

Farmers' Perceptions of Climate Change. A Case of Nakasongola District in Uganda

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ABSTRACT.

Background: Ugandan farmers are susceptible to the changing climate with unpredictable rainfall distribution and severe rising temperatures. Climatic change is likely to affect the basic elements of life for people around the world resulting into no access to water and food production, hence hundred millions of people could suffer hunger and water shortages leading to severe death. This paper is aimed at exploring farmers' perceptions of climate change.

Material and method: The study employed a case study design where several instrumental bound cases are examined. We utilized multiple data collection methods to explore perceptions of climate change. We also chose the qualitative-focused enquiry for this study because this approach allows the comparison of different stakeholders' perspectives drawn primarily from a qualitative approach. Data were collected using semi-structured interviews from fifteen purposefully selected local farmers from selected sub counties.

Results: Findings revealed that farmers perceive climate change news as a source of negative excitements such as fear, worry and intimidation. Similarly, findings revealed that bush burning, deforestation, bush burning and over grazing are the major causes of climate change. In addition to ignorance amongst the people who are not clearly aware of what climate change is and they don't know why they receive little rain fall, why very hot days.

Conclusion: This research study revealed a number of key ideas and it is concluded that some people are not informed clearly of what is causing climate change and the inadequate information about climate change needed to be improved to help the entire generation understand climate change. And it was thus concluded that people's awareness on climate change is vital for a sustainable livelihood.

Keywords: Perception, Climate change, qualitative-focused enquiry, Nakasongola, Uganda.

INTRODUCTION

Perceptions about climate change are complex, unpredictable and it is worth distinguishing among different types of perceptions. For instance, the belief that it is happening and the belief that it is caused by humans (Mata et al., 2025). These two beliefs are often distinguished in survey research. Then there are perceptions about the consequences of climate change, including beliefs about its impacts on human health and wellbeing and an overall assessment of the consequences as good or bad (Steg, 2023).

Perception about climate change is understanding public knowledge on climate change and it is a crucial component in the climate communication process (Odoom, 2024) as well as understanding the views, attitudes, and beliefs of the public on climate change is considered an instrumental dimension in the climate change and mitigation processes (Shi et al., 2015). Perceptions about climate change in Uganda is entirely a big question that must be understood today as media regularly disseminate knowledge regarding climate change and its ramifications for agriculture and global food systems thus enhancing awareness and comprehension of climate change, as well as global policy strategies aimed at addressing the difficulties it has caused by climate change in Uganda (Bahati, 2024; Nsubuga & Rautenbach, 2018).

However, scientists are looking into the origins of the phenomenon, seeking answers that will somehow help to mitigate the effects of climate change (Nunes & Ferreira Dias, 2022). Climate change is defined as the shift in climate patterns mainly caused by greenhouse gas emissions from natural systems and human activities. So far, anthropogenic activities have caused about 1.0 °C of global warming above the pre-industrial level and this is likely to reach 1.5 °C between 2030 and 2052 if the current emission rates persist (Cadez & Czerny, 2016). The 20th century was the warmest the world has seen in 1,000 years, and the 1980s and 1990s were the warmest decades on record (Magado & Ssekyewa, 2018).

In addition, Rummukainen (2012) and Trenberth (2011) assert that climate change is more than a warming trend thus, increasing temperatures is as a result in changes in many aspects of weather, such as wind patterns, the amount and type of precipitation and the types and frequency of severe weather events that may be expected to occur in an area. For instance rainfall changes are in addition to environmental health problems such as respiratory diseases and potential global food shortages in the Southeast Asian countries such as Thailand with a high frequency of climate-related hazards, such as droughts, floods and landslides, which have resulted in substantial impacts in many areas (Ismail & Go, 2021; Lasco et al., 2011; Manandhar et al., 2015; Mirza, 2011). Climate change and the threat of related extreme conditions such as droughts which is a concern to Nakasongola district are under mitigation strategies (Cadez & Czerny, 2016; Fawzy et al., 2020).

Climate change is happening due to natural factors and human activities and it expressively alters biodiversity, agricultural production, and food security (Thornton & Lipper, 2014). Though there is no agreed definition for the term “climate change” it is the inherent characteristic of climate that manifests itself as changes of climate over time and it could be labelled through the alterations among long-term statistics of meteorological rudiments intended for dissimilar period (Muluneh, 2021).

MATERIAL AND METHODS

Research paradigm and study population: This study utilized an interpretivist research paradigm in which the research questions are grounded in an epistemological position with assumptions that data tells us something about farmers’ perception of climate change following a case study research design. The study population, consisted of fifteen participants from Kalungi, Kakooge Lwampanga, Nakasongola town council, Nabisweera, Wabinyonyi and Nakitooma all of which were local farmers and local leaders.

The population of the local farmers and local leaders was drawn from the primary information provided in Table 1.1:

<i>Distribution of local farmers/leaders</i>	<i>Proposed interview sample</i>	<i>Actual interviewed Sample size</i>	<i>Sampling strategy</i>
Kalungi	06	03	Purposive
Kakooge	2	01	Purposive
Lwampanga	05	03	Snow ball
Nakasongola town council	07	03	Purposive
Nabisweera	10	02	Purposive
Wabinyonyi	06	02	Purposive
Nakitooma	03	01	Purposive
TOTAL	51	15	

Source: Primary data source

Study Design: This study has followed a case study research design to explore the perceptions on climate change and mitigation strategies among people in the district. According to Mouton (2001) a research design refers to a plan of how you intend to conduct the research addressing specific questions. This plan informs a specific research methodology. This study adopted a multiple interpretivist case study design/approach with two units of analysis at the selected sub counties in the district.

Study sample: The study employed 15 participants. The criteria for selecting the participants were based on; age, academic qualification, experience and residency in the case of Nakasongola district (Schreier, 2018). These are the factors that guided us to determine the sample size in a qualitative study. In addition, participants were accessed on appointment which enabled them to conveniently be interviewed. The snow ball sampling techniques was also used to complement purposeful sampling as an attempt to get rich information about farmers' perceptions of climate change. I purposively chose from local farmers and local leaders, those with authority, those with experience and they are desirable in this specialized situation of climate change in Nakasongola district. I chose ten renown local farmers and five local leaders. As a qualitative researcher, I may get responses from fewer participants and reach the saturation level of my data collection

Research methods: Data were collected using semi-structured interviews from fifteen purposefully selected local farmers hence we used both primary and secondary data collection methods. The secondary data collection method consisted of analyzing various types of documents including national environment management authority. We chose this method as it is an important research tool and allows for triangulation of information. We also utilized interpretive methods for data collection, due to the fact that qualitative research methods are of greater value especially on enabling the understanding of phenomena.

This study being qualitative and interpretive in nature, the focus was on how the participants make meaning of a specific phenomenon such as curriculum leadership styles by analyzing their understanding and experiences upon this theme. Therefore, to have a clear analysis of the data, all recorded interviews were listened to several times immediately after every interview.

RESULTS

This section reports findings about farmers' perception of climate change in Uganda. The number of participants in this study, were as follows in Table 1.2 that provides a summary of participants' profiles.

Table 1.2: Provides a summary of participants' profiles

subcounty	Parish/village	Participant's Code	Highest Academic Qualification	Agricultural activity	Working Experience
Kalungi	katugo	KLCNS	PLE	Seasonal crop growing	10 years
Kakooge	Kyabutaayi	KO-LCEAT-1	UCE	-Animal keeping -Seasonal crop growing	20 years
		KO-LCEAT-2	UACE	Animal keeping	30 years

		KO-LCEAT-3	Primary five	Seasonal crop growing	40 years
		KO-LCEAT-4	Primary six	-Seasonal crop growing -Animal keeping	25 years
		KO-LCEAT-5	PLE	Seasonal crop growing	22 years
Lwampanga		LWA-CAES1	PLE	Animal keeping	17 years
		LWA-CAES-2	PLE	-Seasonal crop growing -Animal keeping	16 years
		LWA-CAES-3	PLE	Seasonal crop growing	14 years
Nakasongola town council	Nakasongola	NAKA-LCCIS-1	UCE	Animal keeping	11 years
		NAKA-LCCIS-2.	UCE	Seasonal crop growing	13 years
Nabisweera	Migyeera	NAB-CHS- 1	UCE	Animal keeping	13 years
		NAB-CHS- 2	PLE	-Seasonal crop growing -Animal keeping	50 years
Wabinyonyi	Roma	WA-COVAB,	UACE	Seasonal crop growing	13 years
Nakitooma		NAK-COCIS	PLE	Seasonal crop growing	14 years

Source: Primary data source

Sub-Theme #1: Farmers' perceptions and awareness of severe temperatures

In my interface with the participants, I realized various views upon climate change in various sub counties in Nakasongola district. Indeed, majority of the participants expressed their views on climate change as variant and gave the researcher a task to understand their opinions on climate change and mitigation strategies upon the

impact of climate change. In this sub-theme, awareness on climate change was emphasized. Data collected was tailored according to the research questions/objectives on the climate change and mitigation strategies. Several interviews were held and information was got as far as the participants responses were concerned.

The first participant was KLCNS a resident of Katugo, Kalungi subcounty Nakasongola district. This participant has stayed at katugo village for over ten (10) years. She grows crops and rears animals. She calls herself a peasant farmer. The participant was the coordinator of village farming groups for some good years. It is in this spirit that the participant revealed that she mainly grows seasonal crops due to the unreliable rainfall that spells throughout the year. She stated that: crops with the long gestation period cannot be sustainable with any yields.

Similarly, another participant revealed that in his village, people are not aware of climate change and its causes. We leave everything to God to decide and we can't tell what it means by climate change. The participant confirmed that little or no rainfall is received throughout the year in her village.

In addition, participant KLCNS2 a resident of Katugo too, reveals that, information regarding climate change is not well spread and every village man has his own way of thinking about climate change, instead the awareness of climate change varies from person to person, from village to village and from subcounty to sub county. Some people are careful about climate change while others are not concerned at all. In addition, not all people in my village opt for environment conservation, but instead live a careless life upon habitat conservation.

More highlights upon the awareness of climate change are only accorded to parish and sub county chiefs. For instance, KO-LCEAT-1 who is a senior citizen in Kakooge Kyabutaayi village stressed that:

"Climate change is not our concern, we only want to know the present, but we are not concerned with future. We have only transformed our lives through peasantry agriculture and that is all what we know".as said participant KO-LCEAT-6. Similarly, KO-LCEAT-1 emphasized that they are aware of the hot days, very little rainfall and sometimes drizzling just. In this regard were not informed clearly what is causing this, but sometimes our leaders emphasize planting of trees that may help to supplement on our rains but we can't see rain and any good change, instead our climate is worsening. Therefore, I embrace the dry days as being the order of the day and I think this is what I know about climate change.

KO-LCEAT-2 added that, 20% of my fellow peasants have no care and positive attitude towards climate change implying they have no intention to look for mitigation strategies to curb the impact of climate. Study participants revealed that some people in their villages are not informed about climate change, they are not happy over the kind of climate that thrive, but they are not informed over the prevailing climatic conditions in their area.

Peoples' involvement on climate change is very important and key hence this is backed with sharing information that can help to understand climate changes in our localities. In regard to the issue of awareness of climate changes, most people in their localities need to be aware of what may result into vagaries of weather and try to look for mitigation strategies so as build citizenry responsibility on climate, well prepared, self-reliant and creative generation that can conserve its flora and fauna. Hence KO-LCEAT-2 noted that: planting of trees in our environment is very key in helping to conserve our natural habitat by building interest and caring for our environment. In in similar way, as citizens we need to have the local environment management perspectives. One of the participants KO-LCEAT-3 further revealed that: We need a community weather station to help us record the amount of rainfall and sun shine using a rain gauge and at the end of the month, we are able to report the amount of rainfall we receive. Thus, this awareness or the good understanding on our climate can help us conserve it.

Similarly, KO-LCEAT-4 confessed that: the awareness on climate change could look at climate change and variability as an emerging issue that could often be mentioned in all our villages. We can participate fully in how to design projects and workshops to better understand our environment, the magnitude of damage and consequences of climate change must be known to my family, instead we don't have enough information about climate change. All in all, it is evident that majority of the participants from all the sub counties confirmed that they are not clearly aware of what climate change is and they don't know why they receive little rain fall, why very hot day. Some participants say that it is God who knows.

Similarly, the researcher asked the local farmers to elaborate how they understand their climate and some other participants KO-LCEAT-5 and LWA-CAES1 equally revealed that:

“As an individual, I confirm no knowledge and awareness on climate change. It is good for my fellow farmers to always be aware and predict the seasons, but we are not all that properly informed of the driving factors of the threat. One of the farmers was wondering why there are no mangoes in Nakasongola in the month of march and April yet mangoes used to be much in those very months. This implies farmers had started noticing climate changes and it was necessary to provide information related to the effects of climate change so as to create awareness to the population.

Sub-Theme #2: Farmers’ views on climate awareness

Findings showed that some people are aware of the dangers of heavy rains that may sometimes lead to landslides, damage crops, destruction of property and causing floods hence kill animals and plants (LWA-CAES-2 and LWA-CAES-3). In the equivalent vein, local farmers (LWA-CAES-3 and NAKA-LCCIS-2) also communicated that they receive message about climate change on burials, weddings, meetings, and bars. Participants (KO-LCEAT-5, KO-LCEAT-4, LWA-CAES-2 and LWA-CAES1) asserted that:

They also specified that the onset of rains is now deferred while ending is earlier against the trend in the past years. This substantiates the meteorological parameters obtained from Uganda Meteorological stations. The Study further indicates that, though there are natural causes, most of rural people accepted human activities as major causes of climate change/variability. The results also presented that the effects of climate in rural areas of Nakasongola include poor crop yields, reduced soil fertility, poverty and food shortage.

For instance, the elders of my society wherever they greet, begin by asking matters of climate changes and weathers of various places. Indeed, some other participants in most of the villages confessed that: In the entire Nakasongola district, elders have always expressed their concerns on various issues of climate change like; the shifting rain seasons, the longer than the usual dry spells, un reliable rain fall, short rains, hence spreading a local gospel that Nakasongola is undergoing bad times than usual than understanding that it is climate change.

In addition, participant NAKA-LCCIS-2 revealed that: Majority of the farmers are aware that climate extremes for example prolonged droughts were becoming more frequent in their area. However, most of the farmers reported that these changes were as a result of poor farming practices such as overgrazing, uncontrolled bush burning and destruction of woodlands for charcoal burning among others that are occurring in Nakasongola district. Severe prolonged droughts consequently result into increased crop failure and shortage of water and pastures for livestock. Lack of water and pastures for livestock leads into reduced milk production and loss of livestock especially cattle as a result of extreme starvation were evident in almost all the sub-counties in Nakasongola district.

Even when talking to the entire population of Nakasongola, not all people in my village opt for environment conservation and none speaks clearly on the portfolio that their environment is undergoing climate change and could not tell the causes of climate change, yet the activities like bush burning, deforestation and swamp reclamations that lead to climate change are still on-going (NAB-CHS- 1 and NAB-CHS- 2).

The findings from an interview with WA-COVAB implied that a person with interest and knowledge about climate change issues, provided several facets of climate changes as follows:

I continuously observe the changes in the patterns of rainfall and temperatures in my subcounty are varying seasonally. Am an eye witness and interested party because I practice farming. I have empathy for my environment and I could strive to protect it. Therefore, am aware of the causes of climate change as follows (KO-LCEAT-2):

Table 1.3: Participant's awareness on the causes of climate change

Causes of climate change	Percentage (%)
Bush burning	35
Poor methods of farming	30
Deforestation	20
Overgrazing	10
Swamp reclamation	05

Data set based on Primary source: KO-LCEAT-2

The participants view on climate change reveals that bush burning contributes 35%, poor farming methods contributes 30%, deforestation contributes to 20%, overgrazing 10% and swamp reclamation 5%. This implies that many people are not aware of the climate change in Nakasongola and majority have insufficient knowledge about climate change. Secondly, people are not aware of other causes of climate change than human alone.

Sub-Theme #2: Sources of information on climate change

Through Semi-Structured Interviews, two participants (i.e. KO-LCEAT-3 and KO-LCEAT-4) were asked the sources of information they have on climate change and results were presented in **Table 4.4: Sources of information**

s/n	Source	Percentage (%)
1.	Televisions	1
2.	Radio	53
3.	Internet	5
4.	Elders /Parents	10
5.	Drama	1
6.	Life experience	20
7.	Messages from telephones	4
8.	Community meetings	20
9.	News papers	1

From Table 4.4 above, local farmers from the selected sub counties of Nakasongola revealed that they aware of climate change through various ways. For instance, radios provide (53%) as a main source of information on climate change. Local leaders and central government through radio programs have greatly disseminated information about climate change. In addition, community meetings and life experience have provided (20%), Elders/parents (10%), Messages from telephones (4%), Internet (5%), Newspapers, Drama and televisions (1%).

Interviews with local farmers about sources of information on climate change revealed that accessible information on various medium was the most appropriate source of information. Some local farmers have small

radios and can always listen to some radio programs on climate change and those without could get information from community gatherings.

Farmers' perceptions and attitudes of seasonal rainfall variations

Table 4.5: Participants' views on perceptions and attitudes of seasonal rainfall variations

Participants' views on perception and attitude of temperature variation	Participants who held this view
Under conditions of increased temperature and reduced rainfall Subsistence food production is deteriorating due higher temperatures Hostile weather conditions (too much sunshine)	KLCNS; KO-LCEAT-1 KO-LCEAT-2 KO-LCEAT-3 LWA-CAES-1, LWA-CAES-2 and NAB-CHS-1, WA-COVAB-1
Participants' views on perception and attitude on rainfall variation	Participants who held this view
Have observed a change in the timing of rainfall, we sometimes receive rainfall in the months Months of march, April and august being so dry. We receive un reliable rainfall in the months November and January Rainfall unpredictability is related to increased water shortages and a reduction in biodiversity	WA-COVAB-1; NAK-COCIS
Participants' views on perception and attitude on changing seasons.	Participants who held this view
Dry seasons are longer There is low rainfall in our area We see temperatures are warmer Strong winds in recent times Drying up of streams / rivers, Delayed onset of rains/stormy weather is common	LCEAT-4, LWA-CAES-3 NAB-CHS-2

Ethical Approval

The study was conducted in an ethical manner. Participants from the different sub counties were requested to provide data freely. Prior to data collection, researchers introduced themselves to relevant authorities at

Nakasongola subcounty headquarters before accessing participants. An introductory letter was obtained from the Dean, college of education Kampala International University introducing researchers to study participants. Researchers observed all ethical values regarding confidentiality, anonymity, benefits of the research, use of recording devices and data ownership and the participants' freedom to withdraw at any stage of the study.

CONCLUSIONS AND RECOMMENDATIONS

In conclusion, the main findings from the research study revealed a number of key ideas and it is concluded that some people are not informed clearly of what is causing climate change and the inadequate information about climate change needed to be improved to help the entire generation understand climate change. And it was thus concluded that people's awareness on climate change is vital for a sustainable livelihood. Basing on the findings above, several key recommendations emerged. For instance, it is recommended that local leaders should emphasize massive awareness on climate change. Massive awareness should be emphasized and people are made aware of the dangers of climate change especially the extreme weather conditions. This can be done by grouping people in their localities and provide more sensitization programs about climate change on quarterly basis.

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