (Fraser, 2017). In using the above, methods to communicate to agro-pastoralist, a lot of barriers are experienced that hinders communication and therefore, low uptake of climate smart agriculture among agro-pastoralist. Therefore, conducting the current study is justified in analyzing how barriers of communication such as language used in communication affect the uptake of climate smart agricultural technologies among agro-pastoralist in Kenya, with particular focus on West Pokot County. The hypothesis tested was that the barriers of communication do not influence the uptake of climate smart agriculture in West Pokot County.

Materials and methodology

Research Approach

The study employed a mixed approach, specifically sequential QUAN→QUAL mixed method design where by both quantitative and qualitative approaches were utilized concurrently. To ensure that the convergent parallel mixed-method process is systematic and rigorous, the researcher designed and conducted a sequential QUAN→QUAL mixed method design whereby there was initial quantitative approach compared to a subsequent qualitative approach


Topographic Information of West Pokot County, Kenya
Location of West Pokot
SUDAN
ETHIOPIA
KENYA
UGANDA
SOMALIA
TANZANIA
Indian Ocean
Legend
Town/Trading Centre
Road network
River/Stream
Sub-County boundary
Couty boundary
Protected Area
Forest Reserve
National Reserve
Kacheliba
Pokot South
Kapenguria
Sigor
Nakinglas
Lassom
Kasei
Kuhyao
Nasolot
South Turkana
Orwa
Sigor
Kiberenge
Kongelai
Sebit
Lomut
Mtembur
Chepareria
Lelan
Kanyarkwat
Makutano
Kapenguria
Talau
Kapkanyar
25 0 25 50 75 km
34°24.00'E
34°48.00'E
35°12.00'E
35°36.00'E
36°0.00'E
36°24.00'E
2°24.00'N
2°0.00'N
1°36.00'N
1°12.00'N

The study was conducted in West Pokot County. According to the 2019 census, the County has a population of 621,241. West Pokot County, whose Headquarters is Kapenguria, is mainly inhabited by the Pokot community and minority community of Sengwer (West Pokot County website, 2018). The agriculture, animal (livestock) keeping are the backbone of the County's economy with more than 80% of the population engaging in farming and animal (livestock)keeping activities. The County lies within Longitudes 34° 47'and 35° 49' East and Latitude 1° and 2° North and covers an area of approximately 9,169.4 km2 (West Pokot County website, 2018). The County has four sub-counties, namely West, Central, North and South (West Pokot County website, 2018).

The main food crops produced include maize, beans, sorghum, finger millet, green grams, Irish potatoes, sweet potatoes and bananas (West Pokot County website, 2018). The farmers also grow

horticultural crops, which include fruits (mangoes, pawpaw, oranges, tree tomato and passion fruit) and vegetables both exotic and local (onions, cabbages, kales, pumpkins, sucha, cowpeas, saga, peas and carrots, among others) (West Pokot County website, 2018). Fruits and vegetables contribute immensely to food security as farmers use it for food and generate income for households (Akuto, 2020).

Based on the 2019 census, the urban population accounts for only 8% of the total population in the County, making West Pokot one of the least urbanized counties in Kenya (KNBS, 2019). Being one of the least urbanized counties implies a lack of proper infrastructure to fuel communication and implement smart-climate projects in the County. West Pokot is also a beneficiary under the Kenya Climate Smart Project funded by the World Bank and implemented by Ministry of Agriculture, Livestock and Fisheries and the 27 County Governments. This formed the rationale to conduct the study in the County since it will be convenient in generalizing other counties that not urbanized.

Survey and sampling

The study was conducted in West Pokot County in Kenya, the county was selected to represent the 27 county governments where Kenya climate Smart projects has been supported by World Bank. To understand how barriers of communication adopted by agricultural researchers affects uptake of climate smart technology among pastoralist in West Pokot, a mixed approach was used with closed ended questionnaires supported with open ended questions to obtain both quantitative and qualitative data

The sample size for quantitative data was calculated using a formula adapted from Fishers (1992). The formula is presented in equation (1).

$$n = \frac{Z^2(pq)}{d^2}$$

n = the desired sample size if the targeted population is greater than 10000

Z= the standard normal derived at the required confidence level (The value for Z is found in statistical tables which contain the area under the normal curve).

d = the desired level of precision (an acceptable level of sampling error),

p = the estimated proportion of an attribute that is present in the population,

q = 1-p.

Using this Fisher (1992) formulae, the researcher used 30% as the estimated proportion of the farmers in West Pokot to have the characteristics of interest and calculate the sample size (n) for the study using the desired confidence level of precision (d) of 5% (0.05) and the Z- statistics of 1.96 (at generally acceptable level of 95% confidence level) Therefore, the sample size was calculated as shown in equation (2);

$$n = \frac{1.96^2 x 0.3 x 0.7}{0.05^2}$$

$$= 494$$

Using Fisher (1992) formulae, a total of 494 farmers were sampled in West Pokot County from the four sub-counties, (West Pokot 148, Central Pokot 105, North Pokot 148 and South Pokot 93). Purposive sampling was used to select 29 respondents for the key informant interviews. The respondents were selected based on their knowledge on the barriers of communication on the uptake of climate smart agriculture among agro pastoralist of West Pokot.

Data collection

Open ended and closed ended questionnaires were used to collect data. 494 farmers filled questionnaires and returned them for further analysis while 29 key informants were interviewed. The discussions involved how agricultural researchers has effectively used communication principles such as; clarity, attention, feedback, consistency, ways of communication, among others to impact uptake of climate smart technology among agro pastoralist in West Pokot.

Data analysis

Tables were used to show the percentage, mean and standard deviation to show how barriers of communication such language barrier and infrastructure has affected the adoption of climate smart agriculture among agro pastoralist in West Pokot. While Pearson's correlation analysis (Hugn et al., 2018) was used to check for the relationship between the barrier of communication used by agricultural researchers (language barrier, infrastructure, illiteracy among others) and the uptake of climate smart agriculture among pastoralist. Statistical significance considered at α=0.05. Dependent variable was the uptake of climate smart agricultural technologies and predictors (Constant) was barriers of communication. The association and differences farming practices and Sub Counties in West Pokot were evaluated using Chi Square test of association. Reliability of the data was assured through internal consistency which was measured using the Cronbach's coefficient while for the validity of the data, 5 experts in the field of communication and agriculture evaluated the questionnaire and the interview guides that were used to collect data.

The inferential statistics that were conducted included correlation and linear regression models. The two inferential statistics determined the relationship between each of the independent variables with the dependent variable. A regression analysis of Variance (ANOVA) was conducted

to establish whether the whole regression models are significantly fit of the data. The regression equation that was used to test the statistical significance of the relationship between independent and dependent variables of the study hypotheses is:

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

Where:

Y = Uptake of climate smart agricultural technologies

X_1 = Communication barriers

$\beta_0, \beta_1,$ = Regression coefficients of changes included in Y by each X value

ε = Error term, which normally is distributed with a mean and variance of zero.

RESULTS

Socio-demographic characteristics

Table I: Gender of the respondents

	Frequency	Percentage
Female	232	47.0
Male	262	53.0
Total	494	100.0

Table II: Level of education

	Gender					
	Female		Male		Total	
	Count	Column N %	Count	Column N %	Count	Column N %
Certificate	44	19.0	23	8.8	67	13.6
Diploma	12	5.2	34	13.0	46	9.3
Masters	1	0.4	1	0.4	2	0.4
None	65	28.0	64	24.4	129	26.1
Primary	58	25.0	65	24.8	123	24.9
Secondary	45	19.4	67	25.6	112	22.7

Undergraduate	7	3.0	8	3.1	15	3.0
Total	232	100.0	262	100.0	494	100.0

Table III: Main agricultural practice

	Gender					
	Female		Male		Total	
	Count	Column N %	Count	Column N %	Count	Column N %
Mixed farming	180	77.6	208	79.4	388	78.5
Crops farming	32	13.8	24	9.2	56	11.3
Livestock farming	20	8.6	30	11.5	50	10.1
Total	232	100.0	262	100.0	494	100.0

Table IV: Barriers of communication on uptake of climate smart agriculture

Statement	1 SA	2 A	3 N	4 D	5 SD	M
There is limited number of agricultural extension officers to disseminate information about climate smart agriculture	237	145	24	36	52	2.0
	48.0%	29.4%	4.9%	7.3%	10.5%	
The language used to disseminate climate smart agricultural information affects how farmers use the information they receive	136	189	82	44	43	2.3
	27.5%	38.3%	16.6%	8.9%	8.7%	
The sources of information are inadequate hence hindering the effective dissemination of agricultural research information on climate smart agriculture	160	176	71	51	36	2.2
	32.4%	35.6%	14.4%	10.3%	7.3%	

There are no information centers in West Pokot County where farmers can easily access and timely information about climate smart agricultural agriculture	107	153	80	99	55	2.7
	21.7%	31.0%	16.2%	20.0%	11.1%	
There is limited agricultural information infrastructure, such as; communication networks, electricity, etc., which run electronic media such as radio, TV, and mobile phones that can accelerate and promote the transfer of information on CSA to the farmers	183	171	51	36	53	2.2
	37.0%	34.6%	10.3%	7.3%	10.7%	
There is political interference in dissemination of climate smart agriculture	99	104	94	92	105	3.0
	20.0%	21.1%	19.0%	18.6%	21.3%	

The majority of the respondents (53%) were male while (47%) were female (Table I) this implies that there were more male involved in the study than female. Most male were readily available for the study as compared to female. The majority of the respondents in West Pokot had attended primary school (22%), while (26%) had not gone to school. Those who have gone to Secondary school were (19%) (Table II). This indicates that the majority of the respondents who participated in this research were not educated and only a few have gone through secondary and post-secondary studies.

This implies that most of the respondents were affected by barriers of communication used by researchers and extension officers. The barriers were like use of English to communicate in both broadcast and print media as most of the agro-pastoralist did not go to school and therefore, do not understand English. This limited their uptake of climate-smart agricultural practices communicated by agricultural researchers. The majority (79%) of the farmers reported practicing mixed farming. A chi-square test of dependence

found that there is a significant relationship between the Sub counties and main agricultural activity ($X^2 = 29.246^a$, $p<0.001$.) (Table III). The chi-square test confirmed that West Pokot people are agro-pastoralist as they both grow crops and also keep livestock in both sub-counties of West Pokot counties.

The results indicated that there is limited number of agricultural extension officers to disseminate information about climate smart agriculture (48.0%) of the agro pastoralist strongly agree with this (Table IV). This shows that the number of agricultural extension officers is not adequate within West Pokot County to disseminate information to farmers. This implies that some farmers are not able to get information on time on climate smart technology such as new crops or livestock breeds that can do well in their areas. The study findings were similar to a study by Mubofu and Elia (2017)

who also found out that farmers in Tanzania were not able to get agricultural services due to limited number of extension officers.

The results indicated that language used to disseminate climate smart agricultural information affects how agro pastoralist use the information they receive about climate smart agriculture (38.3%) of the agro pastoralist agree with this (Table IV). This implies that farmers fail to implement some of the information communicated by agricultural officers and researchers such as new breeds, information on fertilizers and types of crops due language barrier. Some of the extension officers, researcher officers and print media use English that farmers do not understand.

From the key informant interview, Ward Agriculture officers and Ward agriculture extension officers who interact mostly with the farmers, said that some of the scientific terms used by the scientist are not easy to translate therefore it is not easy to translate. They also said that most of the farmers do not understand English or Kiswahili so the best language is their mother language that at times when translated some meanings are lost. One of them said, “Most of our farmers do not understand English or Kiswahili, therefore the best language to communicate to them is local language, for me I don’t speak their local language so I need someone to translate and you know when we translate, some meaning might be lost. I think most of the farmers have not implemented the climate smart agriculture because of language.” The findings were similar to a study that was done by Mokotjo and Kalusopa (2010) who also found that language barrier and misinterpretation of information may also affect how famers use the information they have received.

The results indicated that the sources of information are inadequate hence hindering the effective dissemination of agricultural research information on climate smart agriculture (35.6%) of the agro pastoralist agree with this (Table IV). This implies that most of the agro pastoralist do not access information on climate smart agriculture therefore, this slows their uptake on climate smart

activities such as; use of quality seeds and planting materials of well-adapted crops and varieties, biodiversity management, integrated Pest Management, improved water uses and management, sustainable soil and land management for increased crop productivity, sustainable mechanization among others. The study findings were in line with Mubofu and Elia (2017) study who also found that inadequate sources of information was a barrier in Tanzania among farmers in accessing information on agricultural information.

The results indicated that there are no information centers in West Pokot County where farmers can easily access and timely information about climate smart agricultural agriculture (31.0%) of the agro pastoralist agree with this (Table IV). This implies that agro pastoralist are not able to access information centers to get information concerning climate smart climate technology as there are limited number of information centers. This has slowed the uptake of climate smart agriculture as farmers are not able to access information centers. The same was observed by Mubofu and Elia (2017) in Tanzania, who also found that the absence of information centers is a barrier to communication to farmers.

The results indicated that there is limited agricultural information infrastructure, such as; communication networks, electricity, etc., which run electronic media such as radio, TV, and mobile phones that can accelerate and promote the transfer of information on CSA to the farmers (37.0%) of the agro pastoralist strongly agree with this (Table IV). In West Pokot County, most of the farmers are agro pastoralist, most of the farmers do not have access to information infrastructure like television, this has limited their access to agricultural information on climate smart agriculture.

The results indicated that there is political interference in dissemination of climate smart agriculture (21.3%) of the agro pastoralist strongly disagree with this (Table IV). The agro

Pastoralist in West Pokot County indicated that politics doesn't interfere with dissemination of information on climate smart agriculture. Language used to disseminate climate smart agricultural information affects how agro pastoralist use the information they receive about climate smart agriculture (38.3%) of the agro pastoralist agree with this (Table IV). The sources of information are inadequate hence hindering the effective dissemination of agricultural research information on climate smart agriculture. The study findings disagree with the findings of Mubofu and Elia (2017) in Tanzania, who found out that politics interfere with the dissemination of agricultural research information to farmers. In West Pokot, politics does not play a role in communicating climate smart agriculture and most of the respondents did not see it as a major problem. It's true in Kenya that politics might interfere with other economic sectors but in West Pokot it did not interfere with communication of climate smart agriculture to the farmers therefore it was not a major barrier mentioned by farmers

From the key informants, poor communication was also mentioned by those who were interviewed as a communication barrier in disseminating information to farmers. According to Associate Professor from University of Nairobi,

> "Most of us researchers use poor communication techniques to communicate our findings to Main target audience. Most of us do not share our reports to the extension officers, farmers; instead, we only publish and assume that farmers will read our published articles. I think we should organize face to face visits which entail field demonstrations, farmer trainings, Barazas etc. and even share our findings with the farmers in their farms."

Pearson's correlation analysis on the relationship between the barriers of communication and uptake of climate-smart technology among agro pastoralist

Analysis of how the uptake of climate-smart agriculture by farmers in West Pokot County is affected by barriers of Communication was run through testing the research hypothesis. The model

summary table generated models reflective of the predictors. The coefficient of determination (R^2) of the model provided the lowest fit (R^2= 0.050) (Table V) meaning that the model explained 5.0% of the variations in barriers of communications on uptake of climate-smart agriculture among agro pastoralist and was considered to provide a good fit as illustrated above in model summary table

below. R^2; 0.058 = 5.8% (Table V). An analysis of the ANOVA shows that the F value was 2615.7, p value 0.001 ($p<0.001$) (Table VI), and therefore, significant. This implies that there is a linear relationship between uptake of climate-smart agriculture (UCA) and the independent variable (Barriers of communication-BoC. Changing barriers of communication with one unit would enhance uptake of climate-smart technologies by up to 21.9%. Barriers of communication (BoC) significantly influence the uptake of climate-smart agriculture (UCA) ($p<0.001$) (Table VII). The significance level for the t-statistic was less than 0.001 ($P<0.001$) as indicated hence the study upholds the alternative hypothesis which states that barriers of communication have a significant effect on the uptake of climate smart technologies in West Pokot County. Despite being significant, the barriers predicted the uptake of climate smart technologies among farmers negatively. From the results, eliminating barriers in West Pokot County among Agro pastoralist will increase farmers' increases of uptake to climate smart agriculture such as; soil management, drought tolerant maize, dairy development, rainfall forecasts among other in West Pokot, Kenya.

Table V Model Summary of the correlation analysis

Model	R	R Square	Adjusted RSquare	Std. Error of the Estimate
1	.225[a]	.050	.049	.915

a. redictors: (Constant), Barriers of communication

Table VI An overall assessment of the significance of the regression model using ANOVA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.877	1	21.877	26.157	.000[b]
	Residual	411.494	492	.836		
	Total	433.370	493			

a. Dependent Variable: Uptake of climate smart agricultural technologies

b. Predictors: (Constant), Barriers of communication

Table VII An overall assessment of the significance of the regression model using

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.132	.133		31.019	.000
	Barriers of communication	-.268	.052	-.225	-5.114	.000

a. Dependent Variable: Uptake of climate smart agricultural technologies

Conclusion

The study found out that communication barriers that affect uptake of climate smart agriculture among agro pastoralist include; language barrier, poor communication techniques, inadequate information centers, limited numbers of extension officers in the field and inadequate information infrastructures to facilitate communication. This has hindered agro pastoralist adoption of climate smart agriculture such as; use of quality seeds and planting materials of well-adapted crops and varieties, biodiversity management, integrated Pest Management, improved water uses and management, sustainable soil and land management for increased crop productivity, sustainable mechanization among others. Therefore, the study concludes that there is need for scientist and agricultural officers and agents to find ways to eliminate the barriers mentioned to ensure that farmers are bale to receive information on climate smart agriculture on time. This will ensure more adoption of climate smart agriculture among farmers in West Pokot,Kenya.

Recommendations

The study recommends that agricultural officers/agents should be those who understands and communicate to farmers using the local language that farmers understand. Print media written in English about climate smart technology can be translated to famers' languages. Information about climate smart agriculture can also be passed through local radio stations that speak local language that farmers understand better. This calls for the scientists/researchers to apply Science communication for effective uptake of climate smart agriculture technologies.

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