TERMS OF CHANGE: HOW FARMERS IN UGANDA TALK ABOUT CLIMATE CHANGE

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1. Introduction

Since African farmers are among the groups most vulnerable to the impacts of climate change, it is crucial to understand whether they are aware of this phenomenon, what aspects of it they perceive it and how they discuss it in social settings. This information can assist in shaping adaptation policies and programs that better fit their concerns and needs as well as in developing communication strategies to disseminate climate information among rural populations.

This study contributes to such an understanding by examining an unusual body of data, namely transcriptions of conversations about climate of that occurred during farmer group meetings in Uganda. What is distinctive about this research is that the farmers' comments on climate change were unsolicited, unlike most studies on climate change perceptions which draw on information elicited through surveys and interviews.

While the group meetings did occur in the context of a project centered on the dissemination of seasonal rainfall forecasts, the topic of climate change was never mentioned in relation to the forecasts or introduced into the discussion by the researchers. Nonetheless, while discussing the seasonal climate forecasts, farmer occasionally (and spontaneously) turned to the topic of climate change.

The study was conducted under the auspices of the Center for Research on Environmental Decisions (CRED), a research consortium led by Columbia University, and funded by the National Science Foundation's Decision Making Under Uncertainty program (www.cred.columbia.edu). The CRED's goal is to elucidate how framing of risk communication and decision-making shapes the way people understand and respond to uncertain climate information. Shared knowledge, cultural meanings, and linguistic terminologies, such as those examined in this study are examples of such framing.

2. Research Site

Southern Uganda is located near the Equator and benefits from relatively favorable rainfall conditions. But the region includes semi-arid areas that suffer from more frequent drought and climate variability due to the "rain shadow" effect of hill ranges. In particular, there is a stretch of territory stretching from southwest to northeast, known as the "cattle corridor" because agropastoralist systems prevail as the main livelihood source. The research site is located at the southern edge of the corridor, in the Rakai District, near the border with Tanzania (Figure 1). The area's vulnerability to drought has made it a priority district for the national climate change adaptation policy (NAPA): consequently the Department of Meteorology strongly recommended selecting Rakai as a site.

The local climate is characterized by a bimodal rainfall pattern and by an average annual rainfall of 1,039 mm. Farmers in the area distinguish two separate rainy seasons, which correspond to two periods of crop production. The first season (*toggo*), which spans from March to May (annual average, 436 mm) and the second season (*ddumbi*), which runs from September to December (annual average, 386 mm) (Figure 2). The first season brings more rain but is highly variable, particularly in the

timing of the onset. The second season is longer and more evenly distributed, but receives less rain as a whole.

These averages are based on data from four rainfall stations in the area (Kibanda, Lyandonde, Kalisizo, and Kiteredde) for the period 1965-76 and 1999-2005. No data are available for the 25 years between 1976 and 1999 due to the political turmoil during the Amin and Obote regimes and the ensuing conflict and slow reconstruction after President Museveni's take over in 1986. The data gap seriously hinders the analysis of climate change trends, though there is limited evidence of a slight decline in annual rainfall and greater variability in rainy season onset (Majugu 2006).

Crop production is an important source of livelihood for rural households in Rakai. Women are heavily involved in agriculture, producing mostly for home consumption, while men tend to grow crops for the market. Bananas are grown on the moist valley floors and between ridges of hills. Annual crops (maize, beans, peanuts, potatoes, and sweet potatoes) are also planted during each rainy season. Cassava is also grown on most farms, providing food particularly at times when maize and other annual crops fail to yield. Households maintain coffee groves for cash income, or raise small livestock. Cattle-keeping prevails in the drier western and northern parts of the district.

3. Methodology

The Uganda research team consisted of two anthropologists from U.S universities, two linguists from the Makerere University (Uganda), and colleagues from the Ugandan Department of Meteorology. At the onset of each rainy season, the latter produces seasonal climate forecasts in collaboration with other national meteorological services in the region (Patt et al. 2008). The forecasts are then integrated into Ministry of Agriculture advisories to be disseminated to rural populations, but the information does not usually reach farmers in time or in a format and language that facilitate its understanding and use. This study sought to address this challenge by exploring the potential role of farmer groups in the dissemination and application of climate information. Being one of the epicenters of the AIDS epidemic in the 1980s, Rakai district has attracted a large number of NGOs and projects, many of which have fostered the formation of a dense network of community groups. Initially devoted to caring for orphans and reducing infection, such groups have eventually expanded to improving household incomes through improved agricultural technology (Roncoli et al. *in press*).

The seasonal climate forecasts were translated by the Ugandan linguistics experts into a simple narrative format, a paragraph consisting of a few sentences in Luganda, the local language. Forecasts for the Sept-Dec 2005 and the March-May 2006 rainy seasons were presented in the form of a tape-recorded message from the Department of Meteorology to pre-existing farmers groups during their regular meetings. The groups were then asked to discuss how they understood and how they might use the climate forecasts that were delivered to them, with no instructions being given as to how and what they should do or discuss. At the end of the discussion, group members were encouraged to ask questions of the research team and formulate recommendation on how the Department of Meteorology could better serve their information needs.

In total, 15 meetings with 9 groups were held: 6 in September 2005 and 9 in March 2006 (including the 6 old groups and 3 new groups). Group size ranged from 5 to 34, with a median size of 13 people, including 62.5% women and 37.5% men (N=208). The meetings were video- and audio-recorded, transcribed, translated into English by the team linguists. The transcripts comprised a total of 5,069 turns by group participants, where a "turn" is a continuous set of utterances (phrases, words, or minimal responses) by an individual, preceded and followed by contributions by others. The transcripts were coded by three undergraduate students at the University of California, Davis for a number of themes and attributes.

In order to understand how people conceptualize climate variability and change we focus focused on linguistic terms that refer to change. We searched the Luganda version of the transcripts for turns that contained words for "change", namely *kukyuka* (meaning "to change" in the broader, general sense); *kukyukakyuka*

(meaning “to change continually”), and *kukyusa* (the reflexive form, meaning “to change oneself, itself”). We also searched for turns in the English translation that use word “change”. We then dropped those cases that did not refer to weather and climate. This process yielded 40 turns, which were then coded for additional variables such as group name, meeting date, gender and status of speaker, turn topic, “change” term, reference to past, and reference to climate variability, change, or both, climate parameter or other aspects/impacts of climate, etc.

Examples of “Change” Turns

- The rains have always come in September, but they are now changing pattern.
- The weather has changed so much that sometimes it even rains in December.
- Well, it [the weather] seems to have changed, otherwise in the past, whenever the clouds appeared in that direction, we automatically knew it was going to rain.
- Trees have been attacked by uncommon diseases, there are many crop diseases currently. This problem might also be a result of weather changes.
- With such changing weather patterns, it is wise to grow it [millet] It is better to grow millet.

4. Research Findings

The transcript analysis suggests that “change” is a dimension that Ugandan farmers often associate with climate. Considering the 15 meetings as units, we found the climate change was discussed in more than half of them (8), either alone or in conjunction with references to variability (Figure 3). One-third (5) of the meetings included discussion of climate variability (both intra- and inter-seasonal), either alone or in conjunction with climate change. In another third (5) of the meetings there was no discussion of “change” (whether long- or short-term) in reference to climate.

The data shows that concern with “change” in climate is a widely available topic across different social groups, rather than being unique to one segment of the population (such as men or leaders who might have been more exposed to the media, NGO campaigns, or national and global discourses on environmental change). An analysis of speakers of “change” turns reveals that the distribution of such turn among men and women and among people of different social status did not differ significantly from the overall distribution of turns in the meeting transcripts (Figures 4 and 5).

The topic of climate variability and change as topics is usually brought up in the context of discussions about rainfall and agriculture, rather than as a larger shift in the conversation. This is demonstrated by the fact that, following its introduction in the group discussion, this focus on “changes” in climate is sustained by only a few turns rather than being elaborated over a long stretch of conversation. Less than one-third (12) of the “change” turns sampled are followed by other turns that discuss climate variability and change. When following up, other group participants were generally supportive of the view that the climate was changing: there were no cases in which other farmers challenged this view (though it must be noted that prevailing cultural values discourage the expression of direct criticism or dissent in public).

The majority of “change” turns (28) refer to climate change rather than seasonal or short-term variability, in contrast with the common assumption that African farmers are mostly concerned about immediate needs and largely focused on short terms weather events. In both the climate change and climate variability turns, change in rainfall patterns is by far the most frequently mentioned topic, with 80% (32). Most discussion of rainfall changes pertain to the timing of onset of the rainy season and the amount of precipitation, both parameters that have a significant effect on crop performance (Table 1).There are some references to change in relation to shifts in planting times, the growing incidence of plant and tree disease, and the reliability of climate forecasts. The latter refers to predictions based on both scientific and indigenous knowledge (Orlove et al. *in press*).

In many cases, speakers of “change” turns used a specific word or term indicating a point in the past that serves as a reference against which the new, different, or unusual conditions that prevail in the present setting are contrasted. In these discussions, farmers evoked a multiplicity of time frames, stretching from recent years (in experience of most) to several decades (in experience of older participants) to further past (in experience of prior generations, who could have related their personal experience to participants) to remote past (understandings of more distant history) (Table 2).

5. Discussion and Conclusion

To design effective messages and strategies to support adaptation and mitigation efforts it is important to know whether communities that are being affected by climate change are aware of it and, if so, how they perceive it. Several lines of evidence from this ethnographic study suggest that African farmers are generally familiar with climate change and this awareness is distributed across groups and social categories Rather than being a topic that is restricted to a category of experts, specialists or leaders, climate change is introduced easily in conversation as farmers as they discuss climate forecasts and farm management plans.

The analysis of meeting transcripts shows that changes in climate are perceived in terms of cultural understandings of weather variation and grounded in well-established patterns for describing the weather. For example, discussions of climate variation are rooted in linguistic terminologies that relate to change and multiple timeframes for invoking the past.

The data also shows that farmers are particularly concerned with agronomically significant aspects of climate variability and change (e.g. delayed onset of rains). Farmers concerns for climate change largely centered on precipitation, a crucial factor in this area, where rains are often insufficient for crops to germinate, mature and reach harvest. This is worth noting given that many models of climate change are more confident in their predictions for temps rather than rainfall, especially in Africa. It also means that communication that emphasizes parameters such as temperature changes associated with global warming may be less effective in capturing farmers’ attention and motivating them to respond positively.

6. Works Cited

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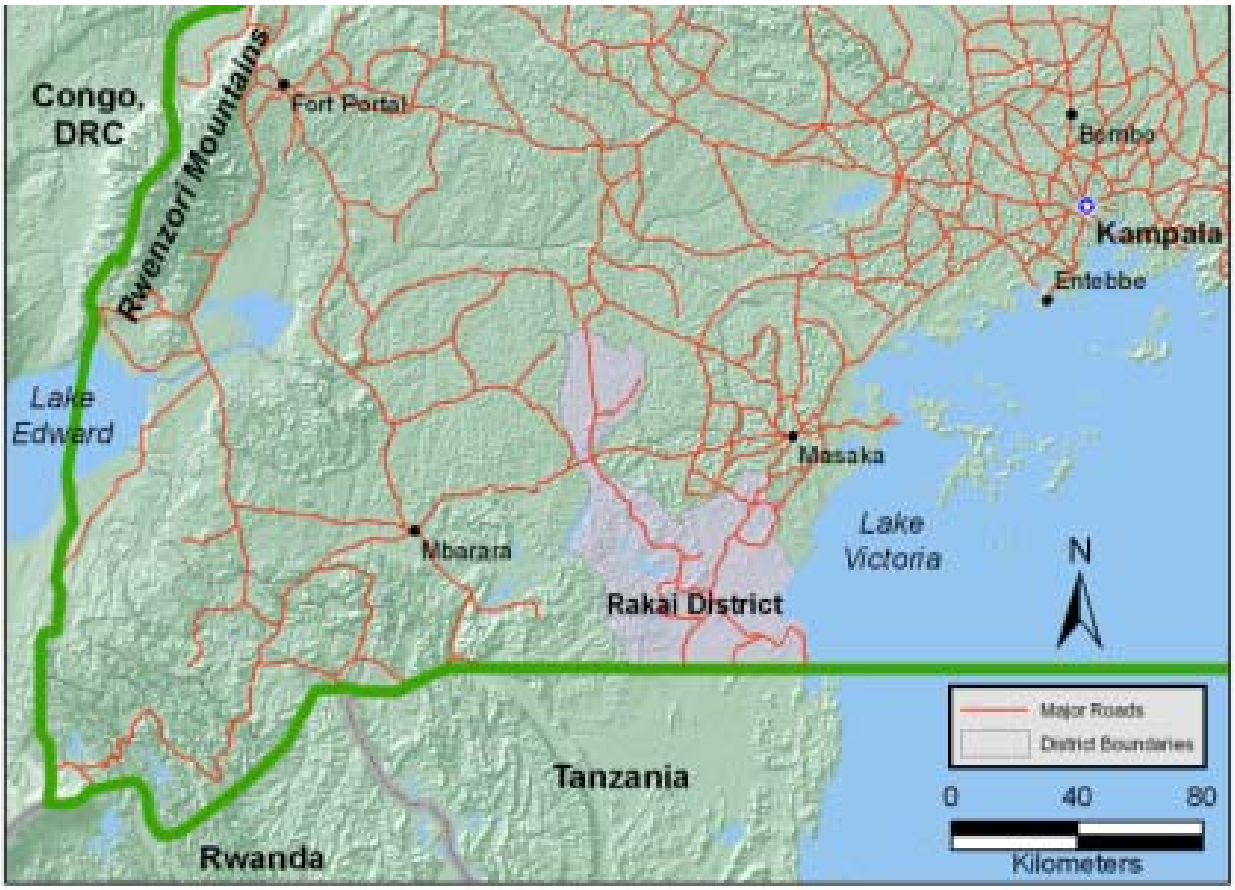

Figure 1: Research site in Uganda

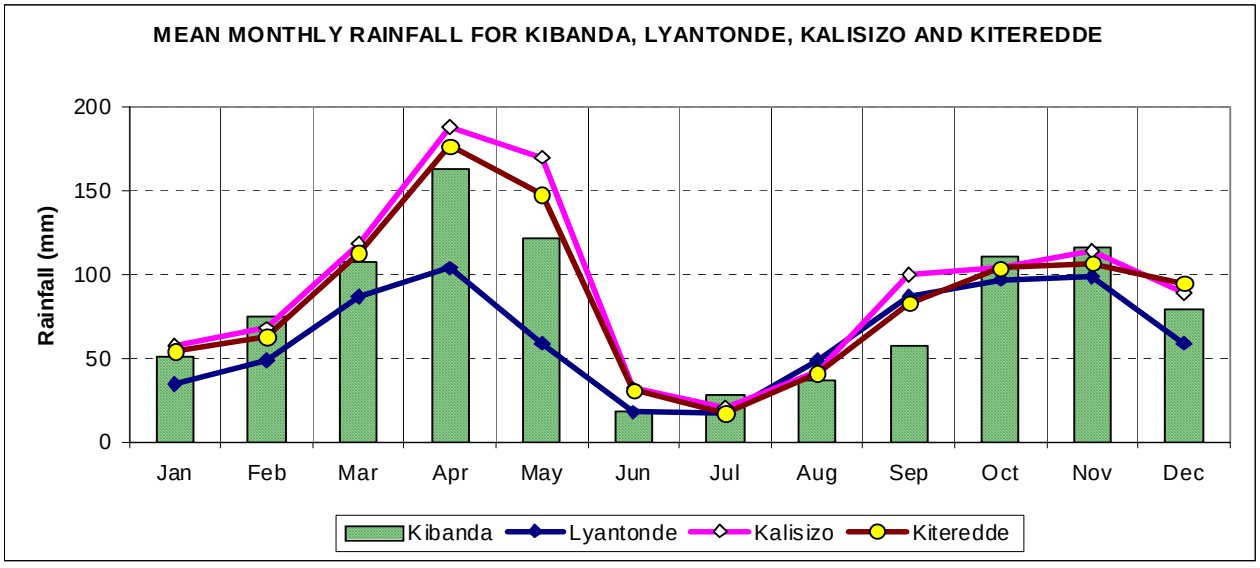

Figure 2: Average annual rainfall in research area

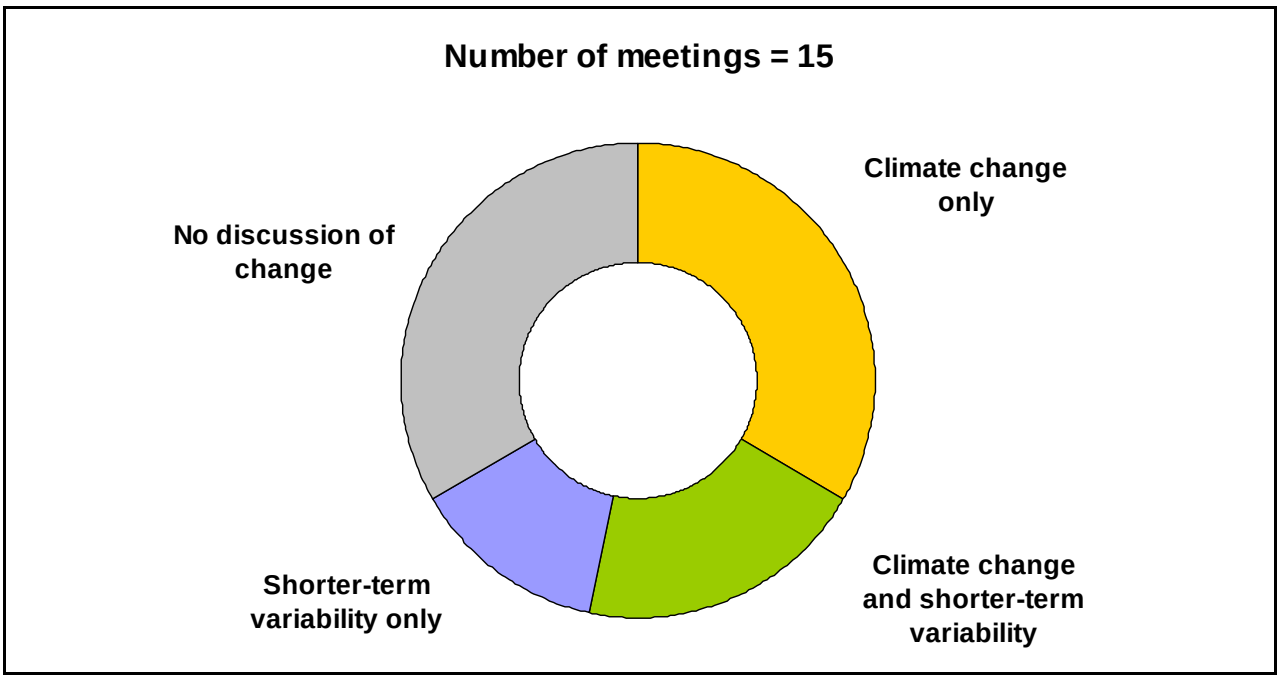

Figure 3: Frequency of discussion of climate variability and/or change in meetings

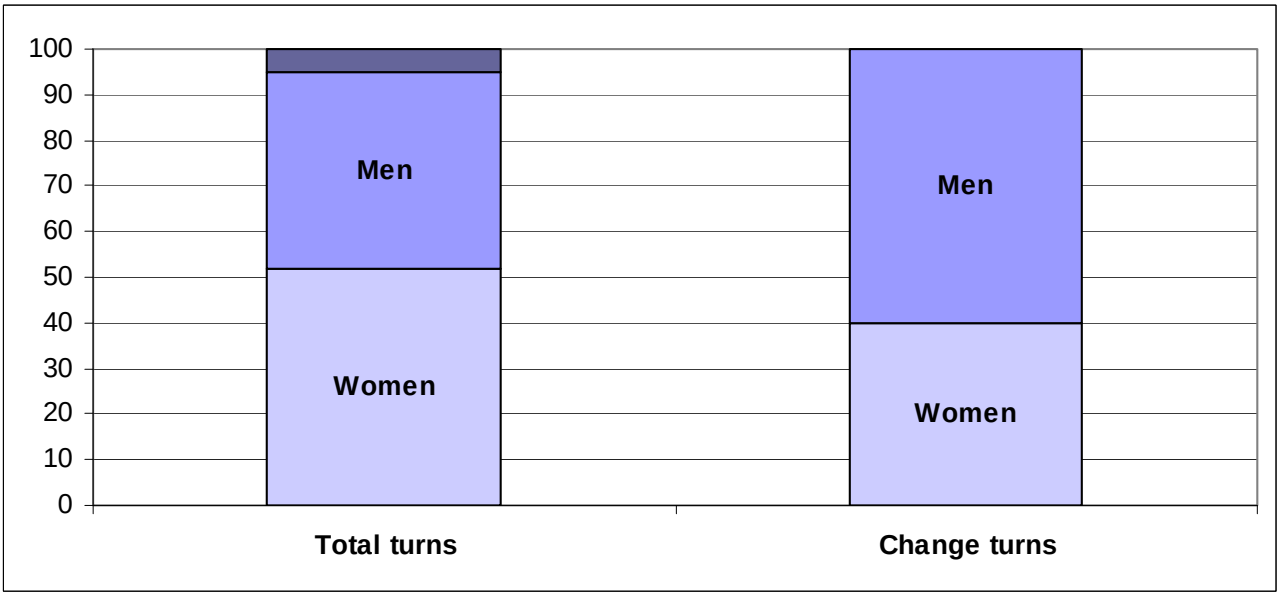

Figure 4: Distribution of “change” turns and total turns among men and women speakers

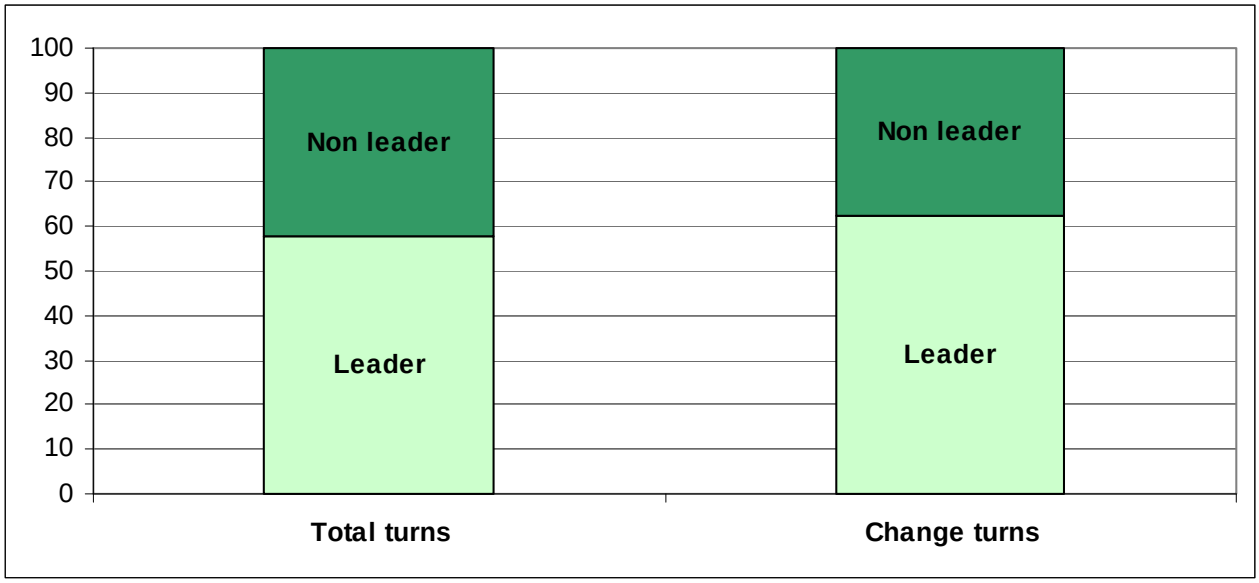

Figure 5: Distribution of “change” turns and total turns among leaders and non-leaders

	Onset of rain	Amount of rain	Duration of rain	Weather (general)	Accuracy of scientific forecasts	Accuracy of trad indicators	Tree and crop diseases	Planting time	**Total turns**
Variability	3	6	1	0	1	0	0	1	**12**
Change	11	7	1	3	0	2	4	0	**28**
Total	**14**	**13**	**2**	**3**	**1**	**2**	**4**	**1**	**40**

Table 1: Topics and parameters in group discussions of climate variability and change

Luganda term	English translation	Years	Years to decades	Decades	Decades to centuries
Bulijjo	Normally, commonly	**X**			
Kati	Now, currently	**X**			
Eyaliwo	Earlier, in the recent past	**X**			
Emyaka	Years, years ago		**X**		
luli	Before, formerly		**X**		
emabegako	Formerly, in the more distant past			**X**	
byafaayo	Historical narrative				**X**
ezzewo	The way things have always been				**X**
edda n'edda	Always, since time immemorial				**X**

Table 2: Luganda terms used to refer to the past