

PERCEPTION OF CLIMATE CHANGE IMPACTS AMONG WOMEN FARMERS IN ILOPIN SOUTH LOCAL GOVERNMENT AREA OF KWARA STATE, NIGERIA

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ABSTRACT

The study analyzed the perception of women farmers on the impact of climate change in a rural part of Kwara state, Nigeria. The main objective is to identify from the farmers' perspectives the causes of climate change and its effects on their agriculture and the coping strategies adopted. A sample of 120 farmers comprising of 20 women per settlement spread over 6 villages was purposively selected. Mean and percentages were employed to provide a quantitative summary of the responses. Occupational distribution showed that most of the respondents (about 53%) are part time farmers. The perception of the causes, consequences and control of climate change vary according to the agricultural practices adopted by farmers. Out of all the farmers practising mono cropping, 52%, 20% perceived natural phenomenon (too much rainfall and drought) and god's indignation to be the main causes of climate change while 13.2% associated it with various anthropogenic activities. Similarly 48.4%, 23.1% and 28.4% of farmers involved in mixed cropping attributed climate change to natural phenomenon, god's anger and activities of man respectively. Different coping strategies were adopted by women farmers to mitigate the adverse effect of climate change on crops include prayer/Alms and replanting(51% and 45%) for surplus rainfall, mulching / shading, replanting and irrigation(46% , 25% and 19.1%) for drought . A wide gap exists between the indigenous knowledge on climate and the scientific position about climate change. The need to at least narrow the gap if not bridged was emphasized

Key words: Climate Change, Perception, Women Farmers, Mitigation, Rural areas.

INTRODUCTION

Women form one-half of adult population, one-third of official labour force and perform two-thirds of the world's working hours (Carew, 1982). In spite of this, women constitute the majority of the poor, the underemployed, economically and socially disadvantaged (Okeke, 2004). In order to make ends meet, rural women interact so closely with their environment in the area of food production and processing. For instance, studies (e.g. Saito, 1994) have shown that Nigeria women put in much longer hours on farming activities than men and hence more likely to be conscious of changes that take place in their farm environment than their men counterpart. Prominent of such are changes in climate as it affects their farming activities.

Climate change has been defined as a change in climate attributed to human activity that alters the composition of the global atmosphere and, in addition to natural climate variability observed over comparable time periods (UNFCCC 1992; Adefolalu 2006). Man's activities have increased the GHG emissions and thus the temperature of the world. It has been proved that

climate change has serious implications on rain-fed agriculture in the tropics (Adefolalu, 2004). Such implications include inadequate rainfall resulting in poor crop yields in some areas and too much rain causing several hectares of farm land flooded.

Various scientific efforts which include understanding adaptation of specific crops to climate change, have also been adopted by different groups of people to salvage economic activities of man from climate change menace (Shyam et al 2011). It is therefore crucial to exploit the wealth of indigenous knowledge of the farmers to achieve similar goal for agriculture. Ejeh et al (2011) and Ayeni et al (2011) among others conducted such study. Ejeh, et al (2011) examined local farmers' perception and response to climate change in Sumaila LGA of Kano State. Climate change events such as drought and agricultural pest were perceived by both male and female farmers as major climate related hazards. Again, Ayeni et al (2011) studied climate change, perception, adaptation and mitigation and suggested possible solutions with a view to mitigate the effect of the climate change on man's environment.

From time immemorial farmers have made day to day decisions from their wealth of experiences with at least 'one eye' on the weather. Such conscious decisions are made in order to avert or at least limit the menace of climate on agriculture. Thus the present study focuses on the perception of women farmers in rural areas about the impact of climate change on agricultural practices and production. The study also examines the various coping strategies put in place to mitigate the negative impact of climate change.

STUDY AREA

In the pursuance of the aim of this study, rural women farmers in Ilorin South Local Government Area of Kwara State were chosen as the focus of study. The study area lies between latitude $8^{\circ} 30'N$ of the Equator and longitude $4^{\circ} 25'E$ of the Greenwich Meridian (Figure 1). It has the tropical climates which exhibit a definite wet and a marked dry season in response to the pressure pattern resulting in the seasonal shifts of pressure belts associated with the apparent movement of the overhead sun. Air temperature is high throughout the year, mean monthly maximum temperature ranges between $29.2^{\circ}C$ in the month of July to $37^{\circ}C$ during the month of March (Olanrewaju, 2012). The study area is covered by ferruginous tropical soil of a sandy surface horizon underlain by a weakly developed clayey mottled. The vegetation is savanna. These characteristics make farming the major occupation of the people with yam, cassava, maize and guinea corn as the major crops grown (Olanrewaju, 2003).

MATERIALS AND METHODS

There is no known population of women farmers in the area, thus a sample of 120 farmers was purposively selected in a fashion comprising of 20 women per settlement. These women were specifically those that owned separate farms apart from that of their husbands. Information was obtained using questionnaires. Data on socio-economic status, climatic variation, yield variation, past experiences about agricultural impact of climate change, farming practices and various adaptive measures put in place towards climate change impact were collected. The Local Government Area comprises eleven political wards of both rural and urban settlements.

However, for this study the concern is on the rural settlements because they are involved in farming activities just as rural men. Thus, Akanbi district was selected which is predominantly rural ward. There are eleven rural settlements in the study area out of which six were randomly selected. These are settlements with less than 5,000 dwellers. The sampled villages are Baba, Isoku, Fufu, Omode, Joromo-Oyun and Aiyereke Ile. These are areas where farming is the major occupation of most men and women ((Omoloso 2009). Mean and percentages were employed to provide the quantitative summary of the respondents. These were tabulated and presented in the form of frequency tables.

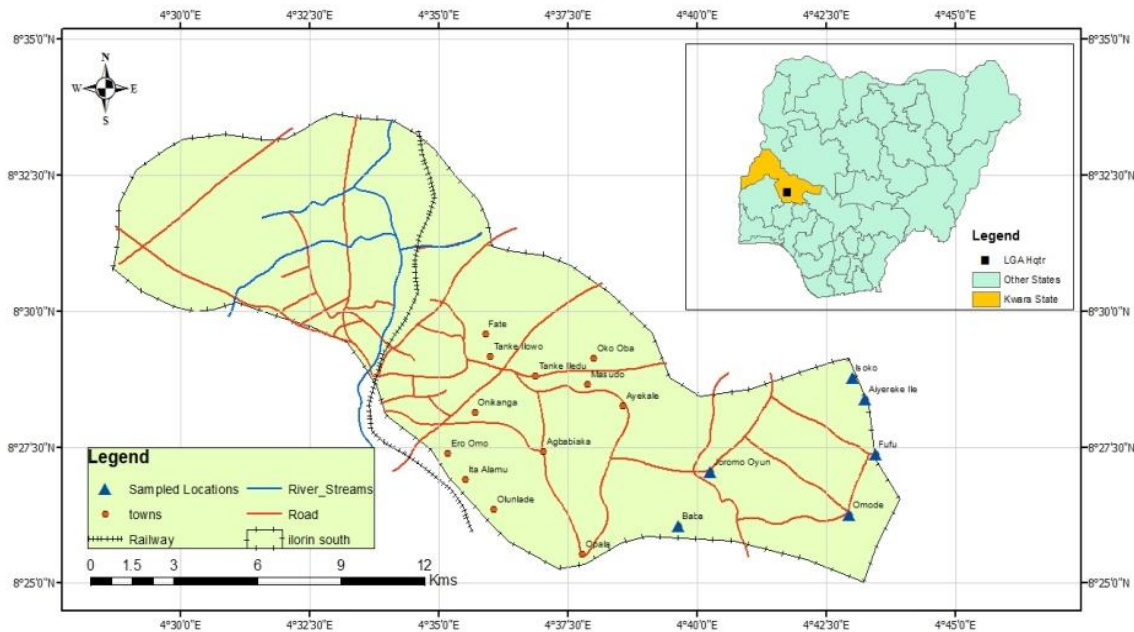


Figure 1: The Study Area.

RESULTS AND DISCUSSION OF FINDINGS

Demographic Characteristics of Women Farmers

Table 1 shows various demographic characteristics of the female farmers in the rural areas of Ilorin South LGA. Majority of the respondents sampled fall within the active age groups of 31-30 and 31-40 years. About 66% of these women were married and about 38% have no formal education.

Occupational distribution showed that most of the respondents are part time farmers (53.3%) while about 47% claimed to be full time farmers. This is in agreement with Olatunde (2004) that women involved in farming either as major or secondary occupations and that they all operated at subsistence and meager scales.

Table 1: Demographic Characteristics of Respondents

Characteristics	Frequency	Percentage distribution
Age group (year)		
21 – 30	49	40.8
31 – 40	47	39.1
41 – 50	23	19.1
51 – 60	1	0.8
Marital Status		
Married	78	65.5
Divorced	11	9.1
Widowed	31	25.8
Educational Status		
No formal education	45	37.5
Adult education	15	12.5
Primary education	27	22.5
Secondary education	21	17.5
Post secondary	12	10
Occupational Status		
Full time farmer	56	46.6
Part time farmer	64	53.3

Source: Author’s Field Survey, 2009

Perception of the Women Farmers on the Causes of Climate Change

Causes of climate change as perceived by women farmers under different farming practices are shown in Table 2.

Table 2: Opinion of Respondents on causes of climate change under two farming practices

Farming practices	Causes of Climate Change							
	Natural phenomenon		God’s indignation		Anthropogenic activities		Freq. total	% total
	Freq.	%	Freq.	%	Freq.	%		
Mono cultural	13	52	5	20	7	13.2	25	20.8
Mixed cropping	46	48.4	22	23.1	27	28.4	95	79.2
Total	59		27		34		120	100

Source: Author’s Field Survey, 2009

Opinions of farmers under different farming practices about the causes of climate change varied. Twenty five out of the 120 farmers sampled practiced mono-cropping out of which 52% percent believed that climate change is a natural phenomenon, 20% held to the opinion that climate change resulted from an act of God to reprimand and check human race of their wickedness, while 28% attributed climate change to effect of various human activities. Among 95 farmers who practiced mixed cropping, about 48 percent believed that climate change is caused by natural phenomenon such as rainfall, temperature etc , 23% perceived it as due to the anger of God and about 28% saw it as induced by man

The opinions of the women farmers above indicate that women farmers also have local knowledge of describing climatic events around them. This confirms the findings of Atteh (1984), that indigenous farmers have a wealth of knowledge about their environment. Based on these responses causes of climate change can be arranged in order of importance with natural phenomenon ranking first, anthropogenic activities next and God's act as the last in the category. It is important to note this ranking has implication for climate change mitigation and reduction of its impact. This is because anthropogenic factors are the strongest causes of climate change whereas the women believed that climate change is first a natural phenomenon, over which there is no control. Thus, mitigation and adaptation solutions may not be taken seriously by the people.

To further elicit information on the level to which rural farmers appreciate the impact of climate change on their agricultural activities history of crop yield performance over the periods of fifteen years (of three five year periods) was examined (see table 3).

Table 3: Respondents opinion on crop performance across decades

Crop yield performance	1994-1998		1999-2003		2004-2008	
	Freq.	%	Freq.	%	Freq.	%
Very good	90	75	23	19.2	12	10
Normal	18	15	37	30.9	22	18.3
Poor	9	7.5	60	50	31	67.5
Indifferent	3	2.5	-	-	5	4.1
Total	120	100	120	100	120	100

Source: Author's Field Computation, 2009

Majority of the respondents (75%) described the period of 1994-1998 as period of very good yield while the periods of 1999-2003 and 2004-2008 were seen as period of poor yield. Women farmers of the study area were asked to give reasons for the poor yield experienced in various crops during the periods that witnessed poor crop yield (table 4). The three reasons in table 4 are not mutually exclusive. For instance, climate change may aggravate incidence of pests and diseases and make weeds uncontrollable to the farmers

Opinions varied as to the reasons for the poor yield over various crops. Farmer believed that yam (51%) maize (58%) and melon (82%) were worst affected by decline in rainfall amount, late onset and early cessation of rain coupled with high temperature while pests and diseases ranked next. Cassava and guinea corn were least affected by deteriorating climate while melon crop was least affected by weed. This is not surprising because cassava is known to be drought resistant (Carter et al, 1997) while melon plant creeps over weeds to suppress its development (Olanrewaju, 2003)

Table 4: Reasons for the poor yield of each crop

Reasons	Yam		Cassava		G. corn		Maize		Melon	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Deteriorating climate	51	51	18	18	11	11	58	58	82	82
Pest and diseases	39	39	40	40	13	13	37	37	32	32
Weed	10	10	42	42	76	76	15	5	6	6
Total	100		100		100		100		100	

Source: Author's Field Survey, 2009

The opinion of the respondent was also sought on the most crucial climate factors to crop production in the study area (see Table 5). About 56% of the respondents believed that rainfall is the most crucial climate factors of crop production in the study area and about 33% perceived temperature as most crucial. This conclusion tallied with the findings of Ayoade (2004) that the determinant factors of agriculture in the tropics are rainfall and temperature..

Table 5: Opinion of Respondents on Climatic Factors crucial to Crop Production

Factors	Responses	
	Freq	%
Rainfall	67	55.8
Heat (temp)	39	32.5
Wind	10	8.4
Relative Humidity	4	3.3
Total	120	100

Source: Author's Field Survey 2009.

Table 6: Opinion of the Respondents on the most Important Rainfall Characteristics

Rainfall characteristics	Severely Melon		Affected Yam		Crops	
	Freq	%	Freq	%	Freq	%
Too much	34	28.3	21	17.5	26	21.6
Too little	28	23.3	30	25.0	33	27.5
Late onset and early cessation	55	45.8	35	29.1	37	30.8
late onset and late cessation	10	8.3	6	5.0	4	3.3
Early onset and early cessation	12	10	28	23.3	14	11.6
Total	5	4.1	0	0	6	5.0

Sources: Author's Field Survey 2009

Since majority of the respondents perceived rainfall to be the most important climate factor that determined crop performance in the area, respondents were asked to described the rainfall characteristics that resulted in poor yields of the severely affected crops (see table 6).

Respondents believed that severity of climate change impact on agriculture is manifested most in late onset and early cessation of rain. For instance, about 46%, 21% and about 31% of the respondents attributed poor yield perceived in melon, yam and maize to this rainfall characteristic. Again the above finding is in line with Bello (1983) and Olanrewaju (2003) that the amount of rainfall receives is not as important as its spread for crop to perform well. Next to the above is too little rainfall. For instance about 28% of the respondents associated the level of severity suffered by melon to too little rainfall while about 18% and 22% have similar opinion for yam and maize respectively.

Coping Strategies Adopted by the Respondents

Various adaptation measures employed by the respondents to cope with various climate vagaries are depicted in Table 7. Majority of the respondents result to prayer (about 52%) and replanting (45%) to cope with the menace of too much rain. Adaptive measures put in place for too little rain include mulching and shading (38.3%), prayer/alms (32.5%), replanting (25%) and irrigation (19.1%). Late onset and early cessation of rain connotes short growing period.

Table 7: Coping strategies adopted by respondents

Rainfall characteristics	Prayer/Alm		Mulching / shading		Replanting		Changing varieties		Increasing Cultivated area		Irrigation	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Too much rain (flood)	62	51.6	2	1.6	54	45	2	1.6	0	0	0	0
Too little rain (drought)	39	32.5	46	38.3	30	25	1	0.83	0	0	23	19.1
Late onset and early cessation	77	64.1	2	1.6	37	30.8	1	0.83	0	0	5	4.1
Too much heat	85	70.8	5	4.1	2	1.6	5	4.1	0	0	3	2.5

Source: Author's Field Survey, 2009

To cope with this, about 64% of the respondents resolved to prayer and alms, about 31% practiced replanting while only 4.1% practiced irrigation. When there is too much heat majority of female farmers (about 71%) adopt the strategy of prayer and alms.

RECOMMENDATIONS AND CONCLUSION

The focus of this study was the analysis of the perception of women farmers on the impact of climate change in a rural part of Kwara State Nigeria. The study shows that perception of the causes, consequences and control of climate change vary according to the agricultural practices adopted by women farmers. Importantly, when taken on the aggregate, the causes of climate change as identified by the rural women contradict some of the scientific understanding. Despite this, the study shows that women farmers adopted different strategies as coping strategies to mitigate the adverse effects of climate change on the crops. They also have such different strategies for the different experiences of harsh weather they may face.

Finally, perhaps because of their belief on the perceived causes of climate change, women farmers also adopted various unorthodox approaches during extreme weather events. These include prayer and alms giving to reduce the effects of extreme weather conditions on their crops.

In conclusion, although the scientific understanding on the causes, consequences and control of climate change is clear, this knowledge is not available to the local people as they possess their own opinions about weather and climatic changes. These opinions are in some cases different or even contradictory to scientific opinions about climate change understanding. Using the example of rural women farmers, it has been demonstrated that a wide gap exists between the lay peoples' knowledge on climate and environmental change and the scientific position about the change.

Mitigation efforts will be more meaningful when local people also accepts the established scientific facts about climate change. This is because as shown in this study, local women farmers have poor understanding of the causes and impact of climate change as their ideas are largely at variance with the well established scientific facts in the literature which may affect the efficacy of mitigation and sustainability of adaptation strategies. This is so because all measures developed by science and implemented by policy makers must eventually found expression in the daily life of local people both in rural and urban places. In this light it is suggested that there must be increased engagement of the mass media for the purpose of climate change risk

communication. The study is thus useful in the understanding of the knowledge gap between science, policy and daily life as relates to climate change.

The policy implication of the study include the fact that agricultural sector will benefit immensely from climate sensitive rural agricultural policy. The rural communities must be given the opportunity to expose their knowledge perimeter on climate change with a view to fine tuning their perception and belief system on climate related risks affecting agricultural practices and production.

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