

Agro-pastoral farmers' perceptions of drought in Kayunga district, Uganda

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Abstract

Drought is an important factor affecting agriculture and livestock and the most constraining climate extreme to livelihoods. The study highlights agro-pastoral farmers' perceptions of drought in Kayunga district in central Uganda. The study employed a mixed methods approach and adopted a cross sectional research design. The study sample were 150 agro-pastoralists. Household questionnaires and interviews were used to collect the data and analyzed using descriptive statistics, Pearson correlation tests and narrative analysis. The study findings revealed that, majority households (99.3%) had experienced drought, (59.3%) attributed drought to forest and wetland degradation, (42%) reported low food production and low incomes during drought, and (80.54%) reported increasing drought in the area. Drought was largely described in social economic terms. Government should support agro pastoral famers create income generating activities for alternative livelihoods and also include their perceptions in planning for adaptation policies, strategies and programs.

Key words: Drought, perceptions, Agro Pastoral farmers, Uganda

Résumé

La sécheresse est un facteur crucial qui impacte l'agriculture, l'élevage et représente l'extrême climatique le plus contraignant pour les moyens de subsistance. Cette étude met en lumière les perceptions des agriculteurs agropastoraux face à la sécheresse dans le district de Kayunga, dans le centre de l'Ouganda. L'étude a adopté une approche mixte et a utilisé un design de recherche transversale. L'échantillon de l'étude comprenait 150 agro-pastoraux. Des questionnaires et des entretiens ont été utilisés pour recueillir les données, qui ont été analysées à l'aide de statistiques descriptives, de tests de corrélation de Pearson et d'une analyse narrative. Les résultats de l'étude ont révélé que la majorité des ménages (99,3%) avaient connu la sécheresse, que 59,3% attribuaient la sécheresse à la dégradation des forêts et des zones humides, que 42% signalaient une faible production alimentaire et de faibles revenus pendant la sécheresse, et que 80,54% indiquaient une augmentation de la sécheresse dans la région. La sécheresse était largement décrite en termes socio-économiques. Le gouvernement devrait soutenir les agriculteurs agropastoraux en créant des activités génératrices de revenus pour des moyens de subsistance alternatifs et inclure également leurs perceptions dans la planification des politiques, des stratégies et des programmes d'adaptation.

Mots-clés : Sécheresse, perceptions, agriculteurs agropastoraux, Ouganda

Introduction

Drought is an extreme and recurring event that affects the livelihoods of people around the world and is regarded as the most important disaster in economic, social and environmental terms (Gbetibouo, 2009). Of all natural hazards, drought is expected to become a more important factor affecting agriculture and livestock (Singh *et al.*, 2013). Drought and its characteristic extended period of moisture deficiency, greatly affects smallholder farmers especially in the developing countries whose livelihood principally depends on natural resource (Keil *et al.*, 2008; Stringeret *et al.*, 2008; Feras *et al.*, 2015). Drought destructs market access, trade and food supply, reduces income, depletes savings and erodes livelihoods (Ahmad *et al.*, 2013). In Africa, Small scale rural farmers have limited capacities to deal with the effects of drought, partly due to high levels of poverty (IPCC, 2007). In Uganda, drought is increasingly threatening local community livelihoods (Zizinga *et al.*, 2017). Kayunga district being part of the cattle corridor in Uganda experiences drought. (Kayunga DDP, 2016). Over 98% of the local community depend on rain fed subsistence agriculture and natural resources for livelihoods (NEMA, 2014). The occurrence and severity of drought is perceived to be triggered by widespread deforestation, wetland degradation, high dependence on rain-fed agriculture and limited application of adaptation inputs (Malhi *et al.*, 2008; Silvestrini *et al.*, 2011; Islam and Sato, 2012). The study examined agro pastoral farmers' perception of drought in Kayunga district in central Uganda.

Methodology

Study area description. The study was conducted in Bbaale and Galiraya Sub counties in Kayunga district in central Uganda. Kayunga District has a total population of 368,062 people. Galiraya has 26,820 people and Bbaale has 16,661 people (UBOS, 2014) with majority 98% involved in agriculture and 96% are agro pastoralists. The climate is varied. The southern part has tropical climate and the northern part has savannah climate with average annual rainfall ranging from 35-126 mm (Kayunga DDP, 2016). The annual average temperature is 21.50 C (Climate-Data-Org, 2019). The district is drained by River Nile, lake Kyoga and Sezibwa wetland. The vegetation is predominantly savannah with short grasses and thorny bushes. The soils are generally black loamy (Kayunga DDP, 2016).

Research design. The study employed a mixed methods approach and adopted a cross sectional research design. The study drew on both qualitative and quantitative data. The study sample comprised of 150 agro-pastoralists as primary respondents. Snowball sampling procedure was used for house hold respondents and purposive sampling for key informants, and household questionnaires and interviews were the data collection methods. The data generated were analyzed using descriptive statistics using Statistical Package for Social Scientists (SPSS- version19) using frequency tables, graphs and Pearson correlation tests to determine the relationship between drought experience and household social economic and demographic characteristics and ATLAS.ti. for narrative analysis.

Results

Socio-economic and demographic characteristics of respondents. The study findings revealed that most of the respondent households (74.7%) were farmers. In terms of sex, age and marital

status, most of the respondents were female (59.3%), aged below 60 years (91%) and married (83.3%). The study also revealed that most of the respondent households (80.7%) had less than 10 people. In terms of household income, majority respondents' income (42%) ranged between 1,000,000 and 2,000,000 Uganda Shillings (1 US\$=3700Ug. Shs). Majority of the respondents (56.7%) had attained primary level education and (59.3%) Anglican. Majority (58.7%) owned land although most of them (40%) did not know the land tenure system under which they were operating. Most of the respondents (55.3%) were smallholders who operated on less than one hectare of land and majority (28.7%) stayed in the area between 1 to 10 years.

Drought experience. The majority of respondents (99.3%) reported that they had experienced drought. The majority of respondents (32%) reported that the drought period normally lasts for 5 months. The respondents also reported that they had experienced drought at various times with 2018 being the worst period. This finding is not surprising since earlier studies of Mfitumukiza *et al.* (2017) had reported drought in the cattle corridor.

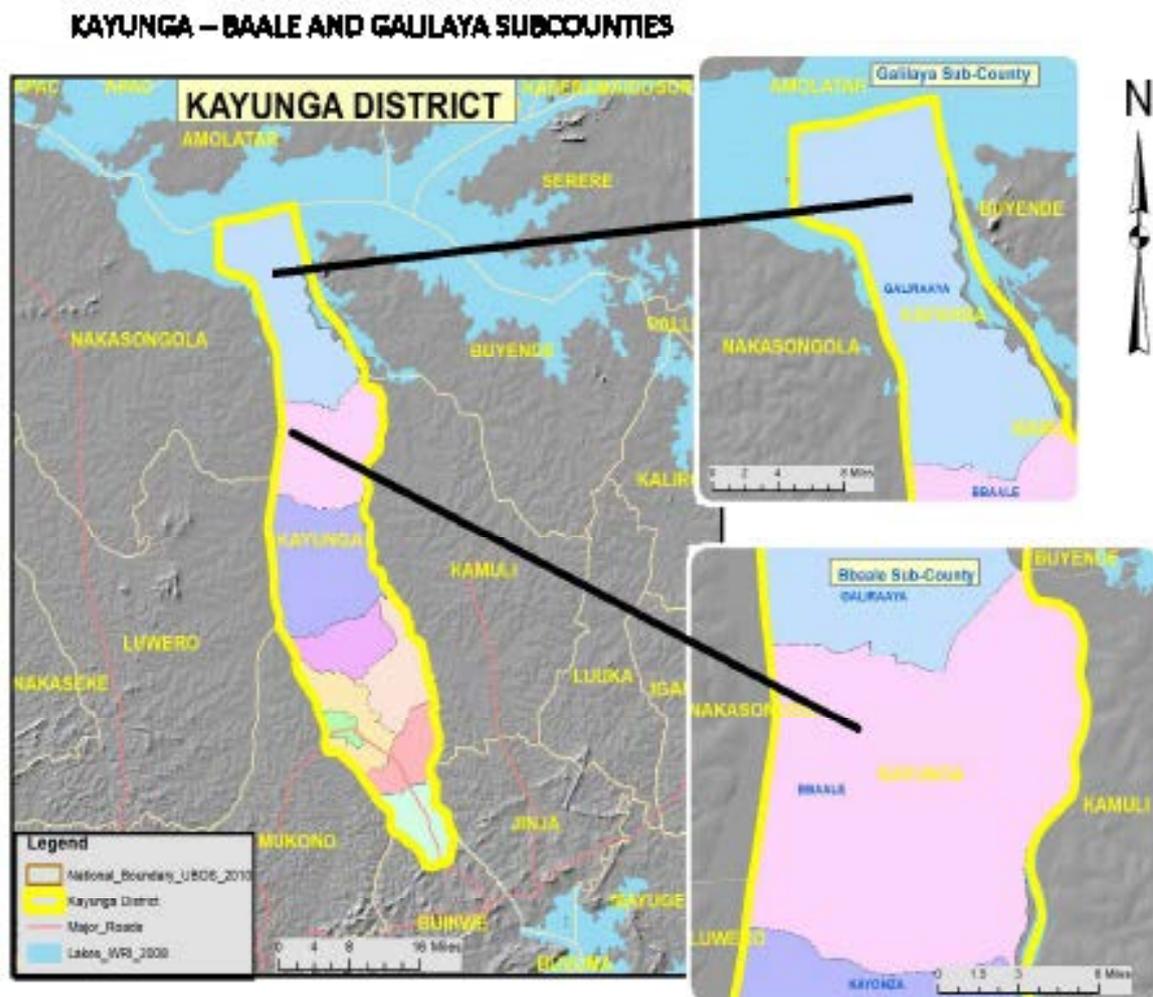


Figure 1. Location of the study area on the map of Uganda
Source: Kayunga DDP (2016)

Table 1. Socio-economic and demographic characteristics of the respondents

Variable	Category	Frequency	Percentage (%)
Occupation	Farmer	112	74.7
	Pastoralist	3	2.0
	Civil servant	5	3.3
	Business man/woman	14	9.3
	Agro-pastoralist	16	10.7
	Total	150	100
Sex	Male	89	59.3
	Female	61	40.7
	Total	150	100
Age	20 years and below	7	4.7
	21 – 30 years	35	23.3
	31 – 40 years	39	26
	41 – 50 years	32	21.3
	51 – 60 years	31	20.7
	61 years and above	6	4
Total	150	100	
Marital Status	Single	17	11.3
	Married	125	83.3
	Widowed	7	4.7
	Divorced	1	0.7
	Total	150	100
Education level	Primary	85	56.7
	Secondary	21	14.0
	University	2	1.3
	Tertiary	4	2.7
	No education	38	25.3
	Total	150	100
Household income	Less than 1,000,000	49	32.7
	1,000,001-2,000,000	63	42
	2,000,001-3,000,000	18	12
	3,000,001- 4,000,000	9	6
	4,000,001- 5,000,000	3	2
	5,000,001and above	8	5.3
	Total	150	100
Religious affiliation	Islam	23	15.3
	Anglican	89	59.3
	Catholic	25	16.7
	Pentecostal	11	7.3
	Seventh Day Adventist	2	1.4
	Total	150	100
Land ownership	Yes	88	58.7
	No	62	41.3
	Total	150	100
Land tenure system		18	12.0
	Customary land	28	18.7
	Milo land	43	28.7
	Freehold land	1	0.7
		1	40.0

	Leasehold	60	100
	Don't know	150	
	Total		55.3
Land size		83	38
	less than 1 acre	57	4
	1 – 10 acres	6	0.7
	11 – 20 acres	1	1.3
	21 – 30 acres	2	0.7
	31 – 40 acres	1	100
	41 acres and above	150	
	Total		32.7
Household size		49	48
	Less than 5 members	72	15.3
	6 – 10 members	23	2.7
	11 – 15 members	4	1.3
	16 – 20 members	2	100
	21 members and above	150	
	Total		2.7
Duration of stay in area		4	28.7
	Less than 1 months	43	24.7
	1 – 10 years	37	16.7
	11 – 20 years	25	17.3
	21 – 30 years	26	5.3
	31 - 40 years	8	4.6
	41 – 50 years	7	100
	51 years and above	150	
	Total		

Source: Primary data (2018)

Relationship between drought experience and socio-economic and demographic characteristics of respondents. The study findings revealed that occupation ($r=-0.045$), sex ($r=-0.068$), education levels ($r= -0.061$), land ownership ($r= -0.069$), land tenure system ($r= -0.077$) and household size ($r= -0.105$) had weak negative correlations with drought experience while marital status ($r= 0.010$), religious affiliation ($r= 0.079$) and length time respondents had lived in the area ($r= 0.040$) indicated weak positive correlations.

Table 2. Correlation between drought experience and socio-economic and demographic characteristics of respondents

Variable	Pearson correlation coefficient
	(r)
	1
Main occupation of respondent	-0.045
Sex of respondent	-0.068
Marital status of respondent	0.010
Education level	-0.061
Religious affiliation of respondent	0.079
Land ownership	-0.069
Land tenure system	-0.077
Size of household	-0.105
length of time in the area	0.040

Source: Primary data (2018)

Causes of drought. The majority of respondents (59.3%) reported that forest degradation was the major cause of drought. Some respondents (23.3%) reported that trees were mainly cut for charcoal production. Some respondents (11.1%) reported that sugarcane growing was another cause of drought, particularly in Bbaale. It was reported that sugarcane farms had been established in areas where forests and wetlands formerly existed. For example, Mehta and Madhvani Companies had cleared 1,600 square miles of land for sugarcane growing in the study area. As one key informant (Agricultural Extension Officer) noted: *“there are also some individual sugarcane out grower farmers who have also cleared their land to plant sugarcane. The trees which were cleared by the companies and individual farmers were used for charcoal production and firewood. However, no replanting has been done hence escalating the drought conditions in this area”*.

Drought occurrences and trends. The study findings indicate that 0.67% of the respondents reported a constant decrease in drought conditions between 2007 to 2015. However, between 2015 and 2017 respondents (8.72%) reported a slight increase: whereas the majority (80.54%) respondents experienced extreme conditions in 2018. As one key informant noted: *“During the 1990s the wet seasons were evenly distributed into two long seasons of about 4 months each season which is not the case today where the rain season is certainly unpredictable”*. IPCC (2007) reported increased drought occurrence among the African nations which are experiencing the worst consequences due to high exposure and limited adaptation capabilities.

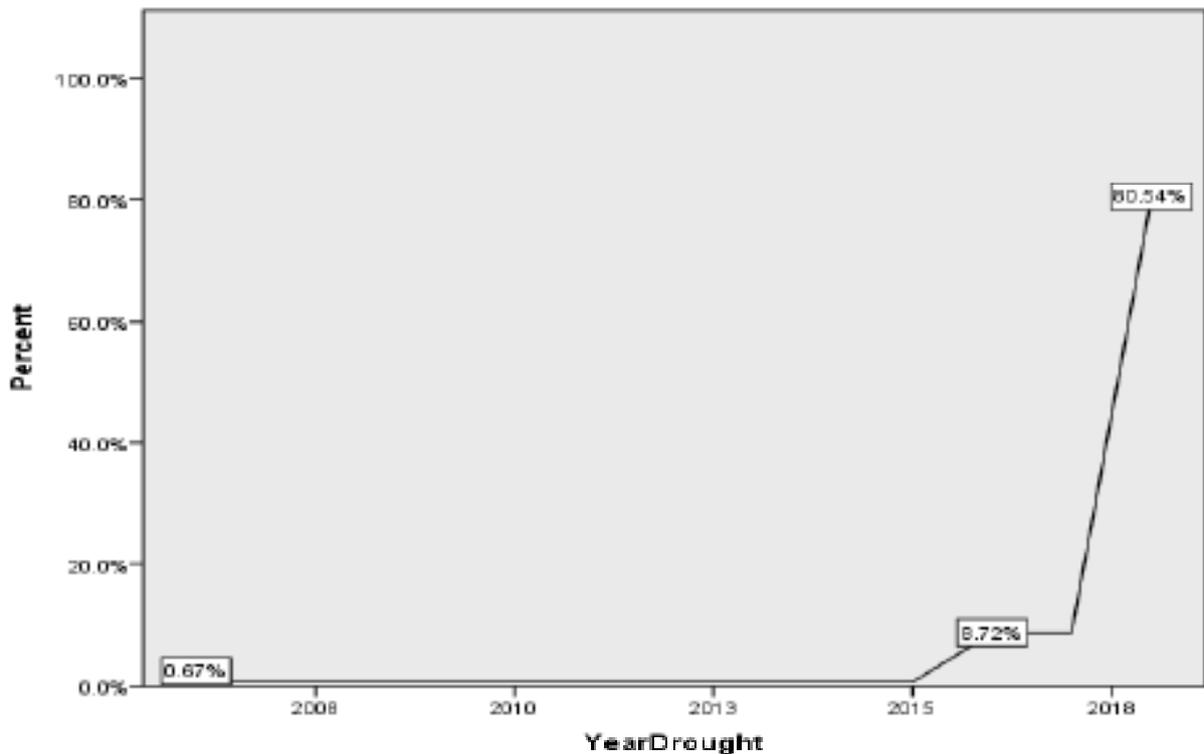


Figure 2. Drought occurrence and trend in the study area

Effects of drought on agro pastoral households. The majority of respondents (90%) reported that their households had been affected by drought. The findings concur with Mfitumukiza *et al.* (2017) who reported that the study area has a history of prolonged drought since the early 1980s. Some respondents (42%) reported that during drought periods, they experienced low food output and low incomes noting that food becomes expensive amidst limited purchasing power. The findings are consistent with those of Zizinga *et al.* (2017) who noted that sudden increase in temperatures create a fundamental problem for farmers who seek to maximize seasonal farm yields, hence a decline in yields and a decrease in household incomes.

Conclusions and recommendations

The study examined agro pastoral farmers' perceptions of drought in Kayunga district in central Uganda. The study established that majority of households had experienced drought. The study findings also revealed that drought conditions increased between the year 2015 and 2017 with extreme conditions faced in 2018. The majority of respondents attributed drought conditions to deforestation for charcoal burning, large scale sugarcane plantations and wetland conversion. Drought resulted in low food production and low household incomes. The study findings further reveal that most of the social economic and demographic characteristics were weakly related to drought experience.

Drought in the study area is largely described in social economic terms. The effects of drought were largely based on agricultural production and income levels. Agro pastoral farmers relied largely on their past and present observations to describe drought occurrences and trends. Agro pastoral farmers reported increase in drought occurrence between 2015 and 2018. According to IPCC (2007) there is an increasing evidence that the frequency of drought in the world is increasing and Africa experiences the worst consequences due to high exposure and low adaptive capacity. Although agro pastoral farmers clearly perceived the changes in drought, they are struggling to adapt to these changes. It is therefore important for governments to support agro pastoral farmers create income generating activities for alternative livelihoods during the dry spell that would boost their incomes and wellbeing. It is also important to include agro pastoral farmers' perceptions in adaptation policies, strategies and programs streamlined by government and NGOs and strengthening policy actions through making ordinances and by laws at sub county and district level on conversion of forests and wetland to sugarcane plantations.

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