

Abstract

Climate change is a global issue posing challenges to mankind's sustainable development. It is mainly caused by greenhouse gases emission in the atmosphere. Greenhouse gases, land degradation through agriculture and deforestation, contribute to climate change at large. In small scale farming, majority are women who suffer most because of small landholdings and lack of resource to cope with climate change. Thus, their participation in climate change adaptation and mitigation sound essential. The body of decision making does not involve women in climate change adaptation strategies, men do participate in all agenda of climate changes.

The study had the following objectives

- Assess awareness levels among women who are maize smallholder farmers on the climate change challenges
- Examine the perceived effects of climate change on maize farming activities among smallholder farmers
- Analyse climate change mitigation and adaptation measures in place
- Assess community behaviours on climate change adaptation and mitigation

This study was guided by the theory of change and post-marxist approaches to political ecology theory. The theory of change is a specific methodology for planning, participation and evaluation that is used in the charity, non- profit and government sectors to promote social change. Dependent variable in this theory is participation whereby it acknowledges that any change requires wide participation of stakeholders who are affected by the program. Independent variables from this theory include awareness which is assumed to influence women participation in climate change mitigation and adaptation. Intervening variables include institutional factors such as laws and policies which are also assumed to influence changes in adaptation and mitigation practices.

Post- Marxist approaches to political ecology includes feminist and post-structuralism perspectives. The key premise of this approach is that gender relations are pivotal for explaining human nature relations and understanding the issue of access to and control over resources and their conservation. In relation to this theory women participation is seen to be important because they are primary produce, hence, they are largely affected by climate change on maize production.

The study adopted a cross-sectional design, the design allowed respondents to be interviewed at a single point in time. A cross-sectional design was also preferred as it supports a variety of analytical techniques including quantitative and non-quantitative analyses.

- Open-ended and closed- ended questionnaires were administered to women maize smallholder farmers to get quantitative data. Village leaders helped the researcher to identify households which are

headed by women and to identify women who own land and practice maize farming without their husband's interference.

- Interviewed women respondents included only smallholder farmers whereby maize was the dominant crop produced. On that, the sample size was 99 women who has small maize farms. The sample size was randomly selected from five villages as indicate in Table 8

Table 8: Stratified random sampling with proportional allocation

S/N	Village	Number of women smallholder maize farmers in Village stratum (Estimated)	Proportionate sample size
1.	Sanya Station	1850	$99/7567*1850=24$
2.	Mtakuja	1000	$99/7567*1000=13$
3.	Kikavu Chini	1350	$99/7567*1350=18$
4.	Mkalama	1437	$99/7567*1437=19$
5.	Kawaya	1930	$99/7567*1930=25$
	Grand Total	7567	99

Data were analyzed using descriptive statistics using a Likert scale, a paired samples t- test and multiple response analysis with the aid of IBM SPSS and Microsoft Excel. Qualitative data were presented in terms of quotations and cases whereas quantitative data are presented in terms of tables, graphs and charts.

The study revealed the following findings: -

- The results indicated that all farmers (100%) were aware of climate change. Some of the respondents had low awareness on climate change challenge indicators and causes while the rest were highly aware on climate change effects.
- The study indicated that there was decline in weed influx and hence weeding frequency, importantly decline on soil productivity. Further, there was no mean difference on land size cultivated by women.
- The major sources of climate related information were own observation, radio and village leaders.
- Despite the fact that women were adapting to the changing climate, adaptation measures did not bring required results as majority of women claimed that there is decline in maize output this may be due to the fact that women missed technical advice from experts especially extension officers on how to efficiently and effectively use those adaptation and mitigation measures.
- In assessing adaptation and mitigation measures adopted by respondents, 92.9% of the respondents were adapting to changing climate in one way or another.
- Climate change had caused decline in vegetation cover from thick to either medium or thin. There were also changes in time of clearing land, changes in maize varieties planted from local seeds to modern

seeds, increase in mean fertilizer use and increase in mean pesticide use.

Conclusively, women who own small maize farms disagreed on the most of positive statements which measured the governance and leadership and the ability of community to reorganize in solving various climate change challenges. This means that there is poor governance and leadership as well as low ability of community to reorganize in relation to climate change related issues. For that, community behaviours on climate change in the study area does not support women participation in climate change adaptation and mitigation.

Recommendations

- Local leaders, extension officers and other social groups and non-governmental organizations should make efforts to train farmers especially women to raise their awareness levels on climate change indicators, causes, effects in order to enable them to deal with the challenge.
- Village leaders are recommended to arrange frequent trainings to enable them to get enough knowledge and skills concerning climate change adaptation and mitigation strategies. Also, Extension officers at the local government level should provide technical advice to women through dissemination of information on climatic changes concerning better mitigation and coping strategies to maintain soil fertility.
- Women maize farmers should be given support from government leaders and village extension officers on how to deal with climate change effects. Support may include provision of farm inputs like fertilizers, pesticides as well as seeds and credits.
- It is recommended that community members should be able to coordinate various activities cooperatively to respond quickly to climate change impacts like cooperating to rebuild houses damaged with strong winds, rebuilding roads destroyed by floods and helping community members' farms destroyed with rainfall.

