



Impacts of Climate Change on Men and Women in Kapchorwa and Manafwa Districts, Eastern Uganda

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1. Abstract

This paper investigates the impacts of climate change on men and women in the Mt. Elgon districts of Kapchorwa and Manafwa. Rapid rural appraisal and household survey methods were used to elicit information on patterns of climate change shocks, perception of vulnerability, impacts and adaptation strategies. The results indicated that while the impacts of climate change may be similar between men and women in general contexts, vulnerability to climate change is contextual and varies between men and women. Men and women's perceptions of the impacts are also different and the adaptation strategies adopted by households in respect to the changes in climate are gendered and unsustainable. It is therefore recommended that climate adaptation policies and programmes aimed at promoting climate-smart adaptation interventions need to be tailored in recognition of the vulnerability perceptions and the differential gender roles, if men and women's resilience to climate shocks is to be enhanced.

Keywords: *Adaptation, Climate change, Gender, Vulnerability, Impacts*



2. Introduction

Gender refers to a relational concept, which describes how men and women by virtue of their socially constructed differences relate to the phenomena around them (Hazel and Barden, 2000). Women and men are not homogenous groups but include people of various age, ethnicity, education and income. These socioeconomic categories also relate to how people are impacted by climate change and which possibilities they possess to adapt (Röhr and Hemmati, 2007). Climate change impacts are distributed differently among regions, generations, age classes, income groups, and occupations and as well as between women and men (McCarthy, 2001; Denton, 2002; Nellemann et al., 2011; Goh, 2012). This therefore means that any meaningful gender analysis of climate change should consider the differences between men and women (McOmber et al. 2013; Jost et al. 2015.) in order to provide key information needed for policy and programme development (Kristjanson et al. 2014).

The impacts of climate change may differ among individuals, families and communities depending on local cultural and gender norms (Twyman et al. 2014). Cultural rules determine the gender identity, expression, and roles played by men and women regarding who does what and who controls the benefits from different activities. The behaviour patterns and activities carried out by women and men, young and old, rich and poor differ (Verma, 2001; Otiso, 2006; Nielsen and Reenberg. 2010). The difference in the behavioural patterns is due to the social characteristics as shaped by the gender relations that in turn reinforce their vulnerability to climate change (Adger et al. 2009; Nelson and Stathers, 2009). In order to develop climate adaptation strategies that address the location specific vulnerabilities and are context specific, there is need to understand how men and women are affected by climate change in climate sensitive communities (Twyman et al. 2014; Jost et al. 2015).

In Uganda, climate change is observed and manifested in the increase in frequency and intensity of weather extremes including unusually high temperatures leading to prolonged droughts and erratic rainfall patterns (Hisali et al. 2011; MWE, 2013a; Kansime, 2012). Consequently, this has led to an increase in the frequency of climate change shocks such as droughts, floods, land/mudslides and frequent incidences of thunderstorms, lightening and hailstorms (Kitutu 2010; NEMA 2010; Mbogga, 2012; MWE, 2013b Bomuhangi et al., 2016). All these impacts are livelihood threats with significant gender implications due to the different roles, needs, capacities and positioning of men and women in society.



Addressing the threat of climate change in Uganda through adaptation and mitigation strategies is a current national priority as clearly stipulated in the NDP II (GoU, 2015) and Uganda vision 2040 (GoU, 2013). There is a broad consensus among development partners that climate change is best addressed by targeting those that are directly impacted (DAW, 2008; World Bank et al. 2009). However, the current climate adaptation responses undertaken by the government of Uganda are more broadly focused (Kansiime, 2012) and have not taken effort to understand local conditions that shape adaptation. Gender studies needed to realize specific adaptation practices undertaken by men and women in Uganda and particularly in the Mt. Elgon region are still scarce. Without an understanding of how climate change differentially affects men and women and how they respond to the impacts, it is difficult to address the full set of potential impacts of climate change at both the national and sub-national levels. Lambrou and Piana (2006) call for studies focusing on gender and climate change to be conducted at the micro level in order to gather disaggregated data that is needed for formulation of effective policies or adaptation options. This study examines how men and women are affected by climate change in two districts within the Mt Elgon region of eastern Uganda. This is important if gender relations are to be deconstructed and reordered in a manner that ensures that climate change interventions respond to the specific needs of the persons affected.

The specific study objectives were to;

- (i) Examine the men and women's perception of vulnerability to climate change
- (ii) Assess the impacts of climate change on men and women
- (iii) Determine the men and women's adaptation strategies to climate change



3. Materials and methods

3.1 Description of the study area

The research was carried out in Kapchorwa (latitude 1070 N, 10360 N and longitude 340 180 E, 340 480 E) and Manafwa districts (latitude 10880 N, 330330 N and longitude 340 330 E, 330 330 E) in the Mt Elgon region of eastern Uganda. The two districts are characterized by mountainous terrain and their climate is influenced by altitude (NEMA, 2008). The mean annual temperature in the districts ranges from 21-23oC in the low elevation areas in the east to 15-16oC in the high elevation areas in the west with average maximum temperature of 28oC. The rainfall pattern is bimodal, with two rain seasons. The first (main) rainy season starts at the end of March and stretches to end of May. The second (“short”) rainy season starts around June and continues to August or even October in some locations (Mbogga, 2012). Subsistence agriculture and livestock farming are the major occupations employing more than 80% of the population (MFEP, 2014). The major crops grown at high altitudes include banana, arabica coffee and Irish potatoes, while at lower elevations the dominant crops are maize, millet, cassava, beans and sweet potatoes, cabbage and tomatoes (Kansiime, 2012; Mbogga 2012). The districts were selected purposively based their acute vulnerability to climate change (MWE 2013). The mid to high elevation areas have had landslides, siltation of rivers as well as washing away of top soil, which depletes soil nutrients hence affecting agricultural yields (Kitutu 2010; Mbogga, 2012).

The study was conducted in four sub-counties, two from each district depending on fragility and sensitivity to climate change. From each sub-county, one parish, three villages per parish and between 16- 18 households per village were selected making a total of 211 households that were interviewed during the survey. Of all the four parishes situated along the slopes of the Mt. Elgon, Chemamanga had the highest elevation while the other three (Maalo, Kapnarwaba and Bunasambi) were mid slope communities.

3.2 Data collection methods

Data collection relied on a mixed methods research approach. Rapid rural appraisal methods (Chambers, 1994) and a household survey were used to elicit information on patterns of climate change and its associated risk from different segments of the community. Data was collected in two phases



between March 2012 and December 2012: Phases one employed the PRA methods, while phase two focused on in-depth interviews with selected participants.

In the first phase, one Focus Group Discussion (FGD) session disaggregated by sex was held in each of the parishes of Maalo, Kapnarwaba and Chemangang while two FGD sessions disaggregated by sex were held in Bunasambi parish, at two different locations. This was because of the differences in population density, in that while the other three parishes were composed of 5-7 villages, Bunasambi had a total of 11 villages. The FGD sessions had an average of 12 persons each. The selection of the focus group participants was based on random sampling using a list of all households in the village. Effort was made to ensure that no household participated in more than one focus group. A PRA protocol designed based on literature and expert consultations was used to collect capture the gendered perceptions of vulnerability, perceived impacts and adaptation strategies.

In the second phase, two hundred eleven households randomly selected from a list of households in the study villages were interviewed. Within each household, sex-disaggregated data (i.e. from one male and one female decision-maker) was collected. The decision makers in the households were considered to be either the head of household (male/female) or their spouses. In total 422 respondents were selected from Manafwa and Kapchorwa district following a simple heuristic method described by Krejcie and Morgan (1970). The household survey adopted semi-structured individual interviews and were conducted in the local language used in the two districts. Data was collected on the perceptions of climate change, impacts of climate change shocks as well as the coping and adaptation strategies to changes in climate. While 422 respondents were interviewed only 420 (204 Kapchorwa and 216 Manafwa) were considered for analysis. Two respondents were dropped for inconsistent data.

3.3 Data analysis

Descriptive statistics were used to analyze quantitative data. Cross-tabulations were used to generate Pearson Chi-Square (χ^2) values which were used to test any association between the men and women's perception of climate changes, perceived impacts of climate change, perceived vulnerability and reason for vulnerability, the primary household coping and adaptation strategies as well as the desired adaptation strategies in the advent that the changes in climate continue. Thematic analysis was to



identify, analyse, and report patterns /themes (nature of climate change, vulnerability to climate change, and gender differentiated impacts of climate change and coping and adaptation strategies) within qualitative data using Nvivo 10 (Bazeley and Jackson, 2013). A hierarchal coding scheme was developed to reflect the key research questions (is vulnerability to climate change gendered? how are men and women impacted by climate change? how do women and women respond to climate change?) which were further shaped by themes that emerged from the responses. Theoretical thematic analysis was used to identify themes that emerged from the data. A range of advanced coding queries were used to analyse nuanced gendered patterns in the data in order to interpret men and women's underlying ideas about impacts of climate change and the level of vulnerability. The results from the qualitative analysis were used to further interpret and qualify the outputs of the quantitative analysis.



4. Results

4.1 Nature of climate change

Men, women and youth's perception of climate change at community level (Parish) revealed that, while all the men, women and youth reported similar or identical observations of temperature and precipitation trends over time, when asked about the associated climatic events for the period 1993-2013, men and women reported similar events but with differences in emphasis of frequency and severity of the event in all the parishes. Men more often highlighted frequent and severe droughts whereas women more often referred to extended rains. Additionally, women in comparison to men easily recalled the climate variability events that occurred in the communities with much certainty on the periods of occurrence. Further the analysis indicates a link between perceptions and gender roles/activities. Men and women were more likely to perceive climate related variability that more directly affected their social roles/activities probably due to their struggles to fulfill their responsibilities/ obligations in society. In this regard, women's traditional role of ensuring food availability in the household as well as collection of water for household use made them more interested in observing rainfall patterns as availability of water is greatly affected by rainfall patterns.

4.2 Men and women's perceived vulnerability to climate change

While there were gender differences in perception of the nature of climate shocks reported in Kapchorwa and Manafwa districts, women and men in these districts may or may not experience such climatic shocks in a similar manner. Data at community level from sex disaggregated focus group discussions suggested that the degree of vulnerability to climate change is different for men and women. When asked about how vulnerable they were to climatic shocks, men perceived themselves to be more vulnerable in comparison to women. They argued that since their livelihoods depended more on agriculture, they lost income as a result of crop failure. This situation deprived them of income that they needed to secure survival for their families as heads of households. Discussion with one of the resource persons in Manafwa revealed that:



“Climate change is making survival harder for families, the role of men in society is undermined creating social problems. If you cannot provide for your family, you are robbed of your self-esteem and to men this is the greatest asset they cannot afford to lose.” (43 year old Male).

This situation conditions their perception of vulnerability. However, contrary to the men’s perception on the extent of vulnerability to climatic shocks, the women who participated in the FGDs argued that women were the most vulnerable to climatic shocks. They argued that, since it is their role and responsibility to ensure household food security, they had to work harder to find the means and resources to sustain their household’s food supply while making sure that all other needs were being met. Because women are the main providers of food for their families, women may bear a greater burden to fulfill this task when climate events occur. It was observed that women were engaged in both productive and reproductive activities. Among the reproductive activities included cooking meals for the entire family, as well as collecting water and firewood while the productive works included growing of vegetables for commercial purposes. Women added that as a result of the multiple and extra workloads, they tend to work longer hours than men and, therefore bore most of the burden of the effect of climate shocks. The extra time burdens women in executing both the reproductive¹ and productive² activities tend to exacerbate gender inequities and vulnerability within communities. This was evident as one of the resource persons confirmed that:

“Men here have relegated their duties to us. Most of them spend their time in trading centres either drinking or engaging in gambling. It is even worse for the young men. We do all the work, we go to the farms, take care of the children and all that is needed at home. It is now very rare in our communities to find men who are fully engaged in

¹ Reproductive activities refer to all activities necessary for the maintenance of human life: Examples include cooking, looking after and educating children and bearing children (ILO, 2008)

² Productive activities refer to all activities related to production of goods for consumption or trade and income generating activities (ILO, 2008)

sustaining their households. The entire burden is left to us the women.”(32 year old Female, Manafwa)

These dynamics condition men and women’s perception of vulnerability differentially. In order to qualify the gendered perceptions of vulnerability at community level, an in-depth analysis of gender differentiated vulnerability was further established by seeking the perceptions of both the male and female decision makers within a household. The male respondents perceived the male adults as the most vulnerable individuals (69% Manafwa and 58% Kapchorwa) as compared to the females (Table 1). On the other hand, the female respondents considered themselves the most affected (78% Manafwa and 65% Kapchorwa), they however reported relatively more adult males (44% Manafwa and 46% Kapchorwa) as compared to the numbers reported by the males. A contestation is observed among the male and female on who is affected more by climate change. Both men and women reported lower numbers of children/youth/aged as the most vulnerable individuals to climatic shocks in Manafwa (9% Male, 15% Female) and Kapchorwa (7% Male, 4% Female). These were on the basis that that these categories of people are often dependent on the adult men and women in cases climate shocks occur and would experience secondary effects. Men and women’s perceived degree of vulnerability in Manafwa ($X^2 = 75.22$, $DF = 4$ P-Value = 0.003) and Kapchorwa districts ($X^2 = 50.14$, $DF = 4$ P-Value = 0.004) were significantly different.

Table 1: Perceived vulnerability in Manafwa and Kapchorwa

Perceived vulnerability	Percentage of respondents (%)			
	Manafwa		Kapchorwa	
	Male	Female	Male	Female
Male adults	69	22	58	35
Female adults	44	78	46	65
Children/youth/aged	9	15	7	4

To understand, why vulnerability was different at household level within the districts, the study sought for the reasons on which both the male and female decision makers within the household based their vulnerability perceptions (Table 2). While men reported lack of alternative sources of livelihood (76% Manafwa and 68% Kapchorwa) as the major reason for perceived vulnerability, the women reported

having multiple responsibilities (65% Manafwa and 57% Kapchorwa). This finding further seems to link vulnerability to climate shocks with the different gender roles as observed at the community level. Men relate more with productive gender roles while women relate more with reproductive roles although women tend to engage in both. Men and women's reasons for perceived vulnerability in Manafwa were significantly different ($X^2 = 76.72$, $DF = 4$ P-Value = $1.6E-06$), while in Kapchorwa, the reasons for perceived vulnerability were not significantly different ($X^2 = 16.15$, $DF = 4$ P-Value = 0.12).

Table 2: Reasons for perceived vulnerability in Manafwa and Kapchorwa

Reason for perceived vulnerability	Percentage of respondents (%)			
	Manafwa		Kapchorwa	
	Male	Female	Male	Female
Lack of alternative livelihood options	76	34	68	32
Multiple responsibilities	22	65	34	57
Limited assets as safe guards to shock	54	48	32	23
Poor health that constrains production	28	43	34	41
Limited mobility/aged/young	14	10	18	20

4.3 Gender differentiated impacts of climate change

At the community level, climate change shocks were reported to have negative impacts on livelihoods such as food security and health. According to both the male and female focus group discussions, intense rainfall induced hailstorms and mudslides consequently contributing to loss of crops, livestock and infrastructure such as houses. Community members in the Manafwa study sites could recall a mud slide in 2011 that damaged several houses, killed livestock, damaged a number of hectares of land and rendered some people homeless. Both men and female focus group discussions reported that as a result of long-term changes in temperature and rainfall patterns experienced in the study sites, the yield and production of key crops such as maize had drastically decreased. This finding was qualified by a key resource person in Kapchorwa who reported that:

“Kapchorwa used to be a food basket for Uganda; we produced all types of food to feed the country such as: maize, beans, wheat, cabbages, carrots, passion fruits



and so on. However, this has changed. The production has gone low in the last 15 years. People say it is the soils that have lost their fertility due to over use. But even when you use fertilizers which many people do use here, the production is still poor. The seasons are no longer good, the rains are erratic and their duration has shortened.” (56 year old Male)

The focus group discussions further revealed that as a result of the declined yields, there was an increase in prices of both on-farm and off-farm products due to food insecurity. Many of the community members had resorted to purchasing food to supplement the food grown at home, which never used to be the norm in the districts. This increased demand for food items has led to increased prices of these same items. Further, increased incidences of malaria were reported which greatly affect the family health and thus the productive activities. This was attributed to a rise in temperature in the region in the recent years which favours the breeding of mosquitoes. However, across the community meetings and focus group discussions, there seemed not to be a clear line between who amongst men and women was impacted most by climate change.

Household data revealed that crop failure, increased price of on farm and off farm food products, assets loss and decreased family health were the most commonly reported impacts of climate change by both men and women (Table 3). It is however observed that while crop failure, asset loss and decreased family health are primary level impacts, increased price of off farm food products is a secondary level impact. The fact that increased price of off-farm food products was reported with primary level effects could explain the magnitude of the effect on the communities in the study area.

In both study sites, crop failure was predominantly reported by both men and women. However there seemed to be a gender disparity in Kapchorwa with slightly more women reporting crop failure as opposed to men. Women seemed to suffer most from the effect of food shortage since they are responsible for ensuring that their families and especially children have food. Although household asset loss was reported in both sites, women reported greater asset loss as compared to men (Table 3). The asset loss disparity was even wider in Kapchorwa (21%) as opposed to Manafwa (15%). Some of the assets lost included death of livestock and poultry as a result of exposure to hailstones. While the incidence of decreased family health was relatively common among both men and women (70-71%) in Kapchorwa, there was a gender

disparity with more women (56%) reporting decreased family health as compared to men (42%) in Manafwa. This could signal that the impacts of climate change could be related to gender roles. Due to the difference in the work men and women do, they are impacted by changes climate in different ways. It was observed that, women tend to be keener as opposed to men in observing changes in family health since they are the ones caring for the sick so an increase in the incidence of illness increases their time burden. Least reported impacts by both men and women included loss of wage employment and increased wildlife predation (Table 3).

Table 3: The impacts of climate change on men and women in Manafwa and Kapchorwa

Climate variability impacts	Percentage of respondents (%)			
	Manafwa		Kapchorwa	
	Male	Female	Male	Female
Increased crop failure	100	99	95	100
Increased price of consumer goods	72	100	81	100
Household asset loss	60	75	36	57
Decreased family health	42	56	70	71
Decreased animal production	46	42	49	66
Poor access to markets / health services and schools	20	32	31	28
Loss of farming land	14	17	13	16
Loss of wage employment	12	10	5	14
Increased wildlife predation	5	7	6	5

Despite these differences, men and women's impacts of climate change in Manafwa ($X^2 = 6.40$, $DF = 8$ P-Value = 0.78) and Kapchorwa districts ($X^2 = 9.82$, $DF = 8$ P-Value = 0.39) were not significantly different.

4.4 Household coping and adaptation strategies

Men and women's coping and adaptation strategies implemented in the study sites were investigated (Table 4). More women as compared to men in both districts reported diversifying crop and livestock production, and reducing household spending on non-essential activities to ensure sustainable food

supply. More men reported seeking assistance from friends, relatives and institutions, and spending cash savings primarily to purchase food or invest in agriculture such as buying new seed and fertilizer and (Table 4). About 12% of men in Manafwa and 16% Kapchorwa and about 8% of women in Manafwa and 5% Kapchorwa had no adaptation and coping mechanisms in response to changes in climate. These attributed their non-action to not knowing what to do, the lack of funds to implement changes and/or insufficient climate information to inform adaptation. The sex-based difference in the coping/adaptation strategies significantly differed between the responses for the men and women in Manafwa ($X^2 = 74.22$, $DF = 9$ P-Value = $2.991E-06$) and Kapchorwa districts ($X^2 = 64.55$, $DF = 9$ P-Value = $3.35653E-07$).

Table 4: Household coping and adaptation strategies in Manafwa and Kapchorwa

<i>Coping and adaptation strategy</i>	<i>Percentage of respondents (%)</i>			
	<i>Manafwa</i>		<i>Kapchorwa</i>	
	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>
<i>Coping strategy</i>				
Seek financial and non-financial assistance	89	56	78	54
Reduce household spending on non-essential activities	56	73	60	71
Spend cash savings primarily to purchase food or invest in agriculture	63	40	73	60
Harvest more wild products	10	16	24	35
Rent agricultural land to increase crop production	46	38	50	30
Sell assets such as livestock	80	30	73	22
<i>Adaptation strategy</i>				
Diversify crop and livestock	78	89	81	90
Seek informal/formal employment as source income to purchase food	46	64	38	52
Seek new source of livelihood such as trading	15	6	18	8
Did/do nothing in particular	12	8	16	5

The desired strategies for adaptation strategies are summarized in in table 5. More women (96 Manafwa and 90% Kapchorwa) desired to diversify their crop and livestock in order to increase the agronomic and economic benefits. In addition to spreading risk in the event of future climate risk, changing planting dates after understanding the changes in climate and setting up food storage facilities while more men

desired diversifying their livelihood through seeking informal and formal employment as sources of income, incorporating trees on farm (agroforestry) and implementing soil and water conservation practices (Table 5). The statistical analysis revealed that the desired adaptation strategies were significantly different between men and women in Manafwa ($X^2 = 58.54$, $DF = 8$ P-Value = 0.037) and Kapchorwa districts ($X^2 = 78.72$, $DF = 8$ P-Value = 0.0003).

Table 5: Desired adaptation strategies in Manafwa and Kapchorwa

<i>Desired adaptation strategy</i>	<i>Percentage of respondents (%)</i>			
	<i>Manafwa</i>		<i>Kapchorwa</i>	
	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>
Diversify crop and livestock	94	96	87	90
Incorporating trees on farm (Agroforestry)	60	50	46	34
Changing planting dates	65	78	70	76
Implementing soil and water conservation practices	38	25	58	56
Livelihood diversification	84	73	77	69
Capital investment in agriculture	56	24	45	10
Rent agricultural land to increase crop production	53	44	61	35
Setting up non-based farm enterprises	10	8	120	7
Setting up food storage facilities	42	57	36	45

The currently adopted coping and adaptation strategies were significantly different from the desired adaptation strategies ($X^2 = 86.62$, $DF = 8$ P-Value = 0.002). Households mostly adopted immediate and short-term strategies (coping strategies) to address climate change rather than engaging in long term adaptive strategies in the present. This observation suggests that while households desired to make long term adjustments in their strategies to adapt to climatic changes, they are unable to due to a number of constraints thus their optimal choice for adaptation strategies is limited. Comparison between the actual and desired adaptation strategies shows that the desired strategies are more long term and may enhance the livelihoods of the households if adopted.



5. Discussion

Perception of vulnerability to climate change was found to be contextual and varied between men and women at both the community and household levels. PRA results revealed that there were significant overlaps in the claims on who was more vulnerable. Men opined that they were more vulnerable in comparison to the women; however, this opinion was contested by the women. Given these contestations, it therefore appears that vulnerability is experienced through gender roles and that it is likely that the accounts of the men and women on how changes in climate interact with their livelihood activities would be influenced by gender. Often, women are considered to be more vulnerable to change in climate than men (e.g. See Terry, 2009; Mitchell et al., 2007). However, in this study, results suggest that vulnerability to climate change may not be a straight forward concept and that the line between who is bound to be more vulnerable and therefore impacted most is not clear. Like Denton (2002) postulated, vulnerability to climate change is a gendered concept that is contested between men and women and associated with the socially constructed roles in particular communities. Men's vulnerability was associated with productive roles and the need for income whereas women attributed their vulnerability to multiple roles and the need to ensure food security. This finding further reaffirms that men and women will experience climate vulnerability differently because of the distinction in the work they do (Nelson et al. 2002; Brody et al. 2008; Twyman et al. 2014). The study therefore suggests that given that vulnerability is gendered, development of policies and climate adaptation programmes should take into account the gender differentiated roles of both men and women, such that policies and programmes may not have the unintended effect of actually increasing gender-based vulnerability.

The findings indicated that the perceived impacts of climate change were not significantly different between men and women. However, in certain contexts, there will be differences between men's and women's perceptions of climate shocks and climate change (e.g. Nelson et al. 2002; Twyman et al. 2014). It was further, observed that the men reported fewer impacts than what women reported. This could imply that, while men and women may be exposed to similar extremes of climate change, women may be more exposed to the impacts of climate change given the fact that they often bear the double burden of productive and reproductive activities (World Bank et al., 2009; McOmber et al. 2013). It is therefore argued that men and women should not be perceived as a homogenous group in respect to the impacts of climate change. Development of climate change adaptation strategies should take into considerations



the differences in perception of impacts in order to develop interventions that are gendered and enhance the resilience of both men and women to climate change. The findings on vulnerability to climate change deconstructs the debate postulated by many authors (e.g. Denton, 2002; Adger et al., 2007; Neumayer and Plumper, 2007; Quisumbing et al., 2008; Nellemann et al., 2011) that women are more vulnerable to climate variability. In this current study we find that the impacts of climate variability tend to be similar between men and women in general contexts, however, their perceptions of the magnitude of impacts differ. The findings therefore suggest that when developing adaptation strategies to address the impacts of climate change, development agencies and governments should not start with preconceived connections between identities (men and women) and vulnerability. Similar evidence is presented by Carr et al. (2016) who argues that generalizing identities hinder the ability to address the climate-related development and adaptation needs of the most vulnerable. We therefore suggest that, the design and implementation of effective gender-sensitive adaptation interventions should start with identifying the peculiar gender differences that shape people's livelihoods decisions and outcomes.

Households in the study area undertook different adaptation strategies in response to climate. These compare reasonably well with other adaptation strategies reported in other studies within Africa (e.g. see Below et al. 2010; Dressa et al. 2009; Boko et al. 2007). When the currently implemented adaptation strategies were compared with the desired adaptation strategies, it was found that household were rather coping with the climate changes rather than adapt. This finding corroborates observations by Bryan et al. (2009) which indicated that farmers did not adapt to climate change in the short run but used short term coping mechanisms. Similarly, Twyman et al. (2014) postulates that farmers mostly made simple adjustments in their bid to adapt to climate change. Households were rather responsive to climate change and did not adopt planned strategies. This could imply that household's choice of adaptation strategies could be constrained. Previous studies that have asked about desired strategies have found that farmers would like to make larger investments but are unable due to a number of constraints (e.g. see Bryan et al. 2009). Engagement in short term strategies was attributed partly to lack of financial resources needed to catalyse their transition to new adaptation strategies or due to the fact that they lack knowledge on improved adaptation measures. Given that households are involved in short term coping strategies but have a desire to implement long term adaptation strategies, we argue that the government and other development agencies involved in promoting climate adaptation in the region should build the capacity



of the local communities to enhance their ability to adopt longer term interventions than enhance their resilience to shocks.

Men and women demonstrated different preferences for coping and the desired adaptation strategies. This finding suggests that the strategies for coping with climate change could have a strong gender component that could be exacerbated by differential gender roles. Lambrou and Nelson (2010) and FAO, (2010) note that men and women may have distinct coping/adaptation strategies and responses because of their distinct socially constructed gender roles, responsibilities, status and identities. Women were more devoted to the measures of adaptation that were less capital intensive, required less labour and enabled them secure food security for their households while men were more devoted to the adaptation measures that enabled them earn more income to sustain their families. This finding reaffirms results by Swai et al. (2012) who opined that adaptation practices undertaken by men and women are biased towards their gender differentiated roles. Women also focused on fewer strategies as compared to men due to limited financial resources and labour requirements for making adjustments. It thus appears that adaptation adjustments in farming households occur within existing gender roles.

While adaptation to climate change is location specific, the current climate adaptation strategies undertaken by the Ugandan government under different ministries are broadly focused (Kansiime, 2012) not specific to address the distinct local contexts of climate change. Therefore, as the country embarks on combating the impacts of climate change through development and promotion of adaptation interventions as spelt out in the national development plan-II and the climate change policy, there is need to take into consideration of the peculiar gender differentiated perceptions and experiences at the local/community levels. That is, these may raise important disparities in gender that adaptation planning needs to take care of in order to realize the desired socio-economic impact. The adaptation strategies should be particularly contextualized to local conditions that shape vulnerability to climate change.



6. Conclusions and recommendations

This study presents evidence regarding gender differences in perceptions of climate change, vulnerability, impacts, as well as adaptation to climate change in Uganda. It can be concluded that; (i) Vulnerability to climate change is contextual and varies between men and women with a contestation on who is bound to be affected more. (ii) While the impacts of climate change may be similar between men and women in general contexts, their perceptions of the impacts could be different. (iii) Men and women are adopting a number of practices for adapting to climate change; however, these are short term and may make them more vulnerable in advent that climate stresses continue.

These results from this study have significant policy implications for household level climate change adaptation. This study has shown that gender plays a significant role in shaping vulnerability and adaption strategies. The study therefore strongly suggests that (i) Adaptation planning and design of adaptation projects should take into account both men and women's perspectives of vulnerability and gender roles; (ii) The responsible government agencies should identify and promote sustainable location-specific adaptation strategies that are tailored to gendered norms of the region in order to enhance the households resilience to climate change.

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